


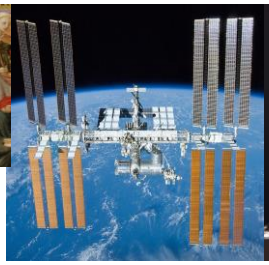


TEXAS SCIENTIFIC ITALIAN COMMUNITY

SHRO SBARRO HEALTH RESEARCH ORG.

In Collaboration With:

College of Science and Technology TEMPLE UNIVERSITY

Temple University Rome

XVII CONFERENCE OF ITALIAN RESEARCHERS IN THE WORLD

PHILADELPHIA ~ APRIL 1, 2023

Senato della Repubblica

Camera dei Deputati

Ministero degli Affari Esteri e della Cooperazione Internazionale

Embassy of Italy Washington

Consulate General of Italy Philadelphia

Consulate General of Italy Houston

Istituto Superiore di Sanità

ENEA Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

C I G E

ARIM

AAIIC 中国意大利学者协会 ASSOCIAZIONE ACCADEMICI ITALIANI IN CINA

CALIFORNIA SCIENTIFIC ITALIAN COMMUNITY

MIAMI SCIENTIFIC ITALIAN COMMUNITY

RÉSEAU DES CHERCHEURS ITALIENS EN FRANCE – RETE DEI RICERCATORI ITALIANI IN FRANCIA

Message from the Conference Chairman

Desidero salutare tutti i partecipanti alla XVII Conferenza dei ricercatori italiani nel mondo.
Ringrazio il Rettore Mandel, la Temple University, il Prof. Antonio Giordano presidente della Sbarro Health Research Organization assieme al suo staff per l'ospitalità, ed il Prof. Andrea Giuffrida presidente della Texas Scientific Italian Community.

Anche quest'anno l'iniziativa presenta carattere e rilevanza internazionale, ricevendo i patrocini ed il sostegno morale dalle più alte istituzioni Italiane, e i messaggi letti e rivolti ai partecipanti grazie alla presenza della Console generale d'Italia a Philadelphia Cristiana Mele, ne sono la dimostrazione.
Dalla Presidenza del Senato, alla Camera dei Deputati, alla Presidenza del Consiglio dei Ministri, al Ministero dell'Università e Ricerca, al Maeci, all'Ambasciata d'Italia a Washington, all'Istituto Superiore di Sanità, all' Enea e al CGIE.

L'evento odierno coincide nel mese della nascita di uno dei più grandi inventori e geni al mondo, uomo universale e simbolo del rinascimento, Leonardo Da Vinci (15 Aprile 1452), ed in occasione di tale anniversario, da qualche anno si celebra anche la giornata della ricerca italiana nel mondo promossa dal Ministero dell'Università e della Ricerca, dal Ministero degli Affari Esteri e della Cooperazione Internazionale, e dal Ministero della Salute.

Esprimo soddisfazione per la presenza di ricercatori italiani che operano in varie parti del mondo, dal Brasile, alla Cina, dall'Europa al Messico e Stati Uniti, con una elevata qualità e numero di presentazioni che confermano la straordinarietà di questo evento, nelle varie tematiche dall'aerospazio, alla medicina, dalle steam, all'umanistica.

Ritengo inoltre, fondamentale, il ruolo delle associazioni dei ricercatori italiani all'estero. Bisognerà lasciare una traccia a seguito di questa giornata. Assieme con i vari partners di categoria, abbiamo iniziato un cammino, e vi prometto che lanceremo entro quest'anno, l'Assemblea degli Stati Generali, e poi porteremo avanti una proposta istituzionale e di coordinamento per poter creare una strategia e fare sinergia con la pubblica amministrazione per contribuire a promuovere il sistema Italia nel mondo, auspicabilmente in modo concreto.

E se il futuro di una nazione dipende dagli investimenti in innovazione e ricerca, la manifestazione di oggi rappresenta anche a se in forma gratuita, l'impegno e la continuità, un modo consolidato per incrementare il networking dei ricercatori e il dovuto riconoscimento, per far comprendere, a tutti i livelli dei settori pubblici e privati, che la comunità dei ricercatori italiani nel mondo è una grande risorsa per l'Italia.

Con la stima di sempre, Auguri di buon lavoro

Vincenzo Arcobelli

Antonio Giordano, XVII Conference Executive Director

In qualità di direttore della XVII Conferenza dei Ricercatori Italiani nel Mondo che si tiene presso la Charles Library della Temple University di Philadelphia (USA) sono veramente lieto di accogliere e di dare il benvenuto alle autorità, ai relatori e ai partecipanti tutti. Ringrazio, quindi, il Rettore della Temple University Gregory N. Mendel; il Vice Rettore della Temple University, Emilia Zankina; il Presidente della comunità' Scientifica italiana del Texas, Andrea Giuffrida; il Console italiano a Philadelphia, Cristiana Mele; il Chairman della Conferenza, Vincenzo Arcobelli ed il Presidente dell'Istituto della Sanità, Silvio Brusaferro.

Ho tenuto molto alla realizzazione di questo convegno per dare modo ai giovani ricercatori, provenienti da tutto il mondo, di illustrare i loro progetti scientifici ed umanistici, consapevole che le diverse discipline dialogano tra loro, integrandosi continuamente.

Ringrazio, quindi, tutti i relatori per la dedizione e la passione per la ricerca scientifica che ha consentito loro di superare barriere geografiche e culturali nel tentativo di contribuire alla ricerca sul cancro e, soprattutto il dottor Andrea Morrione, Direttore del Programma di trasduzione del segnale dei meccanismi molecolari del cancro presso lo Sbarro Institute for Cancer Research and Molecular Medicine, che ha moderato la sessione sulle cellule staminali e che ha voluto sottolineare come i progetti della SHRO tendano a coprire i diversi aspetti della ricerca sul cancro e per fornire nuovi elementi per identificazione di nuovi bersagli per la terapia.

As Director of the XVII Conference of Italian Researchers in the World, held at the Charles Library of Temple University in Philadelphia (USA), I am truly pleased to welcome all the speakers and participants. I would like to thank the Provost of Temple University, Gregory N. Mandel; the Dean and Interim Vice Provost for Global Engagement at Temple University, Emilia Zankina; the President of the Italian Scientific Community of Texas, Andrea Giuffrida; the Italian Consul General of Philadelphia, Cristina Mele; the Chairman of the Conference, Vincenzo Arcobelli and the President of the Italian Institute of Health, Silvio Brusaferro.
I have been very keen on the organization of this conference to give young researchers from all over the world the opportunity to showcase their scientific and humanistic projects, as I firmly believe that different disciplines dialogue with each other and continuously integrate.
I sincerely thank all speakers for their dedication and passion for scientific research, dedication that has allowed them to overcome geographical and cultural barriers to contribute to cancer research. Above all, I would like to thank Dr. Andrea Morrione, Director, Molecular Mechanisms of Cancer Signal Transduction Program at the Sbarro Institute for Cancer Research and Molecular Medicine, who moderated the session on stem cells and emphasized on how SHRO projects cover different aspects of cancer research and to provide new elements for identifying new targets for therapy.

SBARRO HEALTH RESEARCH ORGANIZATION

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Andrea Giuffrida, PhD, MBA
President, Texas Scientific Italian Community

Vice President for Strategic Industry Ventures
The University of Texas Health Science Center San Antonio

I am very honored to welcome all of you to the XVII Conference of Italian Researchers in the World sponsored by the Texas Scientific Italian Community (TSIC) and the Sbarro Health Research Organization.

I would like to thank Temple University, its Provost, Dr. Gregory Mandel and Dr. Antonio Giordano, Director of the Sbarro Health Research Organization, for their invaluable support and for hosting the event on their beautiful campus in Philadelphia.
I am also very grateful for the endorsements received by many representatives of Italian government entities - ranging from Anna Maria Bernini, Minister of University and Research, Prof. Silvio Busaferro, President of the Istituto Superiore di Sanita', and Cristiana Mele, Consul General of Italy in Philadelphia – and numerous national and international organizations including the Miami and California Scientific Italian Communities, the Association of Italian Scholars in China, the Network or Italian Researchers in France (RECIF), and the Association of Italian Researchers in Mexico, to name a few.
These endorsements confirm the prestige that this conference has reached over the years by creating a remarkable platform for scientific exchange among scientists, as well as an opportunity to recognize and celebrate the scholar activity and the tremendous impact of Italian scientists at home and internationally.

It is so exciting to see so many speakers sharing with us the highlights of their research journeys, the outstanding technological and scientific developments, and the deep connections and collaborations with our country of origin spanning across multiple disciplines discussed in 4 main sessions: Aerospace, Medicine, STEAM (Science, Technology, Engineering, Arts and Mathematics) and Humanities.

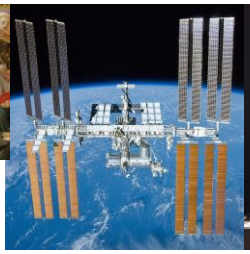
A big kudos to Chairman Vincenzo Arcobelli and the entire organizing committee for compiling such an impressive agenda and for offering a live streaming of the conference on the TSIC Facebook page to facilitate attendance and participation.

I give all participants my best wishes for their professional careers.

With great respect and admiration,

Andrea Giuffrida, PhD, MBA




TEXAS SCIENTIFIC ITALIAN COMMUNITY

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Senato della Repubblica
Il Presidente

XVII CONFERENZA DEI RICERCATORI ITALIANI NEL MONDO

Philadelphia, 1° aprile 2023

Messaggio del Presidente del Senato

E' con grande piacere che invio il mio saluto personale e del Senato della Repubblica in occasione della XVII "Conferenza dei ricercatori italiani nel mondo".

La forte partecipazione di tanti ricercatori italiani provenienti da ogni area del mondo e in rappresentanza di tutti i settori della ricerca e dell'innovazione, dalla medicina alle materie umanistiche, dall'ingegneria alla fisica all'aerospazio, conferma come il vostro appuntamento sia diventato a tutti gli effetti un punto di riferimento per l'intera comunità scientifica internazionale.

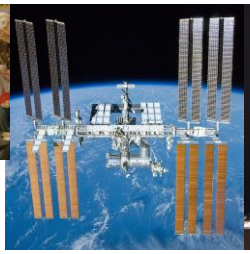
In tale cornice, guardo anche alla promozione della giornata della ricerca italiana nel mondo da parte del Ministero dell'Università e della Ricerca, del Ministero degli Affari Esteri e della Cooperazione internazionale e del Ministero della Salute, nella convinzione che essa possa tradursi in una preziosa opportunità per promuovere e sostenere con orgoglio, anche in ambito istituzionale, le proposte, le esperienze e le capacità di tanti nostri ricercatori.

Il prestigio ed il valore di tanti italiani impegnati in tutto il mondo in attività di alto valore scientifico, sociale e culturale costituisce infatti una ricchezza irrinunciabile per la nostra Nazione e per il ruolo che essa deve ricoprire in tutti i consessi internazionali.

Rinnovo quindi i miei auguri per i vostri lavori congressuali, nella certezza che sapranno essere crocevia di nuove idee, prospettive progetti in un percorso di sviluppo, innovazione e progresso che abbiamo il dovere di costruire insieme.

Ignazio La Russa




TEXAS SCIENTIFIC ITALIAN COMMUNITY

SHRO SBARRO HEALTH RESEARCH ORG.

Il Presidente della Camera dei Deputati

Segreteria del Presidente
PARTENZA 31 Marzo 2023
Prot: 2023/0000323/PRESC

Vincenzo Arcobelli
Chairman XVII Conferenza
Ricercatori Italiani nel Mondo

Rivolgo un cordiale saluto a tutti i presenti alla XVII Conferenza dei Ricercatori Italiani nel Mondo e un particolare ringraziamento alla Comunità Scientifica Italiana in Texas, che quest'anno ha organizzato tale iniziativa a Philadelphia in coincidenza con la Giornata della ricerca italiana nel mondo.

Il vostro impegno nelle università e nei centri di eccellenza attesta il rilevante contributo italiano al generale avanzamento della ricerca scientifica. Dimostra altresì, ancorché in via indiretta, che il nostro modello di formazione non ha nulla da invidiare a quello dei Paesi più avanzati in questo settore.

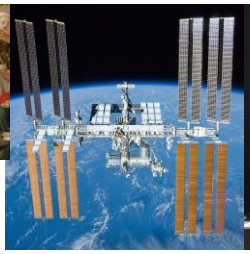
Estremamente apprezzabile è il vostro sforzo proteso a favorire gli interscambi e le sinergie tra l'Italia e i Paesi in cui lavorate, creando opportunità di collaborazione e di arricchimento reciproco.

Ritengo, quindi, che tutti gli italiani debbano avere piena consapevolezza della valenza dei nostri ricercatori che lavorano all'estero, circa trentatremila, e del ruolo che essi svolgono per la promozione ai più alti livelli dell'immagine dell'Italia.

Compito della politica e delle istituzioni è di creare le condizioni affinché tali relazioni si intensifichino e di facilitare il rientro in Italia di tutti coloro che lo desiderino.

D'altronde, lo stesso successo economico di una nazione è proporzionale agli investimenti in cultura e ricerca scientifica. Da questo punto di vista, l'Italia accusa un ritardo che va assolutamente colmato, ponendosi agli ultimi posti nella classifica della spesa pubblica per istruzione e ricerca.

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Il Presidente della Camera dei Deputati

Occorre invertire la rotta. Lo dobbiamo alle giovani generazioni e a tutti voi che continuate a mantenere legami non solo di affetto con il vostro Paese di origine.

Nella certezza che il vostro impegno continuerà a essere proficuo per la comunità scientifica e per l'Italia tutta, vi auguro buon lavoro.

Lorenzo Fontana

MESSAGGIO DI SALUTO

MINISTRO DELL'UNIVERSITA' E RICERCA, SEN. PROF. ANNA MARIA BERNINI, IN OCCASIONE DELLA XVII EDIZIONE DELLA "Conferenza dei Ricercatori Italiani nel Mondo"

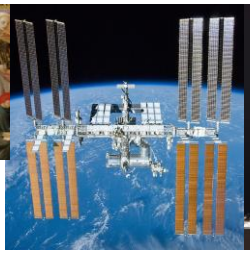
È con grande piacere che rivolgo il mio saluto a tutti i relatori e partecipanti alla XVII edizione della Conferenza dei "Ricercatori Italiani nel Mondo" che si svolge quest'anno a Filadelfia, Pennsylvania.

Come Ministro dell'Università e della Ricerca, fin dall'inizio del mio mandato ho voluto dare massima attenzione al rapporto con i nostri connazionali che sono impegnati in fondamentali attività di ricerca all'estero. Il vostro apporto è particolarmente prezioso per l'avanzamento della ricerca e del sapere nei vostri diversi campi di attività, ma anche perché contribuite in maniera determinante al profilo internazionale dell'Italia, non solo sul fronte della "diplomazia scientifica".

La ricerca scientifica di frontiera e le tecnologie emergenti assumono, infatti, una dimensione sempre più trasversale ed investono la sfera economica e commerciale, l'ambito politico, della sicurezza e della difesa, il contesto sociale e culturale. Su questo sfondo, la cooperazione scientifica e tecnologica con gli Stati Uniti riveste una valenza cruciale ed è certamente un pilastro essenziale dell'alleanza strategica tra i nostri due Paesi. Italia e Stati Uniti hanno una lunghissima tradizione di collaborazione in ambito scientifico e tecnologico. Le collaborazioni internazionali si stanno progressivamente strutturando attraverso accordi istituzionali, che coinvolgono il MUR e le Amministrazioni statunitensi: da ultimo tengo a ricordare il Memorandum con la National Science Foundation che consentirà di finanziare nei prossimi mesi progetti di ricerca congiunti, in particolare sull'intelligenza artificiale, anche grazie alle iniziative avviate con il PNRR.

Altrettanto importante è la cooperazione sul fronte delle infrastrutture di ricerca, che ha una lunga storia e che, ne sono certa, potrà avere un futuro ancora più promettente, sulla base di relazioni ormai consolidate.
Tengo a ringraziare in questa sede le reti di Ricercatori italiani nel mondo, perché contribuiscono in maniera significativa alle partnership strategiche dell'Italia, fondate su principi e valori condivisi e necessarie per affrontare, assieme ai nostri principali Paesi partner quali gli Stati Uniti, le delicate sfide dell'attuale congiuntura internazionale.
Alla *Texas Scientific Italian Community* va quindi il ringraziamento mio e del Governo per questa importante iniziativa, alla quale auguro il miglior successo.

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Consolato Generale d'Italia
Filadelfia

Filadelfia 4 aprile 2023

È con grande gioia che estendo il mio benvenuto alla XVII Conferenza dei Ricercatori Italiani nel mondo che si tiene quest'anno a Filadelfia.
Ringrazio i Proff.ri Giordano e Giuffrida e il Consiglier Arcobelli per l'organizzazione di quest'evento in una città che accoglie un'estesa comunità di ricercatori italiani attratti dalle istituzioni bio-mediche di eccezionale livello, ma anche dalle compagnie tecnologiche e start-up all'avanguardia.
Sono ben noti l'apporto dei nostri ricercatori al sapere comune necessario a far avanzare la conoscenza scientifica e la grande capacità di adattarsi a nuovi orizzonti di lavoro, portando non solo la loro altissima formazione, ma anche una capacità di fare ricerca e di analisi straordinaria che ne fanno una delle comunità più apprezzate nel mondo.
Nell'accogliervi in questa città culla della democrazia e della scienza, vorrei augurare a tutti i giovani presenti e a quelli collegati da remoto che quest'incontro non sia non solo un momento di scambio per voi, ma anche un ponte tra future collaborazioni con gli scienziati del paese che vi ospita e l'Italia, certa che la condivisione delle esperienze e la capacità di fare passi avanti per il bene comune deriva da uno scambio in due direzioni e non da un solitario esodo.
Per questo ci vogliono naturalmente le istituzioni e la capacità di rendere attraente per i ricercatori esteri il nostro Paese e di sicuro l'impegno di tutti per mettere la scienza al centro delle politiche e delle prospettive di crescita.

Con i miei migliori auguri

Cristiana Mele

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Tel: (215) 592-7329 Fax: (215) 592-9808

Consiglio Generale degli Italiani all'Estero
Segretario Generale

Alla cortese attenzione del
Consigliere Vincenzo Arcobelli
Dallas - Texas USA

Roma, 09 marzo 2023

Gentile Consigliere Arcobelli,

ho ricevuto la Tua corrispondenza del 23 febbraio u.s. con la richiesta del patrocinio gratuito del Consiglio Generale degli Italiani all'Estero alla XVII Conferenza dei Ricercatori Italiani nel Mondo, organizzata dalla Comunità Scientifica Italiana-Texas Scientific Italian Community (TSIC) in collaborazione con Sbarro Health Research Organization (SHRO) e la Temple College of Science and technology.

È con piacere che il Consiglio Generale degli Italiani all'Estero accoglie la richiesta e concede il patrocinio a questa iniziativa, che anche grazie alla sua continuità - in un ambito particolare come quello della ricerca - è ormai diventata un appuntamento ineluttabile.

La Conferenza, che si terrà il 1 Aprile 2023 presso la Temple University a Philadelphia Pennsylvania, promuove importanti scambi di idee e momenti di confronto anche fra i ricercatori e la collettività, sostenendo un approccio interdisciplinare nei settori più innovativi.
Promuovere questa sinergia di eccellenze diventa una sfida oltre che un punto di riferimento esemplare per la comunità italiana nel mondo.

Chi dedica alla ricerca la propria vita fa dello studio e della sperimentazione la sua professione e finalizza queste attività all'acquisizione di conoscenze in campo scientifico, medico e tecnologico che permettano di sviluppare nuove opportunità di cui potrà beneficiare l'intera società.

Caro Consigliere, il Consiglio Generale augura il miglior successo a tutti i protagonisti della XVII Conferenza dei ricercatori Italiani nel Mondo.

Il Segretario Generale CGIE
Michele Schiavone

Ministero degli Affari Esteri e della Cooperazione Internazionale - P.le della Farnesina, 1 00135 Roma
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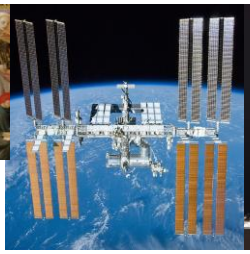


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ENEA

AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

Il Presidente

Roma, 24 MAR. 2023

Lettera di saluto ai partecipanti alla XVII Conferenza dei Ricercatori Italiani nel Mondo

Gentilissimi,

è un particolare piacere porgere il saluto di ENEA, Agenzia Nazionale per le Nuove Tecnologie e lo Sviluppo Economico Sostenibile, nell'ambito di questa importante conferenza che, nelle sue tappe globali, fa sistema tra i moltissimi ricercatori italiani che stanno svolgendo il loro percorso di crescita e maturazione professionale a livello internazionale.

Un sondaggio informale promosso dal Ministero degli Affari Esteri e della Cooperazione Internazionale nel 2021 ha contato circa 33mila ricercatori all'estero, con il gruppo più grande negli Stati Uniti, dove è stimato lavorino più di 15.000 scienziati italiani. Seguono il Regno Unito, che ne conta circa 6.000 e la Francia e la Germania con circa 3.500 ciascuno. Se ne stimano altrettanti nella Penisola iberica. In Norvegia sono 500, altri 500 in Australia, 200 in Messico, 100 a Singapore, 150 in Giappone, 120 in Sudafrica, 50 in Cina. Non ne mancano in Vietnam, in Corea e in molti altri Paesi. Una presenza quindi importante a livello globale, che senza dubbio è rappresentativa del talento dei nostri ricercatori, della base culturale e della formazione accademica fornita in Italia, ma forse anche di opportunità da sviluppare ulteriormente a pieno da parte del Sistema Paese italiano.

ENEA collabora a livello internazionale con decine di istituti di ricerca ed accademie, e supporta le Amministrazioni centrali italiane in varie iniziative di promozione e sviluppo di relazioni con Istituzioni scientifiche di altri Paesi, per rafforzare i partenariati e promuovere le attività di ricerca, innovazione, trasferimento tecnologico e di messa a disposizione di competenze multidisciplinari avanzate nel più ampio contesto globale.

Il Ministero dell'Ambiente e della Sicurezza Energetica (MASE) e l'Agenzia Italiana per la Cooperazione allo Sviluppo (AICS) sono le principali istituzioni nazionali con cui l'ENEA collabora nel campo della Cooperazione allo Sviluppo, assicurando la coerenza con le priorità geografiche e tematiche nazionali, proprio ai fini delle attività di cooperazione allo sviluppo e per il raggiungimento degli obiettivi dell'Agenda 2030 delle Nazioni Unite in settori quali energia, acqua, clima, ambiente, salute e agricoltura.

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Per ampliare la propria capacità di azione a livello internazionale e realizzare azioni congiunte su tematiche di comune interesse, ENEA partecipa inoltre con propri esperti e rappresentanti a iniziative e progetti di organismi internazionali, a comitati e gruppi di lavoro internazionali e stipula convenzioni ed accordi con istituzioni ed enti di altri Paesi. In linea con le competenze prima menzionate, i principali campi di intervento riguardano: energie rinnovabili, mitigazione e adattamento al cambiamento climatico, innovazione del sistema agro-industriale, uso efficiente delle risorse naturali, ciclo dell'acqua, gestione integrata dei rifiuti, efficienza energetica, turismo sostenibile, sicurezza nucleare, soluzioni innovative per la salute, tecnologie per il patrimonio storico e artistico.

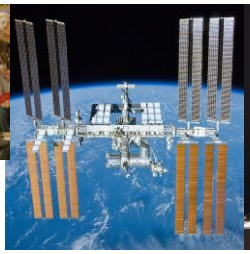
Tra tali organismi ENEA collabora ad esempio con OCSE, IEA, AIEA, FAO, UNIDO e l'Istituto Italo Latino Americano (IILA) e con associazioni quali, RES4MED e RES4AFRICA, MEDENER (da novembre 2016 l'Agenzia presiede l'Associazione e ne coordina il segretariato), partecipando ai lavori attraverso propri esperti nei Comitati e nei gruppi di lavoro costituiti.

Ulteriori attività di cooperazione scientifica sono poi legate ai rapporti con la Rete degli Addetti Scientifici Italiani all'estero e con le ambasciate straniere in Italia e alla partecipazione a bandi di Progetti di Grande rilevanza e di Mobilità promossi dal MAECI. Su questo tema si è recentemente tenuta la Conferenza annuale degli Addetti Scientifici presso l'Università di Padova in cui si è evidenziata la necessità di rafforzare il ruolo degli addetti scientifici nel mondo per valorizzare la science diplomacy con reali ricadute per il settore produttivo italiano.

Oltre alla cifra strettamente quantitativa della presenza di ricercatori italiani all'estero e delle molteplici iniziative internazionali dei ricercatori di ENEA, va quindi evidenziata la qualità della ricerca da questi svolta e la *messe* di risultati conseguiti, misurabili in termini di pubblicazioni e di premi scientifici collezionati, in Europa secondi solo alla Germania. Un apprezzamento che ha senza dubbio una significativa ricaduta in termini reputazionali per l'Italia, che trova poi riflesso anche nella percezione che va ben oltre la ricerca strettamente intesa, ma anche sulla qualità ed appetibilità del "Made in Italy". Un Paese, il nostro, che senza dubbio deve affiancare alla qualità dei prodotti e servizi tradizionali e tipici, anche una continua spinta all'innovazione e sostenibilità del proprio tessuto produttivo ed industrie, per potersi confrontare mantenendo una leadership nella competizione del Mercato globale.

Senza dubbio lo scambio di ricercatori tra Paesi diversi a livello globale, con il suo effetto di catalisi e sinergia tra culture diverse, è anche un antidoto contro miopie e localismi troppo spesso ancor'oggi ben presenti nella politica internazionale. Fare Ricerca senza confini geografici, indubbiamente aiuta ed ha sempre aiutato il miglioramento degli standards di vita dei popoli e la disponibilità al dialogo, riducendo le distanze culturali ed economiche. I ricercatori sono, oltre che scienziati, anche veri e propri Ambasciatori Culturali, con un importante ruolo di comunicare ai colleghi di altre nazioni e comunità i valori più positivi di inclusività, di democrazia di collaborazione costruttiva tipici degli italiani, e che sono intrinsecamente connaturati con la vera Scienza.




È infatti per questo che la Carta Europea dei Ricercatori guarda agli effetti sulla qualità dei risultati della Ricerca, anche in termini di creazione di piattaforme di collaborazione tra Paesi, nel caso Comunitari, e sottolinea ed incentiva la circolazione di scienziati a livello internazionale. Proprio l'esperienza dei nostri ricercatori fatta in altri contesti, una sempre maggior propensione all'internazionalizzazione di Accademia ed Enti di Ricerca, la spinta alla semplificazione unita alle risorse del Piano Nazionale di Ripresa e Resilienza, sono una opportunità complessiva su cui lavorare tutti insieme per giungere ad una effettiva circolarità di risorse con i Paesi partners ed, auspicabilmente, un pareggio del bilancio tra ricercatori uscenti ed entranti nel nostro Paese, invertendo un trend non equilibrato a nostro svantaggio, forse anche troppo evidente negli ultimi decenni.

Auguriamo quindi buon lavoro ai partecipanti a questa conferenza e più in generale a tutti i nostri ricercatori attivi nel contesto internazionale.

Gilberto Dialuce

Emilia Zankina

TEMPLE UNIVERSITY ROME

Dean

EMAIL

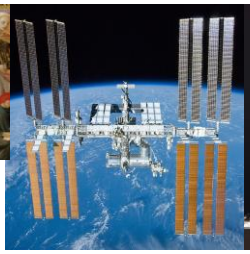
emilia.zankina@temple.edu

Emilia Zankina stepped in as the new **Dean of Temple University Rome** in May 2020. She brings over a decade of experience in international education both in the United States and Europe and a deep commitment to the liberal arts tradition.

In the past, she has served as Provost of the American University in Bulgaria, Associate Director of the Center for Russian and East European Studies at the University of Pittsburgh, and Managing Editor of the high-ranked academic journal East European Politics and Societies.

She holds a Ph.D. in International Affairs and a Certificate in Advanced East European Studies from the University of Pittsburgh and publishes on topics such as democratization and elite transformation, populism, civil service reform, and gender political representation. Dean Zankina is a dedicated teacher in political science and volunteers with various organizations that support democratic governance, art and culture. She has a passion for dance and languages; she is an active dance teacher and speaks over five languages.




TEXAS SCIENTIFIC ITALIAN COMMUNITY

SHRO SBARRO HEALTH RESEARCH ORG.

Program

XVII Conference of Italian Researchers in the World

April 1, 2023

09:30 (EST) – 15:30 (Italian Time) – Moderated by

Patrizia Angelini
Giornalista - Rai
Inviata TG1- Speciali TV7

09:30 Welcome

Gregory N. Mandel
Provost Temple University

Antonio Giordano
President, Sbarro Institute for Cancer Research (SHRO) - XVII Conference Executive Director

Andrea Giuffrida
President Texas Scientific Italian Community (TSIC)

Cristiana Mele
Consul General of Italy-Philadelphia

10:10 Opening Remarks

Vincenzo Arcobelli
Conference Chairman
Rep. General Council for Italians Abroad - (CGIE)

10:15 Research - Global Engagement

INTRODUCTION

Silvio Brusaferro
Presidente Istituto Superiore di Sanitá

Emilia Zankina
Vice Provost Global Engagement
Dean Temple University-Roma Campus

10:30 Associations of Italian Researchers Abroad- "Their Role"

Fabio De Furia
President, Miami Scientific Italian Community (MSIC)

Rosanna Bonasia
President, Associazione Ricercatori Italiani in Messico (ARIM)

Rossana De Angelis
President, Rete dei Ricercatori Italiani in Francia (RÉCIF)

Antonino Marcianò
President, Association of Italian Scholars in China (AAIIC)

11:10 Sessions Presentation

AEROSPACE
Moderator
Francesco Fusco
FISE –Executive Director Foundation for International Space Education

Andrea Bari
Aerospace Engineering, Polytechnic University of Turin, Plasma Physics Lab at Stanford University, California
Harnessing solar wind for interplanetary propulsion

11:30

MEDICINE
Moderators
Gianfranco Bellipanni
Ph.D., Sbarro Health Research Organization/Temple University Philadelphia

Antonio Di Carlo
Professor, Surgery Chief, Abdominal Organ Transplant Surgery Surgical Director, Kidney, Liver and Pancreas Transplantation, and Living Donation, Temple University Hospital Chief, Transplantation, Saint Christopher's Hospital for Children, Philadelphia

Roberto Malighetti
Visiting professor Minzu University of China (Beijing).
Director CREAM (Centro Ricerche EtnoAntropologiche Milano)
Prof.Department of Human Sciences and Education Università degli Studi di Milano.Bicocca
The plural unification of sciences: the contributions of anthropology to the interdisciplinary dialogue

Alfonso Bellacosa
Professor,Nuclear Dynamics and Cancer Program,Cancer Epigenetics Institute Fox Chase Cancer Center Philadelphia
TET1 and TDG suppress inflammatory response in intestinal tumorigenesis: implications for colorectal tumors with the CpG Island Methylator Phenotype

Antonio Colaprico
Ph.D., Associate Scientist (University of Miami) Post doc researcher in Bioinformatics (Université Libre de Bruxelles) Ph.D. in Bioinformatics (University of Sannio, Italy)
Bioinformatics tools to integrate and understand molecular changes associated with Immune Response, Stemness and Oncogenic processes: A PanCancer study.

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Enrico Cavarzerani
Ph.D., Department of Molecular Sciences and Nanosystems, Ca Foscari University of Venice, Pathology Unit, Centro di Riferimento Oncologico Department of Medical, Surgical and Health Sciences, University of Trieste
A passive microfluidic platform for a personalized therapy in HGSOC patient derived organoids

Francesca Cersosimo
Researcher in Genetic, Oncology and Clinical Medicine at the University of Siena/Sbarro Health Research Organization and Molecular Medicine Temple University, Philadelphia
The Investigation of CSF-1R signaling pathway In Malignant Mesothelioma

Lucia Coronel
Researcher, Department of Biology Temple University
"Role of lipids in hydrophobic gating and blocker affinity in BK channels".

Sara Damiano
Ph.D., Associated Professor in Veterinary Pharmacology and Toxicology, University Federico II, Naples, Department of Veterinary Medicine and Animal Productions, Sbarro Institute for Cancer Research and Molecular Medicine, Temple University, Philadelphia
Red orange and lemon extract ameliorates the renal toxicity effect induced by Ochratoxin A through the modulation of ROS accumulation and NF-kB signaling

Pietro Mancuso
Ph.D., Department of Microbiology, Immunology and Inflammation Center for Neurovirology and Gene Editing /Lewis Katz School of Medicine at Temple University, Philladelphia
Removal of SIV Proviral DNA Fragments by CRISPR from Blood and Lymphoid Cells of Living ART Treated Non-Human Primates.

Luciano Mutti
Ph.D., Sbarro Health Research Organization/Temple University Philadelphia
Adenosine Pathway as a prognostic biomarker and an actionable target to overcome "immune escape" of human tumors: the Mesothelioma model.

Alberto Riva
Scientific Director
Bioinformatics Core, Interdisciplinary Center for Biotechnology Research University of Florida
Single-cell technologies for biomedical research

Giovanna Rossi-Márquez
Ph.D., Biotechnological Sciences Tecnológico Nacional de México Instituto José Mario Molina Lagos de Moreno
Effect of Transglutaminase-crosslinked coating to reduce the fat-uptake of fried sausages

Antonio Russo
Physician, Cardiologist and Sports Medicine Doctor USL Umbria 1-Perugia (Italy) Cardiologist Healtcare Staff Società Sportiva Calcio Napoli (Italy)
Long-term correlation between cardiorespiratory fitness, spirometric parameters andradiology in patients hospitalized for Covid-19: the study «Captain Covid »

Luca Tottone
Ph.D., Assistant Scientist Nimer Lab Sylvester Comprehensive Cancer Center-University of Miami
Epigenetic and Transcriptional Dysregulations Promoting Acute Leukemias Development

Alessia Zamborlini
Professor in Virology at Paris Saclay University, France
Understanding the molecular bases of the anti-HIV activity of SAMHD1, independent of its dNTPase function

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13.50

STEAM
Moderator
Rosanna Bonasia
Ph.D., Civil Sustainable Technologies School of Engineering and Sciences Tecnologico de Monterrey Campus, Estado de Mexico

Andrea Morrione
Ph.D., Sbarro Health Research Organization/Temple University Philadelphia

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Marco Baldocchi
CEO & Neuromarketing expert- Miami National Association of Neuroscience
How can I create a different product in a crowded market like wine?

Lorenzo Brancaleon
Ph.D., Department of Physics and Astronomy University of Texas at San Antonio
Effects of laser irradiation of self-assembled complexes of photosensitizers with globular proteins

Massimiliano Galeazzi
Ph.D., & Chair of Physics Cooper Fellow University of Miami
Wide field X-ray telescopes for space

Emanuele Giorgi
Ph.D., Director of Research School of Architecture, Art and Design
Tecnológico de Monterrey, Mexico
Le sfide tecnologiche nelle comunità più vulnerabili. Uno studio nello Stato di Chihuahua, Messico.

Giuseppe Loianno
Director of the Agile Robotics and Perception Lab, New York University
Learning Robot Super Autonomy

Simone Lucatello
Ph.D., Consiglio Nazionale di Scienza e Tecnologia (CONACYT) Mexico, Coordinatore Leader rapporto GEO 7 Programma delle Nazioni Unite (ONU) e per l'Ambiente(UNEP)
International Environmental Scientific Diplomacy and GEO-7

Francesco Randi
Ph.D., Department of Physics, and Neuroscience Institute, Princeton University, Princeton New Jersey
Neural signal propagation atlas of C. elegans

Enrico Santus
Ph.D., Data Scientist Head of Human Computation CTO Office at Bloomberg, New York
Artificial Intelligence: Italy, Do Not Stop the Progress: Create It!

15:30

HUMANITIES
Moderator
Amedeo Arena
Professor, Università degli Studi di Napoli Federico II Dipartimento di Giurisprudenza/ Delegate for International Relations and Coordinator for the Academic Cooperation Agreements with UC Berkeley, Denver University
Back from Oblivion: The Rediscovery of Domenico Cirillo's Forgotten Election to the American Philosophical Society

Moira Di Mauro-Jackson
Ph.D., Italian Program Coordinator Department of World Languages and Literatures
Texas State University, San Marcos
D'Annunzio's Il piacere: A Farcical Socio-Political Dissent

Alessandra Vannucci
Ph.D., Director and playwright Professor (UFRJ-Brazil)
Postdoctoral visiting scholar (COLUMBIA UNIVERSITY)
The queen of the stages at the Emperor's court.

16:00 (EST) Conclusion

Ph.D., Antonio Giordano (XVII Conference Executive Director)

Ph.D., Andrea Giuffrida
President, Texas Scientific Italian Community

MODERATOR

Patrizia Angelini
Giornalista Rai
Inviata TG1 – Speciali TV7
Presidente Osservatorio Nazionale Antimolestie
Vice presidente commissione anti molestie
Federazione Italiana sport equestri Relazione esterne e Comunicazione Etica FISE
Presidente Italian Women in the World
Direttore artistico del Festival del Docufilm italiano nel mondo Italia in the World

ASSOCIATIONS OF ITALIAN RESEARCHERS ABROAD

"THEIR ROLE"

TEXAS SCIENTIFIC ITALIAN COMMUNITY

SHRO SBARRO HEALTH RESEARCH ORG.

MIAMI SCIENTIFIC ITALIAN COMMUNITY

The President

Filadelfia 1 Aprile 2023

Grazie Presidente Andrea Giuffrida e Presidente Antonio Giordano per avermi invitato e "hello" to Gregory Mandel, Provost at Temple University.

Saluto la Console Generale a Filadelfia Cristiana Mele, le autoritá presenti, i miei colleghi Presidenti delle associazioni dei ricercatori italiani all'estero e tutti i ricercatori presenti.

Ma permettetemi un saluto e un ringraziamento particolare a Vincenzo Arcobelli padre fondatore della Conferenza per la sua missione e visione a sostegno della comunità italiana tutta e perché prima di altri ha saputo coniugare il saper fare con il saper essere sostenendo da 16 edizioni che non ci può essere sviluppo economico senza innovazione e sostegno alla ricerca scientifica. Vincenzo e con oggi facciamo 17. È veramente un piacere vedere il consolidamento di un format come quello della Conferenza dei Ricercatori Italiani nel Mondo oramai diventato un appuntamento fisso per i ricercatori italiani all'estero, e la nostra partecipazione porterà le riflessioni di una comunità scientifica internazionale che sempre più sostiene la ricerca pubblica italiana.

Sono molto felice di essere qui in qualità di Presidente della Miami Scientific Italian Community, un centro di trasferimento tecnologico italiano negli USA (sullo stesso modello delle Città Ricerche Italiane). Noi facilitiamo l'incontro delle piccole e medie imprese e nuove tecnologie sostenendo insieme ai nostri soci programmi di sviluppo tecnologico e la partecipazione a grant USA, misure regionali nazionali ITA o Horizon Europe e che quest'anno festeggerà il 10° anniversario della sua costituzione.

Naturalmente, come tutti sapete, l'innovazione è un concetto sfuggente e non meno sfuggente è ciò che possiamo fare per crearne di più. Ma credo che possiamo essere certi di tre cose. In primo luogo, l'innovazione è essenziale per la crescita economica. In secondo luogo, il capitale umano, ovvero le conoscenze e le competenze che rendono le persone più produttive, è alla base dell'innovazione. Infine, l'innovazione influisce a sua volta sul rendimento degli investimenti in capitale umano. Queste tre intuizioni hanno importanti implicazioni per i nostri sforzi di aiutare gli imprenditori a fare investimenti fruttuosi sul proprio capitale umano e a creare la forza lavoro qualificata di cui la nostra economia ha bisogno.

La necessità di promuovere la valorizzazione e il trasferimento dell'innovazione tecnologica dal mondo della Ricerca a quello dell'Industria si è fatta sempre più pressante, in questi ultimi anni, anche alla luce della crescente globalizzazione dei mercati. A mio parere non vanno ipotizzati percorsi standard o una mera direzionalitá dai laboratori alle imprese ma vanno, viceversa, costruiti percorsi comuni e condivisi.
Per le piccole e medie imprese, che generalmente non dispongono di valide strutture di ricerca, l'acquisizione di nuove tecnologie è quindi molto importante per raggiungere o mantenere una posizione competitiva sui mercati nazionali e internazionali.

1680 Michigan Avenue, Suite 700 Miami Beach, FL 33139 P: +1 305-707-4175 mail: info@miamisic.org

TEXAS SCIENTIFIC ITALIAN COMMUNITY

SHRO SBARRO HEALTH RESEARCH ORG.

MIAMI SCIENTIFIC ITALIAN COMMUNITY

The President

Su queste basi, nel 2013 abbiamo creato la prima piattaforma italiana per l'estero per lo scouting di tecnologie brevettate provenienti dal mondo della ricerca pubblica Italiana, pensata per aggiungere nella percezione del Made in Italy all'estero che l'Italia non era solo "Food, Fashion e Furniture" ma che in pancia alle nostre Universitá e Centri di Ricerca c'erano tecnologie che potevano competere con chiunque negli USA e nel mondo.

Uno strumento nato per creare l'incontro tra università, aziende e finanziatori e che rappresentava e rappresenta il canale ufficiale attraverso il quale vengono valorizzate le tecnologie che hanno le potenzialità per trovare applicazione concreta dall'incontro e dallo scambio con il mondo dell'impresa. Una massa critica di più di 2000 tecnologie che spaziano in tutti i principali settori tecnologici ed industriali e tutte le informazioni contenute all'interno di ogni "scheda brevettuale" sono costruite ad hoc per fornire, in maniera sintetica e chiara, le informazioni essenziali e utili a innescare l'interesse dei potenziali investitori e creare punti di contatto con le aziende.

La domanda di più ricerca e più innovazione deve quindi trovare risposte nuove, adeguate ai cambiamenti nel generare e utilizzare tecnologia anche rispetto al rapporto e alle trasformazioni nelle relazioni non sequenziali che portano dalla ricerca all'innovazione.
La geopolitica della ricerca, dopo due anni di pandemia e nel quadro dei nuovi scenari internazionali, vede un nuovo ruolo per le vetrine delle competenze, delle conoscenze, dei risultati. Si stabiliscono nuove relazioni con nuovi bacini territoriali di riferimento. Non vi è certamente una spinta all'autosufficienza ma la globalizzazione, anche in ambito scientifico e tecnologico, cambia pelle e si realizzano più relazioni di vicinato, dove il vicinato non è quello geografico ma quello derivante da accordi, condivisioni, partenariati strutturati.

Abbiamo sempre sottolineato che la ricerca, il trasferimento tecnologico e l'innovazione non sono qualcosa da improvvisare e che è quindi necessario avere una strategia di sviluppo a medio-lungo termine che usi la conoscenza e la competenza come acceleratori fondamentali.
Nel rilancio della Scienza, Tecnologia e Innovazione oltre a fare squadra, in questa partita le associazioni giocano un ruolo essenziale, sono fabbriche di futuro, in quanto fanno coesistere i ricercatori che hanno l'attitudine a cogliere i segnali del cambiamento, e i soggetti sociali ed economici che sono in grado di tradurre i segnali in azioni concrete. Così facendo si realizzano le condizioni per rispondere alle sfide dei nuovi paradigmi della societá contemporanea oggi sempre piú orientati alla sostenibilitá e l'inclusivitá.

Il sistema Italia sta facendo, nell'ambito del Piano Nazionale di Ripresa e Resilienza (PNRR) uno sforzo per rafforzare alcune delle sue croniche debolezze, la difficoltà a porsi "in una logica di sistema", a "realizzare piattaforme condivise", a investire in modo non episodico su una ricerca che sappia arrivare all'impresa e, di conseguenza, generare innovazione.

Noi ci siamo.

Grazie per l'attenzione e buon convegno!

Fabio De Furia

1680 Michigan Avenue, Suite 700 Miami Beach, FL 33139 P: +1 305-707-4175 mail: info@miamisic.org

Rosanna Bonasia
President, Associazione Ricercatori Italiani in Messico (ARIM)

Master's degree in Geological Sciences and PhD in Earth Sciences from the Università degli Studi di Bari.

Post-doctorate on tephra fallout hazard assessment at Vesuvio and Campi Flegrei, at the NaIonal Institute of Geophysics and Volcanology in Naples, Italy.

Post-doctorate on tephra fallout hazard assessment for explosive Mexican volcanoes, at the Geosciences Center of the UNAM, Querétaro, Mexico.

Volcanologist by training, specialized in Computational Fluid Dynamics and risk analysis related to natural and engineering phenomena, through the application of numerical models and statistical analysis.

Currently Professor in Civil Engineering and Sustainable Technologies at the Tecnológico de Monterrey, Campus State of Mexico, Mexico.

The main research lines currently developed are:

- Analysis and evaluation of flood risk in Mexico through the study of hydrodynamic properIes in channels and dams by the application of Eulerian and Lagrangian numerical models (SPH);
- Numerical study of wave transport and calculation of energy potential on the coasts of Mexico;
- Numerical simulations using the SPH model of the tsunami impact on the coasts;
- Long-range hazard assessment of dispersion and deposit of volcanic ash, through numerical models.

DISTINCTIONS

President of the Association of Italian Researchers in Mexico (ARIM). March 2023.
Mexican National System of Researchers Level 2.
Award for Educational Excellence Cusco 2020 Edition.
Doctor Honoris Causa and Golden Order of Teaching awarded by the International Organization for Inclusion and Educational Quality (OIICE).
President of the Fluid Dynamics Division of the Mexican Physics Society. 2019 - 2021.

SCIENTIFIC PRODUCTION

More than 20 scientific aticles in JCR journals and three book chapters.
Editor of Frontiers in Earth Sciences journal special issue: “Flood Susceptibility and Risk

Maps as a Crucial Tool to Face the Hydrological Extremes in Developing Countries: Technical and Governance Aspects Linked by a Participatory Approach”.

Rossana De Angelis
President, Rete dei Ricercatori Italiani in Francia (RÉCIF)

RéCIF é un'associazione a fini non lucrativi, ai sensi della legge francese del 1901, e a carattere volontario.

Scopi dell'associazione:
Réseau des Chercheurs Italiens en France (RéCIF) è una rete di persone, idee e progetti, creata con lo scopo di riunire i ricercatori e i professionisti italiani operanti in Francia nei campi della Ricerca, dell'Impresa e della Cultura.

RéCIF promuove:
- La valorizzazione del ruolo del ricercatore italiano all'estero, figura professionale inserita in un tessuto sociale ed economico ben definito.
- La creazione di una rete di ricercatori e professionisti italiani operanti in Francia e nel mondo, volto alla conoscenza, al confronto e alla collaborazione reciproci.
- Lo sviluppo di una rete tra associazioni di categoria ed enti pubblici e privati, operanti in Francia e nel mondo nei campi della Ricerca, dell'Impresa e della Cultura.
- L'assistenza all'integrazione dei giovani ricercatori italiani in Francia, fornendo informazioni sulle modalità di supporto alla ricerca, e sul reperimento di stage ed attività presso enti pubblici e privati.
- L'organizzazione di eventi di discussione, confronto ed indirizzo su tematiche inerenti i mondi della Ricerca, dell'Impresa e della Cultura.

Antonino Marcianò
President, Association of Italian Scholars in China (AAIIC)

Experiences:

2004/04 Laurea in Physics, University of Rome (Italy)
2008/01 PhD in Physics, University of Rome (Italy)
2007/10-2010/08 Postdoctoral Research Fellow, Centre de Physique Theorique, Marseille (France)
2010/02-2010/08 Postdoctoral Research Fellow, University of Rome (Italy)
2010/09-2011/08 Postdoctoral Research Fellow, Haverford College (USA)
2011/09-2012/08 Visiting fellow, as postdoctoral researcher, Princeton University (USA)
2012/09-2013/12 Postdoctoral Research Fellow, Dartmouth University (USA)
2014/01-present Young professor, Fudan University, China

Teaching and Research Interests:

Teaching: quantum mechanics, general relativity, quantum field theory, early cosmology and CMBR physics, quantum cosmology and quantum gravity
Research interests: early cosmology, inflation, dark energy, quantum cosmology and quantum gravity, quantum gravity phenomenology
Published about 30 research articles on refereed journals with high impact factor. H-index: 10 (INSPIRE)

BIOS AND ABSTRACTS


TEXAS
SCIENTIFIC
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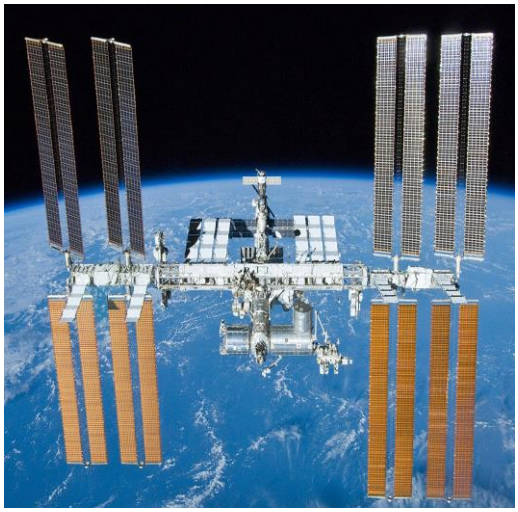

AEROSPACE

MODERATOR

Francesco Fusco
Executive Director FISE
Foundation for International Space Education, Houston, Texas

Francesco Fusco is a rocket propulsion engineer with significant experience in international space and aeronautics programs. After completing his thesis during an internship at NASA Johnson Space Center, Mr. Fusco was awarded the Laurea in Ingegneria Aerospaziale by the Politecnico di Torino. He joined Alenia Flight Test in Caselle Torinese and supported Eurofighter (EF2000) flight test activities as propulsion, avionics and weapon systems specialist. During Space Shuttle Return to Flight he joined the Boeing Company as the Responsible Engineer for the RCS (Reaction Control System) thrusters. As Technical Lead Engineer he supported a variety of programs, such as Space Launch System (SLS), 777-X, KC-135, KC-46A, B-52 and B1B. He was Test Conductor for the CST-100 Starliner Service Module Hot-Fire testing and he is part of the Boeing Engineering Support Team (EST) for ARTEMIS Day of Launch. Mr. Fusco is the Executive Director of the Foundation for International Space Education (FISE), which provides access and exposure of the space industry to students from around the world. FISE mission is to promote STEM studies and international collaborations by providing space-based, academic instruction in a collaborative environment to international, pre-collegiate students while offering an introduction to the aerospace industry.

HARNESSING SOLAR WIND FOR INTERPLANETARY PROPULSION

Andrea Bari
Aerospace Engineering, Polytechnic University of Turin, Plasma Physics Lab at Stanford University, California

ABSTRACT

Pekka Janhunen of the Finnish Meteorological Institute first proposed the concept of electric sails in 2006, which utilize the solar wind dynamic pressure to generate a small, yet continuous thrust by interacting with an electric field generated from charged tethers. This technology could be a competitive propulsion system for future missions, and NASA's Marshall Space Center has provided funding for a Small Business Technology Transfer Phase II project to model the thruster performance of an E-sail spacecraft. This work will include a test campaign to validate parallel 3D Particle-In-Cell (PIC) codes with improved boundary conditions. This dissertation entails the experimental test campaign needed to validate the parallel 3D Particle-In- Cell (PIC) codes with improved boundary conditions. This campaign will be focused on characterizing the performances of a surrogate sail exposed to a high density, high velocity plasma stream simulating the solar wind, exploiting novel plasma accelerators. To better estimate the power consumption required for keeping the tethers at high potential the current the discharge will be investigated. The current collection is as well tested, aiming to explore the capability for the e-sails to act as an alternative source of electric energy for interplanetary spaceflight. Estimating the momentum poses challenges, in particular devising a thrust measurement technique that allows for high sensitivity. Upon successful completion of the Phase II effort, the validated PIC-based approaches will be used to examine the controllability and optimization of E-sail spacecraft, including its size and layout, as well as adapting it to the hanging plasma environment for in-space operations.

BIOGRAPHY

Andrea Bari received his Bachelor's degree in Aerospace Engineering from the Polytechnic University of Turin in October 2020. He is currently pursuing his Master's degree in Space Engineering at the same institution. In 2021, he was awarded a one-year exchange program at Delft University of Technology in the Netherlands, where he specialized in space propulsion. Starting in November 2022, he was accepted into the Plasma Physics Lab at Stanford University, where he is developing and testing advanced concepts of Electric Sail under the supervision of Professor Mark Cappelli and a grant from NASA's Marshall Space Center.

MEDICINE

MODERATOR

Gianfranco Bellipanni
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Dr. Bellipanni received formal undergraduate education in Molecular Biology and graduate training in Cellular and Developmental Biology at University of Palermo, Italy. He completed post-doctorate research at the University of Pennsylvania and at the Institute of Developmental Genetics at the GSF-National Research Center for Environmental and Health, Munich (Germany). Starting 2004, Dr. Bellipanni was a research faculty at the University of Pennsylvania, then, he moved in 2008 to Temple University as instructor and as principal investigator in the Sbarro Institute.

The research in Dr. Bellipanni laboratory focus on mechanisms of zebrafish embryonic development and cancer induction and growth by studying the role of beta-catenin activity in the nucleus as central regulator of canonical-Wnt signaling. His laboratory also uses the zebrafish to model some aspects of nociception. The laboratory applies modern molecular-genetic approaches like CRISPR/Cas9 site-direct mutagenesis and transposon-based transgenics.

As an associate professor of instructor at Temple University Dr. Bellipanni has been teaching General Biochemistry courses, Developmental Biology, Evo-Devo, and Systems Biology courses. More recently, he established the Temple-Sicily Program that is a summer study-abroad program where students can learn about the use of biotechnologies for the conservation of ancient artwork and manufacts belonging to our cultural heritage.

MODERATOR

Antonio Di Carlo
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Defining the Hepatic Retransplantation Landscape: the DCD Debate Continues

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Introduction: Donation after cardiac death (DCD) livers are widely considered substandard for transplantation as compared to donation after brain death (DBD) livers due to higher rates of early allograft dysfunction, primary non-function, and biliary complications. The only life-saving cure for patients whose primary grafts fail is liver retransplantation (re-Tx). However, the comparison between the use of DCD and DBD livers has not been characterized clearly when it comes to retransplantation. Considering that survival outcomes after liver retransplant are inherently worse than after primary transplant, it is imperative to know what graft conditions and characteristics may offer patients the best chance of survival post-retransplantation. This study serves to bring those factors to light.

Methods: Using UNOS / OPTN data, all patients who received at least one deceased donor liver retransplant from January 1993 to December 2020 were identified. The population (n=10,536) was further subdivided into patients who received a DCD liver retransplant (n=140) and those who received a DBD liver retransplant (n=10,396). Categorical variables were presented as numbers and percentages and compared with the Pearson chi-square test. Numerical, continuous data were represented through median and interquartile range (IQR) and compared with the independent samples nonparametric k-test. Survival was analyzed using Kaplan-Meier curves and the log-rank test. All tests were conducted with a 95% confidence interval. Data were analyzed in IBM SPSS version 28.

Results: Patients who received a DCD liver for retransplant had significantly worse graft survival time than those who received a DBD liver (700 vs 1333 days, p-value=.011). DCD re-Tx patients had a lower 1-year survival rate than DBD re-Tx patients (54.3% vs 65.4%, p-value=.006), with no difference in long-term 5-year survival rate (35% vs 41.1%, p-value=.143). Median post-re-Tx hospitalization was extended in the DCD population (23 vs. 15 days, p-value = .005). A higher percentage of DCD re-Tx patients needed to be subsequently retransplanted than DBD re-Tx patients (15 vs. 8.1, p-value= .003). There were no significant differences between the two groups regarding causes of graft failure. Within the DCD re-Tx population, there were no significant differences in graft survival when high (>=30) and low (<30) MELD scores (p-value=.139), longer (>8 hours) and shorter (<=8 hours) cold ischemia times (p-value=.575), and older (>65 years) and younger (<=65 years) recipient ages (p-value=.885) were contrasted respectively.

Conclusion: Our study confirms that liver retransplantation with DCD livers results in overall unfavorable outcomes as compared to with DBD livers. Hence, we recommend exercising caution when considering the utilization of DCD livers for retransplant.

TET1 and TDG suppress inflammatory response in intestinal tumorigenesis: implications for colorectal tumors with the CpG Island Methylator Phenotype

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ABSTRACT

Background & aims: Aberrant DNA methylation is frequent in colorectal cancer (CRC), but underlying mechanisms and pathological consequences are poorly understood.
Methods: We disrupted active DNA demethylation genes *Tet1* and/or *Tdg* from *Apc*^{Min} mice, and characterized the methylome and transcriptome of colonic adenomas. Data were compared to human colonic adenocarcinomas (COAD) in TCGA.
Results: There were increased numbers of small intestinal adenomas in *Apc*^{Min} mice expressing the *Tdg*^{N151A} allele, whereas *Tet1*-deficient and *Tet1/Tdg*^{N151A}-double heterozygous *Apc*^{Min} colonic adenomas were larger with features of erosion and invasion. We detected reduction in global DNA hypomethylation in colonic adenomas from *Tet1*- and *Tdg*-mutant *Apc*^{Min} mice, and hypermethylation of CpG islands in *Tet1*-mutant *Apc*^{Min} adenomas. Upregulation of inflammatory, immune and interferon response genes was present in *Tet1*- and *Tdg*-mutant colonic adenomas compared to control *Apc*^{Min} adenomas. This upregulation was also seen in murine colonic organoids and human CRC lines infected with lentiviruses expressing *TET1* or *TDG* shRNA. A 127-gene inflammatory signature separated COAD into four groups, closely aligned with their microsatellite or chromosomal instability, and characterized by different levels of DNA methylation and *DNMT1* expression that anti-correlated with *TET1* expression. Tumors with the CpG island methylator phenotype (CIMP) had concerted high DNMT1/low TET1 expression. *TET1* or *TDG* knockdown in CRC lines enhanced killing by NK cells.
Conclusions: Our findings reveal a novel epigenetic regulation, linked to the type of genomic instability, by which TET1-TDG-mediated DNA demethylation decreases methylation levels and inflammatory/interferon/immune responses. CIMP in CRC is triggered by an imbalance of methylating activities over demethylating activities. These mice represent a model of CIMP CRC.

BIOGRAPHY

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A BIO-INFORMATIC INVESTIGATION OF CAT'S SUSCEPTIBILITY TO CORONAVIRUS-DERIVING EPITOPES

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ABSTRACT

SARS-CoV-2 is a highly transmissible and pathogenic virus for humans, yet its infectivity has also been reported in domestic animals.[1-3] To date, the mechanisms underlying the susceptibility of some animals to SARS-CoV-2 infection are still largely elusive. Recently, an Italian study demonstrated that different Class I/II human leukocyte antigen (HLA) alleles might define an individual susceptibility to SARS-CoV-2 spreading, contributing to the differences in the distribution of the infection through different populations (e.g., Northern and Southern Italy)[4]. Moreover, several studies suggested that the homolog of the human HLA, the Feline Leukocyte Antigen (FLA), plays a pivotal role in the transmission of viruses to cats.[5] With these premises, this study aimed to explore a novel bio-informatic approach in order to predict the transmissibility potential of SARS-CoV-2 and two distinct Feline Coronaviruses (FCoVs) of domestic cats (namely, Feline enteric Coronavirus, FeCV and Feline Infectious Peritonitis Virus, FIPV).[6] We performed an epitope mapping of 9 residues long amino acids deriving from SARS-CoV-2, FeCV and FIPV glycoproteins and predicted their affinities for different alleles of the three main loci in class I FLAs[7] – 12 variants of FLA-I E, 7 of FLA-I H of 5 for FLA-I K – as deposited on UniProt database. The predicted complexes with the most promising affinities were then subjected to molecular docking and molecular dynamics simulations to understand the contribution of each residue to the binding energy in the pocket. Results showed that the FLA-I H locus (in particular alleles H-*00401, H-*008012 and H-*00701) is largely responsive to many epitopes deriving from spike and replicase proteins of the analyzed coronaviruses. Moreover, a sequence alignment of all predicted epitopes for the three loci revealed that repeated patterns of amino acids are preserved between the sequences with the best interaction scores. Even though certain epitopes were uniquely expressed by the proteins in exam, other epitopes were found on glycoproteins belonging to coronaviruses targeting other animals, suggesting a cross-reactivity to different antigens in cats. These preliminary findings can be exploited as a tool for the prediction of CoVs' sensibility in a wide number of species and also as a future perspective for the development of peptide vaccines able to activate the immune systems for untreatable diseases, like FIP.

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ARE FOOTBALL PLAYERS MORE PRONE TO MUSCLE INJURY AFTER COVID-19 INFECTION? THE "ITALIAN INJURY STUDY" DURING THE SERIE A CHAMPIONSHIP

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ABSTRACT

Introduction: Football was the first sport to resume competitions after the coronavirus disease 2019 (COVID-19) lockdown and promptly the hypothesis was raised of a potential relationship between the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection and musculoskeletal injuries in athletes. This study aimed to confirm the association between SARS-CoV-2 infection and muscle strain injury in a large population of elite football players and to investigate if the COVID-19 severity level could affect the risk of injury. Methods: A retrospective cohort study involving 15 Italian professional male football teams was performed during the Italian Serie A 2020–2021 season. Injuries and SARS-CoV-2 positivity data were collected by team doctors through an online database. Results: Of the 433 included players, we observed 173 SARS-CoV-2 infections and 332 indirect muscle strains. COVID-19 episodes mostly belonged to severity level I and II. The injury risk significantly increased after a COVID-19 event, by 36% (HR = 1.36, $CI_{95\%}$ 1.05; 1.77, *p*-value = 0.02). The injury burden demonstrated an 86% increase (ratio = 1.86, $CI_{95\%}$ 1.21; 2.86, *p*-value = 0.005) in the COVID-19 severity level II/III versus players without a previous SARS-CoV-2 infection, while level I (asymptomatic) patients showed a similar average burden (ratio = 0.92, $CI_{95\%}$ 0.54; 1.58, *p*-value = 0.77). A significantly higher proportion of muscle–tendon junction injuries (40.6% vs. 27.1%, difference = 13.5%, $CI_{95\%}$ 0.002%; 26.9%, *p*-value = 0.047) was found when comparing level II/III versus Non-COVID-19. Conclusions: This study confirms the correlation between SARS-CoV-2 infection and indirect muscle injuries and highlights how the severity of the infection would represent an additional risk factor.

Keywords:

COVID-19; football; muscle injury; risk factor; epidemiology

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ABSTRACT

From more than a decade it turned out that we are facing a crisis in science, the “replication crisis”. The international “Replica Study Group” was born with the aim of replicates independently high-profile in vitro studies on the effects of cigarette smoke and electronic nicotine delivery systems (ENDS) aerosol. Our primary goal was to establish the reliability of the results and the robustness of the conclusions of these studies. ENDS seems to be able reduce the health risks associated with chronic smoke exposure, and their potential benefits are the subject of intense scientific debate with results in the literature for and against this hypothesis. The “In vitro Replication study” project coordinates the Leading Center at CoEHAR with five academic laboratories in Indonesia, Oman, Russia, Serbia and USA and one academic affiliated laboratory in Greece. This team conducted an Inter-laboratory study for a duration of 4 years. During the life span of the project, we are testing the latest generation of alternative products to conventional cigarettes, to assess cell and tissue cytotoxicity, oxidation, mutagenicity and genotoxicity and informing academia and the public of the progress, aiming to contribute to the amelioration of local and international Tobacco Harm Reduction (THR) policies.

BIOGRAPHY

Massimo Caruso is a PhD in Respiratory Diseases, Assistant Professor in Biochemistry at the Department of Biomedical and Biotechnological Sciences and Researcher at the Center of Excellence for the acceleration of HArm Reduction (CoEHAR) of the University of Catania. In the early years of his career, his work focused on diagnostic and prognostic biomarkers in asthma and allergies. Over the past decade his interest has moved to assessing the harm induced by cigarette smoke in respiratory and other smoking-related diseases, also using cellular models. He is currently conducting studies on the toxicological impact of the electronic nicotine delivery systems (ENDS) for tobacco harm reduction in simple and complex cellular models. He is co-Principal Investigator of the multicenter study "REPLICA", which aims to replicate high-profile in vitro studies conducted by tobacco companies. He is working in different area related to tobacco harm reduction and ENDS, including respiratory diseases, cardiovascular diseases, oncology, validation of new in vitro and in vivo models, focusing on the effects of flavors and nicotine, and on ecotoxicology.

A PASSIVE MICROFLUIDIC PLATFORM FOR A PERSONALIZED THERAPY IN HGSOC PATIENT DERIVED ORGANOIDS

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ABSTRACT

Introduction
Every year, more than 140000 people die of ovarian cancer (OC) worldwide, making it the most mortal gynecological disease of western countries. The lack of specific markers and identifiable symptoms in the earliest stages makes OC extremely difficult to diagnose in time. In fact, in most cases it is diagnosed at an advanced stage leading to a 5-year survival rate lower than 45%.
Treatment consists of debulking surgery or neoadjuvant chemotherapy followed by interval debulking surgery, combined with poly-ADP ribose polymerase (PARP) inhibitors, which unfortunately remains not resolutive. Thus, in addition to the development of new drugs and innovative therapies, a key role could be played by the personalized therapy. In this way it is possible, by knowing in advance the patient's response to the drug, to tailor the therapy on each patient, reducing the therapeutic failure and increasing the patient's life expectancy. For an effective personalized therapy, however, a model that is able to replicate the parental tumor is required. Nowadays it is known, in fact, that organoids can replicate the histopathological features of the tissue from which they are derived [1]. Unfortunately, the methods utilized for the growth of organoids are not representative of the human body. Generally, organoids are cultured in a rigid structure, (the ECM) and under static conditions differently from the human body, which is an extremely dynamic system. A more realistic model can be developed by combining microfluidics technology with organoids. In this way, the laminar flow can better deliver nutrients, oxygen and essential metabolites into the inner core of the culture and in turn increasing the ability of organoids to growth and acquired the characteristics of the parental human tumor [2].

Theory and Experimental procedure

The Mimetas 2-lane OrganoPlate® consist of 384 well plate composed of 96 independent tissue culture chips in which the continuous media perfusion is provided by gravity mimicking blood flow and improving the nutrients, oxygen and metabolites exchange. Patient derived organoid (PDO) cultures were derived, under informed consent, from primary tumor or ascites of patients with high grade serous OC (HGSOC) and were characterized for PAX8, CA125, WT1 and P53 markers by IHC and then biobanked. Different flow conditions were tested in the microfluidic platform to find the better way to culture the PDO. HGSOC PDOs were seeded both in passive flow and static culture platforms measuring the cell viability every day for seven days and assessing the growth kinetics. Subsequently, PDOs were treated with carboplatin, paclitaxel, doxorubicin, Caelyx and ATRA (Pin1 inhibitor) for 96 hours. Thus, IC50s were calculated by resazurin staining, ATP based assay and DAPI/PI colocalization assays. Lastly, the drug penetration through the ECM was studied by measuring the quantity of FITC-labeled paclitaxel after treatment. Figure 1 shows the setup of the experiment.

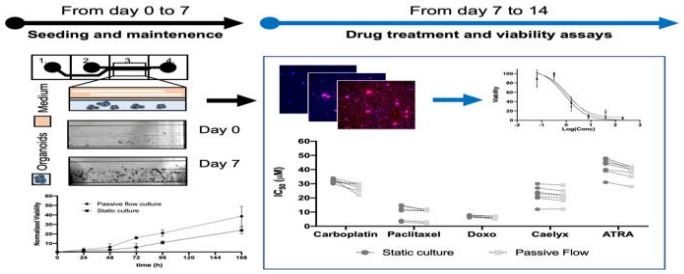

Figure 1. Flowchart: PDOs were seeded both in microfluidic platform and in 96-wells plates (day 0) and were maintained in culture until day 7. The viability was calculated, and the growth curves were established. PDOs were incubated with the drugs for 96 hours and then the cell viability was measured; the dose-response curves were established and IC_{50} values were calculated.

Results and Discussion

Under optimized perfusion flow conditions, HGSOC PDOs cultures grown at a higher rate than in static conditions reducing the number of dead cells over time. PDOs were treated with the drugs mentioned above for 96 hours in order to establish dose-response curves and IC50 were calculated. It was seen, that generally, IC50s were lower in microfluidic than in static cultures. By investigating the reason for this difference, FITC-labelled Paclitaxel were used to show that in passive flow cultures there is a better penetration of the drugs through the ECM compared to static conditions. In fact, the PDOs under flow conditions start to die after 48 hours of drug treatment instead of 96 hours in static conditions.

Conclusions

It has been developed a protocol for culturing HGSOC PDOs in the Mimetas 2-lane OrganoPlate® with a higher proliferation rate and a lower death rate compared to static cultures. In addition, it was demonstrated a better drug penetration in the ECM with microfluidic technology, and a reduction in the IC50 values. These data suggest that this passive microfluidic platform may be an effective model for doing personalized therapies due to its simplicity, easy to use and its compactness.

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THE INVESTIGATION OF CSF-1R SIGNALING PATHWAY IN MALIGNANT MESOTHELIOMA

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ABSTRACT

Malignant mesothelioma (MM) is an aggressive tumor of the pleura and peritoneum with limited effective curative options and an urgent requirement of new therapeutic targets [1]. Colony Stimulating Factor-1 Receptor (CSF-1R) is a tyrosine kinase receptor with a crucial role in the survival of myeloid lineage cells [2]. CSF-1R is activated in response to the binding of the ligands, IL-34 and M-CSF, that binds different region of the receptor and have shown different functions in the phenotype and activity of myeloid cells [3]. Recently, a non-macrophage function of CSF-1R was reported in tumors [4,5]. Previous studies have shown that MM has higher levels of CSF-1R expression than normal tissue, which is linked to pro-tumorigenic actions and a poor prognosis for MM patients [6,7].
By studying the CSF-1R signaling in MM, we found that only a small subset of cells expressed CSF-1R and, interestingly, the most aggressive histotype had higher CSF-1R expression levels. In addition, the cell growth and the proliferative index increased as result of CSF-1R activation. The highest CSF-1R expression was seen in G1-S phase synchronized cells, suggesting a potential involvement for the receptor in cell proliferation and fine regulation throughout the cell cycle phases. In fact, the percentage of cells entering the S-phase was lowered by the pharmacological inhibition of the CSF-1R kinase activity. Moreover, the primary mitogenic signaling pathways, like the activation of ERK5 and AKT, were reduced in response to CSF-1R blockade.
The characterization of the cell subset expressing CSF-1R and the process regulating its expression and activity during the S phase required to be better investigated, to provide a rationale for targeting CSF-1R pathway in MM. It also remains to analyze if the CSF-1R ligands exert different biological activity and signaling activation on MM cells.

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BIOGRAPHY

Francesca Cersosimo is an Italian PhD candidate in Genetic, Oncology and Clinical Medicine at the University of Siena, Italy. She has started her PhD after master's degree in Medical Biotechnology at the University of Siena, Italy, under the supervision of Professor Emanuele Giurisato. Her research is focused on the signaling pathways in cancer cell and the molecular mechanisms regulating the interactions within tumor microenvironment. Francesca arrived in the United States in July 2022 as an exchange student at Temple University's Sbarro Health Organization Center, where she is involved in the study of the CSF-1R in Mesothelioma.

LOCALIZATION OF GHRELIN IN TESTES OF MICE ADMINISTERED ORALLY WITH LEPIDIUM MEYENII (MACA), AND WITH TETRAHYDROCANNABINOL CHRONIC EXPOSURE

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Key words: Tetrahydrocannabinol (TC); Maca; Lepidium meyenii; testes, mouse; ghrelin.

ABSTRACT

A previous study of ours highlighted how prolonged exposure to cannabinoids induced negative effects of Tetrahydrocannabinol (THC) on testicular morphology and spermatogenesis. This picture may depend on the modulation of cannabinoid receptors that are present on Sertoli and Leydig cells but also by molecules with endocrine or paracrine action such as ghrelin that influence the balance of molecular signaling and nurturing of the microenvironment. Lepidium meyenii Walp (Maca), is a crop harvested exclusively between 3500 and 4500 m above sea level in the Andes highlands of and recognized to have antioxidant power and ability to improve both male and female reproductive functions, in humans and animals. Several are the ecotypes depending on crop's color, the most used are the yellow, red and black ecotypes.

The aims of the present study were to assess if the morpho-structural aspects of mouse testes, already highlighted in previous studies, were confirmed in this experimental model, and to evaluate the presence of ghrelin and its receptor in mouse testicular tissue following the treatment with THC and/or Maca (Yellow ecotype) by immunohistochemistry and Western blotting analyses. To these aims, twenty-four C57BL/6 male mice of 6 weeks of age were included in the study and divided in four groups of five animals each one, as follow: C, control group, with no treatment; THC group received 10 mg/kg per day of Δ 9 THC in 0.1 ml of sesame oil subcutaneously for 30 days; Maca group received 50 mg/kg per day of Maca via oral administration for 30 days; THC/Maca group received THC and Maca with the same modalities of the THC and Maca groups respectively, for 30 days.In all testes examined, Western blotting analysis highlighted the presence of ghrelin, in particular we observed a band whose molecular weight was similar to that of the corresponding prepro-ghrelin (approximately 20 kDa), and its receptor (40 kDa). Immunohistochemistry study on mouse testis showed the presence of ghrelin localized in Leydig cells in all study groups. The THC/Maca group is the one which, compared to the other groups of treated mice, also showed immunopositivity in Sertoli cells. From the data that emerged, it is probable that ghrelin plays a role in the modulation of androgen hormone production at the Leydig cell level, and that ghrelin localized in Sertoli cells of the THC/Maca group may favorably influence spermatogenesis.

COGNITIVE IMPAIRMENT AFTER MECHANICAL THROMBECTOMY: A CONSEQUENCE NOT TO BE UNDERSTIMATED

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ABSTRACT

TITLE: Cognitive Impairment After Mechanical Thrombectomy: A Consequence Not To Be Underestimated.

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Objectives: basal ganglia infarction is detectable after a successful mechanical thrombectomy for middle cerebral artery occlusion, due to their selective vulnerability to ischemic insults. While the motor outcome of these patients is often good, more knowledge is needed about the cognitive outcome. Our study aims to investigate the presence of cognitive impairment within one week after thrombectomy.

Materials: one week after the thrombectomy, 43 subjects underwent a cognitive assessment using Montreal Cognitive Assessment (MoCA) and an extensive neuropsychological battery evaluating memory, visual praxis, attention, executive functions, and language.

Methods: Patients were classified as cognitively impaired (CImp) or not (noCImp) according to a MoCA score below 18.

Results: CImp amounted to 60.5%. CImp and noCImp differed neither in their NIH-Stroke Scale (NIHSS) at admittance and in ASPECT score, but they did in age ($p=0.028$), modified Rankin Scale (mRS) at admittance ($p=0.037$) and in Fazekas scale ($p=0.020$). At discharge, CImp showed higher scores than noCImp on NIHSS ($p<0.001$) and mRS ($p<0.001$). Compared to noCImp, CImp showed worse performances in all neuropsychological tests, with higher impairment in ratings of executive and attention functions.

Discussion & Conclusions: the entire sample showed CT/MRI lesions involving the basal ganglia after a successful procedure, confirming the particular susceptibility of the basal ganglia to ischaemic damage. Older age correlated with worse neurological outcomes; higher mRS at admittance predisposed to a greater likelihood of developing it after stroke. The same applies to chronic vascular leukoencephalopathy. Interestingly, the cognitive profile resembles the defects observed in other conditions involving basal ganglia, such as Parkinson's Disease and Vascular Dementia.

BIOGRAPHY

Education:

2012/2018 Degree in Medicine and Surgery
Università degli Studi di Perugia, Perugia - Italy

2016 XVIII Neuroanatomy and Tractography Workshop: Neuroanatomy and Neuroradiology
Natbrainlab - King's College - London, UK

2017 Neuroanatomy and Tractography Internship: Neuroanatomy and Neuroradiology
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2019 Medical License
Università degli Studi di Perugia, Perugia – Italy

Professional Experience:

2019 Physician
Campolongo Hospital S.p.A, Marina di Eboli (SA) - Italy

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Università Cattolica del Sacro Cuore / Fondazione Policlinico Gemelli IRCCS, Rome - Italy

Therapeutic areas and clinical research experience:

- Neurodegenerative diseases
- Movement disorders
- Neurovascular/stroke
- Neuroimaging.

BIOINFORMATICS TOOLS TO INTEGRATE AND UNDERSTAND MOLECULAR CHANGES ASSOCIATED WITH IMMUNE RESPONSE, STEMNESS AND ONCOGENIC PROCESSES: A PANCANCER STUDY

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ABSTRACT

Recently, The Cancer Genome Atlas (TCGA's) Pan-Cancer Atlas initiative presented a comprehensive collection of 27 studies covering 11,000 patient tumors from 33 cancer types. These studies investigated cancer complexity from different angles by integrating multi -omics and clinical data. In particular, computational analyses have led to the identification of 299 cancer-driver genes and over 3,400 driver mutations. However, it still remains critical to clarify the consequences of each alteration and the underlying biological effects. In order to deal with the challenges of data retrieval and integration, TCGAbiolinks (Colaprico et al., NAR, 2016) has been developed to provide a pioneering bioinformatics solution to retrieve data from TCGA, CPTAC, GTEx, GEO and IHEC, respectively. Tumor-specific cancer-driver-gene events and downstream impact can be elucidated with MoonlightR by integrating these datasets (Colaprico et al., Nat Comm, 2020). We have been used successfully TCGAbiolinks and MoonlightR in multiple studies for oncogenic processes identification (Ding et al., Cell, 2018), oncogenic clinically actionable driver genes discovery (Bailey et al., Cell, 2018), comprehensive immune landscape characterization (Thorsson et al., Immunity, 2018), and to pinpoint cell-of-origin differences based on stemness score associated with oncogenic dedifferentiation (Malta et al., Cell 2018).

BIOGRAPHY

Antonio Colaprico, Eng, Ph.D is currently Associate Scientist in the Department of Public Health Sciences and Sylvester Comprehensive Cancer Center, University of Miami Miller School of Medicine, Miami, FL, USA.
Dr. Colaprico holds a Bachelor's and Master's degree in Telecommunication Engineering in 2005 and 2011, respectively, and a Ph.D. in Bioinformatics (2014) both from the University of Sannio, Benevento, Italy.
He was formerly a postdoc fellow at Machine Learning Group, Université Libre de Bruxelles, Bruxelles, Belgium. His research activities are focused on the development of innovative integrated bioinformatics methods and applications with the aim of modeling complex systems in biology and improving molecular diagnosis.
Dr. Colaprico has authored more than 40 scientific articles with a current h index of 28 and 11524 citations for a total of 926 Impact Factor.
Results of his studies have been published as first and co-author in high ranked journals including Nature Communications, Nucleic Acid Research, Cell, Cancer Cell, Immunity, Cancer Discovery, and presented at meetings and conferences including the U.S. NIH-NCI's The Cancer Genome Atlas Program (TCGA) and the NIH-NCI's Clinical Proteomic Tumor Analysis Consortium (CPTAC).
Recently his publication (Lehmann-Colaprico et al., Nat Comm, 2021) about therapeutic vulnerabilities in TNBC has been listed as part of 2021 top 25 health science articles among 7362 published ones.

SIRTS AS PROGNOSTIC BIOMARKERS IN MALIGNANT PLEURAL MESOTHELIOMA

Antonino Colloca
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ABSTRACT

Background: Malignant pleural mesothelioma (MPM) is a highly aggressive and rare malignancy. The most important etiological risk factor is represented by asbestos exposure, since asbestos accumulation leads to malignant transformation. Beyond asbestos, the epigenetic mechanisms play a pivotal role in MPM onset development suggesting the possibility to intervene via epigenetic regulators as a novel therapeutic approach. Key epigenetic regulators are represented by sirtuins, a family of deacetylases involved in several cellular processes, from DNA repair to mitochondrial energetic homeostasis. Previous data have demonstrated a double involvement of sirtuins in controlling mesothelioma cells death and survival via autophagy modulation in response to cellular stress and DNA damage, however, to date, their role is still to be fully elucidated.
Aims: The main aim of the present study is to assess the potential prognostic role of SIRT1, SIRT2, SIRT3, SIRT4, SIRT5, SIRT6, SIRT7 in MPM.
Methods: A series of 59 formalin-fixed, paraffin embedded (FFPE) samples of MPM was collected. The evaluation of sirtuins expression is being assessed through immunohistochemical analyses on Tissue Micro Arrays (TMA). Further molecular analyses will follow to allow an accurate characterization of these epigenetic biomarkers and their association with clinical and pathological features in MPM.
Results: Data obtained from immunohistochemical analysis performed on TMAs evidenced SIRT1 positive expression in 34% of the studied samples. Interestingly, SIRT1 positivity was found in samples characterized by more aggressive pathological features.
Conclusions: The observation that SIRT expression can be correlated to specific prognostic MPM features strongly prompts to furtherly investigate the molecular pathways involved that could pave the way to design novel specific targeted approaches in MPM.

BIOGRAPHY

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Co-tutored and guided by:
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ROLE OF LIPIDS IN HYDROPHOBIC GATING AND BLOCKER AFFINITY IN BK CHANNELS

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ABSTRACT

The large-conductance, calcium-activated potassium (BK) channel lacks the classic intracellular bundle-crossing gate observed in most other ion channels of the 6TM family. This observation, initially inferred from closed-pore accessibility experiments and recently corroborated by a cryo-EM structure of the non-conductive state, raises naturally a puzzling question: how can gating occur in absence of steric hindrance? To answer this question, we combined electrophysiology and molecular simulations and investigated the kinetics BK inhibition by two pore-blockers. The crux of our strategy was to leverage the state-dependent affinity of the binders to probe the physical properties of the pore. We thus combined kinetic modeling with a series of accurate free energy calculations to obtain a microscopic picture of the sequence of events taking place during the open-to-closed transition and giving rise to a nonconductive state. Our results highlight an unexpected role for annular lipids, which turn out to be an integral part of the gating machinery. Due to the presence of fenestrations, the closed-state pore is transiently occupied by some of the methyl groups from the lipid alkyl chains. This dynamic and intermittent occupancy triggers liquid-vapor oscillations and thus dewetting of the pore. Importantly, this lipid-mediated hydrophobic gating rationalizes several seemingly problematic experimental observations, including the state-dependent pore accessibility of blockers.

RED ORANGE AND LEMON EXTRACT AMELIORATES THE RENAL TOXICITY EFFECT INDUCED BY OCHRATOXIN A THROUGH THE MODULATION OF ROS ACCUMULATION AND NF-KB SIGNALLING

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ABSTRACT

Introduction: Ochratoxin A (OTA) is a toxic agent that increases the production of reactive oxygen species (ROS) and causes oxidative stress (1). Natural antioxidants have been shown to be effective at preventing kidney damage (2). As a result, the current research aimed to assess the renal protective impact of a Red orange and Lemon Extract (RLE) on OTA-induced renal damage via the modulation of ROS generation and NF-kB signalling.
Methods: Sprague-Dawley rats were divided into four experimental groups and gavage-treated for 14 days as follows: (a) Controls; (b) OTA (0.5 mg/kg b.w.); (c) RLE (90 mg/kg b.w.); and (d) OTA Plus RLE. At the end of the treatment, the animals were sacrificed and kidneys were collected for the planned experiments. The activity of superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GSH) as well as lipid peroxidation in kidney samples were measured colorimetrically by a spectrophotometer. To evaluate the expression of NF-kB, the RNA was extracted from tissue samples and the cDNA was measured by the RT-PCR Real-Time method. Furthermore, western blot analysis was performed to evaluate the NF-kB protein expression.
Results: A significant restore in GSH activity respect to the OTA group was observed in RLE plus OTA group ($p<0.001$). OTA increased the MDA levels respect to the control group but RLE with OTA showed a significant decrease in MDA levels compared to the OTA group ($p<0.001$). Moreover, the gene expression of NF-kB in renal tissue samples of OTA group were increased respect to control group and treatment with RLE significantly reduced the NF-kB protein expression ($p<0.05$) and western blot data were supported by the real time results.
Conclusion: The antioxidant properties of RLE may be effective treatment strategy to prevent OTA renal damage, through the inhibition of NFkB1 signalling pathway.

1. Malir F et al. *Toxins*. 2016 ;8(7):191. doi: 10.3390/toxins8070191.
2. Longobardi C et al. *Toxins*. 2022;14(6):398. doi: 10.3390/toxins14060398

BIOGRAPHY

Associate Professor in Veterinary Pharmacology and Toxicology, Department of Veterinary Medicine and Animal Productions, University of Naples, Federico II. Research Topics: • Oncolytic virus therapy • Innovative therapeutic approaches in the treatment of neoplastic diseases. • Veterinary oncology and anticancer chemotherapy. • Studies on xenobiotic molecular and cellular toxicity. • Evaluation of the effectiveness of natural molecules with antioxidant activity in the kidney disease and environmental contaminants • Evaluation of the efficacy of immunostimulating molecules in the prophylaxis of infectious diseases. Bibliometric Indicators related to Publications and Citations: Citation report: 43 publications (articles, reviews) Citation report: • sum of the times cited: 682 • Hirsch index (H-index): 16

PREVENTIVE AND ANTIPROLIFERATIVE EFFECTS OF TOMATO EXTRACTS ON COLORECTAL CANCER

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ABSTRACT

Colorectal cancer represents the third most common cancer and the fourth cause for cancer death in both sexes worldwide. Different epidemiological and observational evidences strictly correlated the risk of colorectal cancer to lifestyle, especially to diet. Numerous studies have investigated the effect of antioxidant substances derived from food but data on lycopene or tomato extracts are still rare. This project is based on comparing the effects of extracts (total and lipophilic fractions) obtained from fresh tomato of one tomato cultivar (corbarino) versus another tomato variety (tangerino), this latter known to have lycopene already in bioactive isoform. Using two colorectal carcinoma cell lines we previously investigated the ability of tomatoes to inhibit cancer cell growth and proliferation and hypothesized a selective action on cancer cells and a lack of an effect on non-cancer cells (normal human fibroblasts). We noticed a major effect of tangerino tomato extracts, particularly of total fraction. These data made us hypothesize a possible effect of tomato extract on cell cycle. We analyzed cell cycle progression by flow cytometry. Data obtained showed that there are not great differences between treatment and control, but we noticed different peaks in sub G0/G1 phase, suggesting a possible cellular death via apoptosis. At the molecular level, we found variation in the expression of different proteins (RBL1, RBL2, pAKT, $p21^{cip1}$, $p27^{kip1}$, etc) involved in different cellular mechanisms. Based on the known anti-inflammatory effect of lycopene, we also performed a western blot for IL6 and IL10 to understand if tomato extracts have an impact on the inflammation process. Data showed a reduction of IL6 and a small increase of IL10 levels, compatible with an anti-inflammatory action.

WHY DO SENESCENT CELLS EITHER BLOCK OR PROMOTE CANCER GROWTH? EVIDENCES SUGGEST THEIR SECRETOME CONTAINS TWO MAIN COMPONENTS: ONE ACTS IN AUTONOMOUS WAY TO BLOCK CANCER GROWTH, THE OTHER COOPERATES WITH IMMUNE CELLS TO FOSTER CANCER

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5- UniCamillus, Rome, Italy
6- Sbarro Institute for Cancer Research and Molecular Medicine, Center for Biotechnology, Temple University, Philadelphia, PA, USA.

ABSTRACT

Summary

Senescent cells change their metabolism and lysosomal activity and secrete numerous factors, collectively indicated as senescence-associated secretory phenotype (SASP). The beneficial effects of senescence (anti-cancer properties, wound healing, contribution to tissue development) are due to SASP produced by senescent cells not into their final stage, while negative senescence outcomes (cancer promotion, aging) are mainly due to pro-inflammatory SASP activity. We induced senescence of mesenchymal stromal cells (MSCs) by X-ray treatment and evaluated as SASP changed its composition over time and noted how these modifications affected its biological activities. Proteome and bioinformatics analysis allowed us to identify the main functions and pathways implemented in SASP obtained from MSCs 10, 30, and 60 days post-irradiation. We observed a significant enrichment in pro-inflammatory factors in SASPs from late senescent cells.

Having evidenced significant changes in secretome composition during progression of senescence, we aimed to ascertain how these modifications affected the SASP paracrine functions. We focused our attention on the SASP capacity to arrest the growth of tumor cells by inducing senescence and/or apoptosis. The SASP preserved its anti-tumor properties at all examined time points, even at late senescent stage. Our results suggest that SASP always contains some core components that have an anti-tumor activity, and the progression from early to late senescence enriches that of pro-inflammatory factors that may promote SASP tumorigenic activity only by interacting and instructing cells of the immune system. Indeed, the SASP anti-tumor properties on Caco-2 cancer cells was heavily impaired by the presence of peripheral mononuclear cells.

SILENT SARS-COV2 MYOCARDITIS PRESENTING WITH VENTRICULAR ARRHYTHMIAS IN MASTER ATHLETE: A CHALLENGING CASE

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Ph.D., Cultore della materia per l'insegnamento di Patologia Sistemica II nel corso di laurea in Medicina e Chirurgia, presso l'Università di Perugia. Incarico a tempo indeterminato, tempo pieno, come dirigente medico presso la struttura di Cardiologia riabilitativa e prevenzione patologie cardiovascolari, Centro Servizi Grocco, Perugia. Cultore della materia per l'insegnamento di Malattie dell'Apparato Cardiovascolare nel Corso di Laurea Magistrale in Scienze Infermieristiche e Ostetriche presso l'Università di Perugia

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ABSTRACT

We present the case of a 52-year-old male master athlete, with a known history of sporadic ventricular ectopics.
Within a few months, between 2021 and 2022, the patient was infected twice by SARS-COV2, experiencing cough, fever and myalgia. Since then, he began to experience an increase in the frequency of previously felt extrasystoles.
For this reason, he underwent a cardiological evaluation, during which the ECG reported frequent ventricular ectopics, in the context of sinus rhythm and left anterior hemiblock; the echocardiogram showed: left ventricle (LV) normal in size and function; right sections normal, minimal mitral regurgitation, no pericardial effusion.
After that, the patient was investigated with 24h ECG which confirmed the presence of frequent ventricular ectopics (12,000/24h, 12% of burden) with left bundle branch block morphology; subsequently an ergometric test was performed, which documented persistent ectopic beats even during physical exertion, and finally, the patient underwent a cardiac magnetic resonance (MRI); after administration of Gadolinium, MRI showed limited and blurred areas of late gadolinium enhancement (LGE) in the LV basal lateral wall with meso-myocardial distribution, a thin strip of LGE at the posterior basal-mid septum with meso-subepicardial distribution, an area of LGE at the level of lower basal wall, near the insertion of the right ventricle (RV) with meso-myocardial distribution; normal size and function of the LV. RV of slightly increased volumes with normal systolic function.
The case appeared to us as rather complex to resolve; moreover, we did not have MRI data prior to the SARS-COV2 infection as comparator; given the clinical event of viral infection, we thought to consider LGE as a consequence of fibrosis secondary to an unrecognized myocarditis occurred during the SARS-COV2 infection. Of note, the earlier history of ectopics could have been misleading, although a significant increase in burden was documented, along with persistence during exercise.
Although we do not consider useful to indiscriminately search for cases of myocarditis among patients who have had a SARS-COV2 infection, this case is an example of how, in the presence of suggestive clinical elements, it could be pivotal to carry out diagnostic investigations to reach the correct diagnosis.

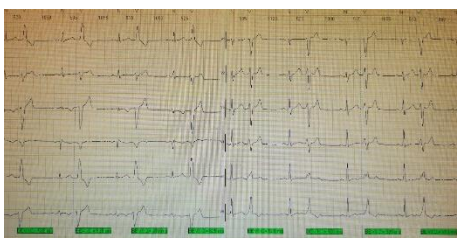

Fig. 1: ECG

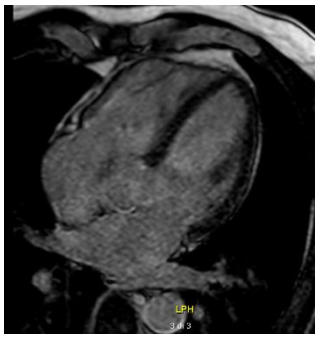

Fig 2: Cardiac MRI: late Gadolinium enhancement in basal lateral wall

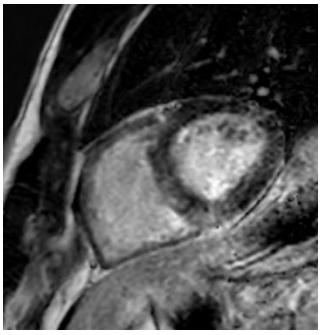

Fig. 3: Cardiac MRI: late Gadolinium enhancement in mid septum

BIOGRAPHY

Cultore della materia per l'insegnamento di Patologia Sistemica II nel corso di laurea in Medicina e Chirurgia, presso l'Università di Perugia

Incarico a tempo indeterminato, tempo pieno, come dirigente medico presso la struttura di Cardiologia riabilitativa e prevenzione patologie cardiovascolari, Centro Servizi Grocco, Perugia

Cultore della materia per l'insegnamento di Malattie dell'Apparato Cardiovascolare nel Corso di Laurea Magistrale in Scienze Infermieristiche e Ostetriche presso l'Università di Perugia

Frequenza come discente presso Master universitario di II livello in Ecocardiografia transesofagea, ecografia da stress ed avanzata, presso l'Università degli studi di Padova

OXIDOREDUCTIVE BALANCE EVALUATION IN WILD BOARS (SUS SCROFA) CONTAMINATED BY ZEARALENONE (ZEN)

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ABSTRACT

Introduction: The problem of residue of substances with potentially toxic effects, such as mycotoxins, in food has taken on considerable importance in terms of food safety. Wild boar is an excellent species as biological indicator for the detection of mycotoxins in wild meat, both because of its eating habits and because of its wide distribution. In recent years, we have witnessed an increase in the population and habitat of wild boars in many mountainous and hilly areas of Italy, including the Campania region because of global climate change. This condition has led to an increase in temperature and humidity, which favors the development of fungi on various food crops, especially cereals. Zearalenone (ZEN) is a mycotoxin produced by fungi belonging to the genus Fusarium spp., it is commonly found in feed and food and is known for its frequently implication in reproductive disorders in farm animals and, occasionally, in hyperestrogenic syndromes in humans. This study investigated the effect of ZEN on the oxidative state in wild boars, which now represent one of the most hunted game species in Italy, both for the type of hunting involved and for the delicacy of the meat.
Materials and Methods: ELISA immunoassays were used to evaluate the activity of glutathione peroxidase (GPx), superoxide dismutase (SOD), catalase (CAT) and malondialdehyde (MDA) activities in liver, kidney and muscle samples taken from wild boars regularly killed in their habitat by hunters in different locations in the province of Avellino, Campania region, Southern Italy, during 2021-2022. Histological sections were stained with hematoxylin and eosin and were examined by an optical microscope (Nikon Eclipse E600) coupled with a microphotographic system (Nikon DMX1200 digital camera).
Results: In the present study, ZEN induced an increase in liver and kidney activity of GPx and CAT enzymes. An increase in MDA content was detected mainly in the livers of wild boars positive to ZEN. Histological data evidenced diffuse inflammatory and degenerative processes.
Conclusion: This study demonstrated that ZEN induces oxidative stress and the histopathological alterations confirm its toxicity.

BIOGRAPHY

Longobardi Consiglia: PhD in Medical Clinical and Experimental Sciences and Research Fellow at the Department of Veterinary Medicine and Animals Productions, University of Naples "Federico II". Research topics: intestinal microbiota, oncolytic virus therapy, innovative therapeutic approach against neoplastic diseases, evaluation of environmental contaminants, efficacy of products of natural origins for the prophylaxis and therapy of kidney diseases. Bibliometric Indicators related to Publications: 13 publications and H-index=6.

ADENOSINE PATHWAY AS A PROGNOSTIC BIOMARKER AND AN ACTIONABLE TARGET TO OVERCOME "IMMUNE ESCAPE" OF HUMAN TUMORS: THE MESOTHELIOMA MODEL

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ABSTRACT

Malignant pleural mesothelioma is an aggressive cancer and, for this disease, chemotherapy, surgery and radiotherapy are not curative. During the last years, numerous of studies have focused on immune therapies exploiting the use of immune checkpoint inhibitors. So far, these treatments are based on the use of molecules that inhibit proteins and receptors such as PD-1, PD-L1 and CTLA-4 [1]. Thus, there is the urgent need to find other immune targets. The purinergic pathway is a field of great interest as in fact there is evidence that the hypoxic environment of tumors induces increased expression of CD73 and CD39 (enzymes that produce adenosine starting from ATP) which promote the increase in extracellular adenosine [2]. High levels of adenosine are characteristic of the tumor microenvironment and induce immunosuppressive signals promoting growth and progression of tumors. For this reason [3], inhibitors of the purinergic pathway drawing attention to restore immune response to cancer cells. Our study is aimed at the identification of adenosine pathway members in MPM tissue and if this same pathway is active in this tumor. We have detected high expression of the Adenosine receptors and CD73 in MPM cells. Accordingly, treatment with the A2Br antagonist (MRS1754) provided the evidence that adenosine signaling is active in MPM cells and is a potential novel druggable target against MPM.

REMOVAL OF SIV PROVIRAL DNA FRAGMENTS BY CRISPR FROM BLOOD AND LYMPHOID CELLS OF LIVING ART TREATED NON-HUMAN PRIMATES

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ABSTRACT

Our research group successfully utilized CRISPR/Cas9 gene editing to excise HIV-1 genome from latently infected human cells. To test our approach in a preclinical setting, we developed a similar strategy for SIV. We utilized a bioinformatics tool to identify a pair of nucleotide sequences in order to originate a pair of gRNAs with the highest predicted on-target and lowest scores for off-target cleavage within the 5' LTR and Gag gene of SIVmac239. Then, we employed AAV-9 as a vector to deliver CRISPR/Cas9 designed to target sequences spanning the LTR and Gag genes and permanently inactivating proviral DNA. In our study, 8 adult Chinese rhesus macaques male were intravenously (i.v.) infected with SIVmac239. At 8 weeks post infection, animals were treated daily with a drug regimen of tenofovir disoproxil fumarate, emtricitabine and dolutegravir. Then, ex vivo gene editing was performed in PBMCs by AAV9-CRISPR/Cas9 transduction, PCR amplification and Sanger sequencing of the amplicons to assess the potency and precision of viral DNA elimination. Moreover, we performed an in vivo proof of concept study on 4 animals, 3 were given an i.v. infusion of AAV-9-CRISPR/Cas9 and after 3 weeks, animals were necropsied and blood and tissues were harvested for virological and gene excision evaluations. In all SIV-infected animals, ex vivo excision of viral DNA was confirmed by the detection of distinct DNA fragments of 465bp and 358bp resulting from the removal of intervening DNA sequences between 5'LTR to Gag and Gag to 3'LTR, respectively. Delivery was confirmed by the presence of Cas9 and expression of both gRNAs and results from Sanger sequencing confirmed the breakpoint of the viral DNA. In vivo, both excisions were confirmed in blood and tissues of animals that received AAV-9-CRISPR/Cas9 infusion.

BIOGRAPHY

OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 09/30/2024) BIOGRAPHICAL SKETCH Provide the following information for the Senior/key personnel and other significant contributors. Follow this format for each person. DO NOT EXCEED FIVE PAGES. NAME: Mancuso, Pietro eRA COMMONS USER NAME (credential, e.g., agency login): MANCUSOP POSITION TITLE: Assistant Scientist EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.) INSTITUTION AND LOCATION DEGREE (if applicable) END DATE MM/YYYY FIELD OF STUDY University of Palermo, Italy M.Sc 03/2005 Molecular Biology University of Siena, Italy Ph.D. 04/2018 Genetic, Oncology and Molecular Medicine Lewis Katz School Of Medicine, Temple University, Philadelphia, PA Postdoctoral 10/2021 Translational AIDS Research A. Personal Statement I received a Master's degree in Biological Sciences in 2005 with an emphasis on molecular biology. After receiving my degree, I began working in the field of Developmental Biology and Neuroscience (2005-2010) and also Cancer Biology and Epigenetics (2011-2015), during which time I developed an strong interest in utilizing a gene targeting approach to treat disease. I then pursued my PhD in Genetics, Oncology & Clinical Medicine at the University of Siena and received my PhD in 2018. My most recent projects and publications (2016-2020) are focused on the gene-editing and virology. Before starting my university studies I served in the Air Force in Italy. My initial academic training and first experiences with research and lab techniques were in 2004 at the Catholic University of the Sacred Heart in Rome in the laboratory of Dr. Giovanni Scambia, my thesis supervisor in the Department of Obstetrics and Gynecology , where I performed my first bench work and learned some basic techniques such as the phage preparation, DNA and RNA isolation and also the PCR analysis for the detection of human beta2-microglobulin on samples harvested from sheep peripheral blood, heart, skeletal muscle, lung, brain, and spinal cord under his mentorship. Those skills were very useful for Master's thesis dissertation, which focused on an ovine experimental model of prenatal intracelomatic transplantation of human stem cells taken from the cord blood within pre-immune fetal lambs, to evaluate the feasibility and the engraftment percentage value. In 2005, I joined Dr. Antonio Simeone's research team initially at King’s College in London, UK and then in Naples, Italy at the CEINGE - Advanced Biotechnologies Institute, where I worked in the field of developmental biology studying Otx1 and Otx2 genes, which play key roles in sense organ development and brain morphogenesis, regionalization and patterning, and I was involved as a fellow in a project focused on the role of Otx2 in the control of identity and fate of neuronal precursors in the mesencephalon and in the midbrain. Moreover, I investigated the conditional down- and upregulation of Otx genes in transgenic mouse models using the En1-driven Cre recombinase, in order to study in detail the consequences of the lacking or overexpression of the above mentioned genes in different pathways. This represented my first scientific contribution to a high impact factor journal related to Parkinson’s disease. I learned many new techniques for the preparation of this manuscript, including staining and fixation of the slides for immunofluorescence, immunohistochemistry and morphological analysis. Moreover, I started learning how to breed mice in order to generate new models and how to verify their strain by PCR genotyping, a crucial skill for the in vivo identification of both DNA target genes and Otx2 protein partners. After my experience in Naples, I accepted a fellowship in 2009 in Palermo, in the Laboratory of Cellular and Molecular Physiopathology at the Department of Surgical and Oncological Sciences under the direction of Dr. Giorgio Stassi, where I had the chance to enrich my knowledge in tumor biology and become familiar with cell culture, and advanced isolation and purification techniques for normal and cancer stem cells, studying the mechanisms underlying the molecular events of self-renewal and survival in cancer stem cells derived from breast, colon and thyroid cancers and also from melanoma. Specifically, I was involved in a project aimed at characterizing the colorectal cancer stem cell population and its ability to sustain tumor growth and progression that led to the migration from the primary site resulting in the generation of distant metastasis, through the identification of putative stemness markers, such as CD34, CD133 and also the nuclear beta catenin, and part of this study was published in Cancers and I shared first-authorship equally (Di Franco & Mancuso et al., Cancers, 2011). In 2012, I received a predoctoral student fellowship in the Institute Curie, Department of Normal and Pathological Development of Melanocytes, in Orsay, France

where I started working on melanoma under the supervision of Dr. Lionel Larue. I then had the opportunity to start a collaboration with his colleague Dr. Alfonso Bellacosa, who would be the co-mentor of my next project., Dr. Bellacosa also has impressive experience in the field of cancer and epigenetics at the Cancer Epigenetics Program at Fox Chase Cancer Center in Philadelphia.. At the suggestion of my mentors, I enrolled in the PhD program in Genetics, Oncology and Clinical Medicine at the Department of Medical Biotechnologies, at the University of Siena, Italy under the Supervision of Dr. Antonio Giordano, who is also the director of the Sbarro Health Research Organization care of Temple University, Philadelphia. My thesis project was aimed at analyzing the role of the base excision repair enzyme thymine DNA glycosylase (TDG) in melanoma using in vivo and cellular models and subsequently, I extended my investigation by identifying two TDG inhibitors that reduced viability and clonogenic capacity of melanoma lines through a high-throughput screening, preventing these cancer cells from proliferating, and at the same time, safeguarding the healthy cells, thus demonstrating an effective impediment to the growth of cancer in mice model. Specifically, I used a C8 lentivirus expressing an shRNA lentiviral construct against TDG to knock down TDG expression in melanoma cell lines and this study led to a first author publication in Oncogene I am also co-inventor of the US Patent granted on March 5, 2019 entitled “Combination of DNA repair inhibition with Bendamustine or Gemcitabine in the treatment of cancer” and I have generated additional data for the TDG inhibition in other cancer types beside melanoma and a related manuscript is scheduled for submission soon. In 2017, I began working in the laboratory of Dr. Kamel Khalili, a worldwide recognized pioneer in the field of Virology and Gene Editing with an outstanding record of milestones publications and NIH grants related to the JCV, HIV-1 and the CRISPR/Cas9 platform, as an Assistant Scientist in the Department of Microbiology, Immunology & Inflammation (formerly Dept. of Neuroscience) while I was in the drafting my thesis for my PhD defense. I adapted my previously acquired expertise in developmental biology and gene regulation to the study of a gene editing system based on the CRISPR/Cas9 platform, to achieve curative virus sterilization for HIV1 and SIV, targeting their genomes in order to pave the road for in vivo studies to eradicate the virus in a translational humanized mouse model and also in the Rhesus macaques where we demonstrated, as a proof-of-concept, that a single inoculation of our CRISPR gene-editing construct, carried by an adeno-associated virus, can edit out the SIV genome from infected cells in monkeys. The department of Microbiology, Immunology & Inflammation has been an outstanding center for my postdoctoral training and I will benefit greatly from the environment as I transition towards independenceand achieving my goal of a tenure track faculty position at a leading institution where I will be able to develop a research program investigating the relationship between cancer and virology, identify potential targets for active, preventative and effective intervention on aging and metabolic diseases. I believe that Temple University and Fox Chase Cancer Center represent the ideal and excellent locations for my scientific growth and career development as a successful independent investigator. 1. Mancuso P, Chen C, Kaminski R, Gordon J, Liao S, Robinson JA, Smith MD, Liu H, Sariyer IK, Sariyer R, Peterson TA, Donadoni M, Williams JB, Siddiqui S, Bunnell BA, Ling B, MacLean AG, Burdo TH, Khalili K. CRISPR based editing of SIV proviral DNA in ART treated non-human primates. Nat Commun. 2020 Nov 27;11(1):6065. PubMed Central PMCID: PMC7695718. 2. Mancuso P, Tricarico R, Bhattacharjee V, Cosentino L, Kadariya Y, Jelinek J, Nicolas E, Einarson M, Beeharry N, Devarajan K, Katz RA, Dorjsuren DG, Sun H, Simeonov A, Giordano A, Testa JR, Davidson G, Davidson I, Larue L, Sobol RW, Yen TJ, Bellacosa A. Thymine DNA glycosylase as a novel target for melanoma. Oncogene. 2019 May;38(19):3710-3728. PubMed Central PMCID: PMC6563616. 3. Bella R, Kaminski R, Mancuso P, Young WB, Chen C, Sariyer R, Fischer T, Amini S, Ferrante P, Jacobson JM, Kashanchi F, Khalili K. Removal of HIV DNA by CRISPR from Patient Blood Engrafts in Humanized Mice. Mol Ther Nucleic Acids. 2018 Sep 7;12:275- 282. PubMed Central PMCID: PMC6011019. 4. Acampora D, Di Giovannantonio LG, Di Salvio M, Mancuso P, Simeone A. Selective inactivation of Otx2 mRNA isoforms reveals isoform-specific requirement for visceral endoderm anteriorization and head morphogenesis and highlights cell diversity in the visceral endoderm. Mech Dev. 2009 Oct;126(10):882-97. PubMed PMID: 19615442. B. Positions, Scientific Appointments and Honors Positions and Scientific Appointments 2017 - Assistant Scientist, Ctr. for Neurovirology and Gene Editing, Dept. of Microbiology, Immunology & Inflammation, Lewis Katz School of Medicine, Temple University, Philadelphia, PA 2014 - 2018 PhD Student, Dept. of Genetics, Oncology & Clinical Medicine,University of Siena, Siena 2014 - 2015 Visiting Scientist, Cancer Epigenetics and Cancer Biology Programs, Fox Chase Cancer Center, Philadelphia, PA 2012 - 2014 Predoctoral Fellowship, Institute Curie, Department of Normal and Pathological Development of Melanocytes, Orsay 2009 - 2012 Fellowship, Department of Surgical and Oncological Sciences, Universita' di Palermo, Palermo 2005 - 2009

Graduate Fellowship, European School of Molecular Medicine c/o CEINGE - Advanced Biotechnologies Institute , Naples 2004 - 2005 Undergraduate Student, Catholic University of the Sacred Heart , Rome Honors 2018 Early Career Investigator Award, International Society for Neurovirology / Society on Neuroimmune Pharmacology, Chicago, IL 2014 Best Poster Presentation - 19th Annual Postdoctoral, Medical Resident/Fellow and Graduate Student Research Conference, Philadelphia., Fox Chase Cancer Center, Philadelphia, PA 2012 Fellowship Award, Insitute Marie Curie Orsay, France 2004 Undergraduate Fellowship, Ovarian Cancer Research Program, Policlinico A. Gemelli, "Dipartimento per la Tutela della Salute della Donna e della Vita Nascente", Rome, Italy C. Contribution to Science 1. I have been studying Otx1 and Otx2 genes, that represent the murine homologs of the Drosophila otd gene, which play an important role in controlling brain morphogenesis and cell fate. Specifically, I have investigated the role of Otx2, a transcription factor that plays a crucial role in specification, regionalization and differentiation of forebrain and midbrain, by analyzing mutant mice that conditionally overexpress or lack Otx2 using En1-driven Cre recombinase. I have provided evidence that Otx2 exerts a critical influence over mesDA neurogenesis by regulating the proliferating activity and differentiation of mesDA progenitors. Moreover, I showed that Otx2 is required to promote their differentiation by directly or indirectly activating the Lmx1a-Msx1-Ngn2 genetic cascade. These findings provided new insights into the regulatory mechanism that controls mesDA neurogenesis. Collectively, my studies contributed to a growing knowledge of the genetic networks required for proper mesDA development, thus disclosing new perspectives for therapeutic approaches of mesDA disorders and also suggesting Otx2 as a potential target for cell replacement-based therapeutic approaches in the treatment of Parkinson disease (PD). a. Simeone A, Puelles E, Omodei D, Acampora D, Di Giovannantonio LG, Di Salvio M, Mancuso P, Tomasetti C. Otx genes in neurogenesis of mesencephalic dopaminergic neurons. Dev Neurobiol. 2011 Aug;71(8):665-79. PubMed PMID: 21309083. b. Acampora D, Di Giovannantonio LG, Di Salvio M, Mancuso P, Simeone A. Selective inactivation of Otx2 mRNA isoforms reveals isoform-specific requirement for visceral endoderm anteriorization and head morphogenesis and highlights cell diversity in the visceral endoderm. Mech Dev. 2009 Oct;126(10):882-97. PubMed PMID: 19615442. c. Simeone A, Puelles E, Acampora D, Omodei D, Mancuso P, Giovanni Di Giovannantonio L. The role of Otx genes in progenitor domains of ventral midbrain. Adv Exp Med Biol. 2009;651:36-46. PubMed PMID: 19731548. d. Omodei D, Acampora D, Mancuso P, Prakash N, Di Giovannantonio LG, Wurst W, Simeone A. Anterior-posterior graded response to Otx2 controls proliferation and differentiation of dopaminergic progenitors in the ventral mesencephalon. Development. 2008 Oct;135(20):3459-70. PubMed PMID: 18820178. 2. I have demonstrated that inhibiting the base excision repair enzyme thymine DNA glycosylase (TDG), critical to cancer cell repair and proliferation, may represent a new potential strategy for treating melanoma. In fact, since TDG protein and mRNA are expressed in a panel of melanoma lines, at levels varying from low to high, and apparently inversely correlating with tumorigenic potential, I reasoned that the two non-redundant (genomic and epigenomic) functions of TDG may represent a vulnerability of tumor cells that can be exploited as novel targets for treatment, because targeting TDG may have the double effect of altering DNA repair capacity and also epigenetic state. To elucidate the mechanism by which TDG knockdown reduces cell proliferation, I analyzed the cell cycle profile and demonstrated that TDG knockdown reduces proliferation and induces cell cycle arrest and multinucleation. Moreover, I observed that TDG knockdown induces cells to senescence and confirmed my hypothesis by testing the senescence-associated β-galactosidase assay (SA-β-gal) that revealed positive staining. Most importantly, I showed in a statistically significant number of mice, using two different melanoma cell lines, that TDG knockdown reduces tumor growth in vivo. Eventually, using a DNA repair molecular beacon assay. I was also able to identify two first-generation TDG inhibitors and characterize their anticancer activity. The results of these studies are also conveyed in the approved US Patent# 10,220,051 B2, issued on March 5, 2019 entitled: "Combination of dna repair inhibition with bendamustine or gemcitabine in the treatment of cancer", on which I am a co-inventor. This invention provides methods for enhancing the cytotoxicity of DNA damage in cancer cells that express TDG, and treating tumors accordingly. The methods comprise inhibiting the expression or biologic activity of TDG, and inducing DNA damage in the cancer cells by administration of bendamustine or gemcitabine to utilize in combination with an effective amount of a specific TDG inhibitor selected from the group consisting of juglone, closantel, and cefixime, that I tested on melanoma and also on breast and pancreatic cancer. a. Mancuso P, Tricarico R, Bhattacharjee V, Cosentino L, Kadariya Y, Jelinek J, Nicolas E, Einarson M, Beeharry N, Devarajan K, Katz RA, Dorjsuren DG, Sun H, Simeonov A, Giordano A, Testa JR, Davidson G, Davidson I, Larue L, Sobol RW, Yen TJ, Bellacosa A. Thymine DNA glycosylase as a novel target for melanoma. Oncogene. 2019 May;38(19):3710-

3728. PubMed Central PMCID: PMC6563616. b. Henry RA, Mancuso P, Kuo YM, Tricarico R, Tini M, Cole PA, Bellacosa A, Andrews AJ. Interaction with the DNA Repair Protein Thymine DNA Glycosylase Regulates Histone Acetylation by p300. Biochemistry. 2016 Dec 13;55(49):6766-6775. PubMed Central PMCID: PMC5206798. 3.In order to test the ability of the CRISPR/Cas9 gene editing method for the elimination of the SIV viral genome, I performed an in vivo proof of concept study in Rhesus macaques, demonstrating for the first time that intravenous administration of AAV9-CRISPR in monkeys is capable of editing the SIV proviral DNA in the plasma and several lymphoid tissues of infected animals, and also precisely excises proviral DNA at the designated sites (Mancuso et al., Nat Commun. 2020). This represents a pioneer study which allowed our research group to initiate the clinical trials on human patients living with HIV-1. Specifically, I utilized a bioinformatics tools to identify a pair of nucleotide sequences in order to originate a pair of gRNAs with the highest predicted on-target and lowest scores for off-target cleavage within the 5' LTR and Gag gene of SIVmac239. Then, I applied a strategy employing the adenoassociated vector AAV-9 to deliver CRISPR/Cas9 designed to target sequences spanning the LTR and Gag genes and permanently inactivating pro-viral DNA by excising intervening DNA fragments. For that purpose, taking advantage of my previous skills in the HIV-1, I performed the cloning of sivLTR and sivgag gRNAs protospacers into pX601 AAV expression plasmid and also the testing of the above described construct in HEK293T SIVmac239 reporter cell line. Then, I performed ex vivo gene editing in PBMCs by AAV9-CRISPR/Cas9 transduction, followed by PCR amplification and digital droplet PCR analysis in order to evaluate the biodistribution of the SaCas9 and of both gRNAs from the CRISPR platform within the blood and tissues in treated animals and also the verification by Sanger sequencing of the amplicons, in order to assess the potency and precision of viral DNA elimination. a. Mancuso P, Chen C, Kaminski R, Gordon J, Liao S, Robinson JA, Smith MD, Liu H, Sariyer IK, Sariyer R, Peterson TA, Donadoni M, Williams JB, Siddiqui S, Bunnell BA, Ling B, MacLean AG, Burdo TH, Khalili K. CRISPR based editing of SIV proviral DNA in ART treated non-human primates. Nat Commun. 2020 Nov 27;11(1):6065. PubMed Central PMCID: PMC7695718. b. Dash PK, Kaminski R, Bella R, Su H, Mathews S, Ahooyi TM, Chen C, Mancuso P, Sariyer R, Ferrante P, Donadoni M, Robinson JA, Sillman B, Lin Z, Hilaire JR, Banoub M, Elango M, Gautam N, Mosley RL, Poluektova LY, McMillan J, Bade AN, Gorantla S, Sariyer IK, Burdo TH, Young WB, Amini S, Gordon J, Jacobson JM, Edagwa B, Khalili K, Gendelman HE. Sequential LASER ART and CRISPR Treatments Eliminate HIV-1 in a Subset of Infected Humanized Mice. Nat Commun. 2019 Jul 2;10(1):2753. PubMed Central PMCID: PMC6606613. c. Bella R, Kaminski R, Mancuso P, Young WB, Chen C, Sariyer R, Fischer T, Amini S, Ferrante P, Jacobson JM, Kashanchi F, Khalili K. Removal of HIV DNA by CRISPR from Patient Blood Engrafts in Humanized Mice. Mol Ther Nucleic Acids. 2018 Sep 7;12:275- 282. PubMed Central PMCID: PMC6011019. A Complete List of Published Work in MyBibliography https://www.ncbi.nlm.nih.gov/myncbi/1ZgNdflkaDG5O/bibliography/public/

ADENOSINE PATHWAY AS A PROGNOSTIC BIOMARKER AND AN ACTIONABLE TARGET TO OVERCOME "IMMUNE ESCAPE" OF HUMAN TUMOURS: THE MESOTHELIOMA MODEL

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ABSTRACT

Background

Malignant pleural mesothelioma (MPM) is a highly aggressive tumor and therapeutic protocols characterized by chemotherapy, surgery and radiotherapy are not curative. For some years, studies have focused on immune therapies, mainly exploiting the use of immune checkpoint inhibitors. Up to now, these innovative treatments have mainly been based on the use of molecules that inhibit proteins and receptors such as CTLA-4, PD-1 and PD-L1. The results in terms of survival and disease control rates have improved slightly and the research has shifted attention to other targets of the immune system, such as the purinergic pathway. The hypoxic environment of tumors has been shown to induce an increase in the expression of the enzymes CD39 and CD73 leading to an increase in extracellular adenosine. At supraphysiological levels, adenosine induces an immunosuppressive environment that promotes the growth and progression of tumors.

The aim of our study was assessing if molecules of the adenosine pathway are present in the tissues of the MPM and the purinergic signaling is active in these tumour cells.

M&M and Results. WB analysis of Adenosine receptors B and the ectonucleotidase CD73 result highly expressed on MPM cells whereas RT-PCR expression and IHC semi-quatitative analysis of the same molecules in MPM tissue were inversely related to survival. Moreover treatment of MPM cells with the Adenosine agonist NECA led to WB CREB phosphorylation with pro-proliferative effects on MPM spheroids. On the other hand MPM actively produced Adenosine and siCD73 decreased MPM cells expression of PDL1 on MPM cells and restored autologous CD4 proliferation cocultured with MPM

Conclusions. The purinergic pathway is active in MPM and is an attractive novel actionable target to treat this stubborn neoplasm

BIOGRAPHY

Prof Luciano Mutti, Training in Respiratory Medicine Genoa University, CCT, 1988, Respiratory medicine.
Turin University Ph.D in Oncology programme, Programme finalized, 1994, Medical Oncology. Traning Oncology NHS, CCT, 1993, Medical Oncology.
ERC, PhD eq, 1993,

Adj Professor Translational Oncology. Sbarro Institute for Cancer Research and Molecular Medicine, Department of Biology, College of Science and Technology, Temple University, PA , US
Professor Oncology and Head of the Dep of Oncology , University of L'Aquila , Italy
Past Chair in Cancer Research, Salford University, Salford, Greater Manchester, UK

As per my list of peer reviewed publications, my most relevant ability is bridging the gap between the preclinical and clinical activities. This approach covers several human tumors even though we have been addressing our efforts mainly toward thoracic malignancies and particularly MM. I have a long and successful experience as a leader of a big translational group of pre-clinical and clinical scientist working on this tumor and I have been contributing to European Guidelines for MM from 2010 to date. As a Director of the Scientific Committee of Buzzi Foundation for study and Therapy of MM and Head of Dept in Vercelli Teaching University Hosp, I have been leading a multidisciplinary group including Molecular Biology, Epidemiology and Molecular Epidemiology and Clinical Sciences. I have successfully conducted many studies requiring the coordination of a complex international team including Hospital and Academic Institutions. The outcome of these activities have allowed for new front line therapies for MPM as detailed in the Section C below More in general terms I have studied the immune response to MM as it follows: I have published the first paper suggesting that Mesothelioma cells have the potential to elicit a T-cell mediated immune response, however the same tumor cells induce immune-suppression via TGF and AKT activation although do express Cancer Testis Antigens (CTA).I have also provided with the rationale of using anti-CTLA4 for MPM and tested their efficacy
for MPM in the first trial ever conducted worldwide.

Contributions to Science
All of my translational research activity is aimed at leading as a PI and managing multidisciplinary groups to translate of our pre-clinical findings on thoracic tumors into clinical practice and clinical trials. The current front line therapy for Mesothelioma including antiangiogenic is the direct outcome of our preclinical and translational studies. I pioneered research on Mesothelioma back in early 90s, and started, together with Marie Claude Jaurand, Bruce Robinson and a few others, the IMIG in Paris in 1993. I have dedicated the career to the care of patients with mesothelioma to develop new treatments based on solid preclinical research.

Contribution to Mesothelioma and Lung Cancer:
Use of Antiangiogenic for MPM
Role of actionable TKI and PI3K/AKT signaling in MPM
Immune Check Inhibitor (ICI) and PARPi as novel therapeutic tools against MPM and Lung Cancer
European Guidelines for Mesothelioma, and Lung Cancer
Viral Carcinogenesis and MPM

Here below the link to my publications on Mesothelioma so far as per those listed on pubmed.gov:
https://pubmed.ncbi.nlm.nih.gov/?term=Mutti+L.+Mesothelioma&sort=date

INSTRUMENTED DUAL TASK TIMED UP AND GO IN PATIENTS WITH PARKINSON'S DISEASE

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ABSTRACT

A. Palomba; S. Liguori; M. Paoletta; A. Moretti; G. Iolascon, F. Gimigliano

Introduction
Patients with Parkinson's disease (PD) often show gait impairments, particularly during complex tasks [1]. The Timed Up and Go test (TUG) is a validated mobility assessment tool in patients with PD [2]. The simultaneous use of a cognitive task while performing the TUG (Dual Task TUG: DT-TUG) helps identifying the risk of falling in this population [3]. The aim of the present work is to verify whether the request of a cognitive task influences performance in the execution of the TUG and which moments of the motor task appear significantly altered in the DT-TUG.

Materials and methods
Patients diagnosed with PD were asked to perform a TUG test and a DT-TUG test. The motor and cognitive tasks were explained verbally and then shown by an experimenter and the patients were allowed to try it in order to become familiar with the test and to be certain of complete understanding of the task. Once the test began, patients were allowed a maximum of two attempts on the TUG and DT-TUG. Patients were asked to wear an inertial sensor (G-Sensor, BTS) positioned by the experimenter through a belt in the lumbar region, allowing to collect the duration of TUG phases: sit-to-stand, walk-out, turn-around, walk-in, and stand-to-sit. A statistical analysis using Student's t-test for paired samples was applied to collected data.

Results
Twenty-six patients diagnosed with PD (8 F, 18 M; average age: 64.4 years; average duration of disease: 4.5 years) were assessed. All patients were able to complete the test. The duration of the DT-TUG (mean ± DS: 15.57 ± 4.58 s) was significantly longer (p value: 0.001) than the one of the TUG (13.30±3.12). In particular, the duration in the phases of sit-to-stand and stand-to-sit were not significantly different, whereas the differences in the durations of the turn-around (intermediate, p-value: 0.020 and final, p-value: 0.040) and in the walk-in phases (p-value: 0.004) were statistically significant.

Conclusions
When patients with PD are asked to perform a cognitive task during a complex motor task, their overall performance worsens; in particular, the dynamic phases of walking and changes of direction (with 180° rotations) are affected, augmenting the risk of falling in such patients and possibly representing a target for rehabilitation

treatment from a preventive perspective. This might have implications on activities of daily living in which patients often face complex motor-cognitive demands. Future developments will, therefore, include the implementation of a specific rehabilitation protocol and the assessment of its results.

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Vance, R. C., Healy, D. G., Galvin, R., & French, H. P. (2015). Dual tasking with the timed “up & go” test improves detection of risk of falls in people with Parkinson disease. Physical therapy, 95(1), 95-102.

BIOGRAPHIES

- Angela Palomba:
  - MD, PhDs, PRM physician,
  - Vice-chair of ISPRM Task Force on Physical Activity for Persons with Disabilities
  - Cochrane Rehabilitation Ebook Project Manager
  - Vice-president and Medical Officer in SUDS Executive Board

- Francesca Gimigliano:
  - MD, PhD, PRM physician,
  - President of the International Society of Physical and Rehabilitation Medicine,
  - Cochrane Rehabilitation member
  - Professor of Physical and Rehabilitation Medicine
  - Coordinator of the National Ph.D. Program in Public Administration and Innovation for Disability and Social Inclusion
  - President of the School of Speech and Language Therapy
  - Chair of the Residency Program in Physical and Rehabilitation Medicine

Affiliation: Department of Mental and Physical Health and Preventive Medicine, University of Campania “Luigi Vanvitelli”

A SMALL PHARMACOLOGICAL CHAPERONE IMPROVES COGNITIVE FUNCTION AND SYNAPTIC PLASTICITY IN A MOUSE MODEL OF DOWN SYNDROME

Domenico Pratico
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ABSTRACT

Mary Elizabeth Curtis[1], Tiffany Smith[1], Miroslav Nenov[1], Benjamin E. Blass[2], and Domenico Praticò[1]

[1]Alzheimer's Center at Temple, Lewis Katz School of Medicine; [2]School of Pharmacy, Temple University, Philadelphia, PA, 19140.

BACKGROUND: Retromer complex system proteins are decreased in post-mortem brain tissues from Down syndrome subjects and inversely correlate with the Alzheimer's disease-like neuropathology. However, whether targeting in vivo the retromer system affects cognitive deficits and synaptic function in Down syndrome remains unknown.

OBJECTIVE: The aim of the current study was to examine the effects of pharmacological retromer stabilization on cognitive and synaptic functions in a mouse model of Down syndrome.

METHODS: Ts65dn mice were administered the pharmacological chaperone, TPT-172, or vehicle from 4 to 9 months of age and then assessed for changes in cognitive function. To assess the effects of TPT-172 on synaptic plasticity, hippocampal slices from Ts65dn mice were incubated in TPT-172 and used for field potential recordings.

RESULTS: Chronic TPT-172 treatment improved performance in cognitive function tests, its incubation with hippocampal slices ameliorated synaptic function responses.

CONCLUSIONS: Pharmacological stabilization of the retromer complex system improves synaptic plasticity and memory in a mouse model of Down syndrome. These results support the therapeutic potential of pharmacological retromer stabilization with small chaperone type of drugs for individual with Down syndrome.

Maria Carmen Ragosta

Ph.D.

ABSTRACT

The DNA damage response could be defined as a double face of tumour: cause and treatment. Some DDR proteins are involved in the cancer-prone syndrome as in the *ataxia telangiectasia (ATM) or Nijmegen Breakage syndrome (Nibrin)* correlating them as tumour developing factors. Conversely, the DNA repair defects are used as "Achille's heel" of cancer, favouring the treatment with the DNA damage agents through radiation therapy or cisplatin generating various kinds of DNA lesions (single or double strand breaks) although side effects showed onto healthy tissues limits the use of this cancer therapy. In this scenario, the identification of novel therapeutic strategies based onto the personal genetic makeup could be essential to improve the cancer treatments. The discovering of high selective actions of PARP-inhibitors for BRCA1-/- breast cancer cells, opened a "synthetic lethal era". DNA double-strand breaks (DSBs) contribute to genome instability, a key feature of cancer. DSBs are mainly repaired by homologous recombination (HR) and non-homologous end-joining (NHEJ). The HR could be divided into the DNA end-resection, strand invasion and resolution of the repair intermediates. All these steps are finely regulated by the presences of many proteins, some of which mutated in tumours samples and implicated in cancer development. The high selective action of PARP inhibitors onto BRCA-/- cells, respect to the normal tissue, increased the scientific interest in the HR mechanism characterization. We investigated the role of an isoform of the multifunctional cyclin-dependent kinase 9, CDK9-55, in DNA repair, by generating CDK9-55-knockout HeLa clones (through CRISPR-Cas9), which showed potential HR dysfunction. A phosphoproteomic screening in these clones treated with camptothecin revealed that CDC23 (cell division cycle 23), a component of the E3-ubiquitin ligase APC/C (anaphase-promoting complex/cyclosome), is a new substrate of CDK9-55, with S588 being its putative phosphorylation site. Mutated non-phosphorylatable CDC23(S588A) affected the repair pathway choice by impairing HR and favouring error-prone NHEJ. This CDK9 role should be considered when designing CDK-inhibitor-based cancer therapies.

BIOGRAPHY

Maria Carmen Ragosta, is an Italian PhD student from the University of Siena, Italy. She has started her doctoral studies in Medical Biotechnologies, after completing her Master of Science degree in Molecular Biology at the University of Naples, Italy, in 2021. She has been working at Mercogliano Oncology Research Center (CROM) since 2021, followed by Dr. Luigi Alfano, PhD author of this paper. Maria Carmen came to the United States as an exchange visitor/student on September 2022, at the Sbarro Health Research Organization (SHRO), Temple University Philadelphia, Pennsylvania.

SINGLE-CELL TECHNOLOGIES FOR BIOMEDICAL RESEARCH

Alberto Riva
Ph.D., Scientific Director
Bioinformatics Core, Interdisciplinary Center for Biotechnology Research
University of Florida

ABSTRACT

Next-generation sequencing technologies have revolutionized biomedical research, giving us the unprecedented ability to measure the expression level of a large number of genes in an unbiased, quantitative way. We can therefore study how gene expression patterns change in response to treatments, disease progression, or external stimuli, comparing samples representing different experimental conditions to each other, or tracking changes over time. The main limitation of this approach is that it requires a large number of cells for each sample; therefore, it can only measure the average gene expression in a population of cells that can be very diverse, and it lacks the ability to identify subpopulations of cells with different expression patterns.

Single-cell RNA sequencing (scRNA-seq) is a powerful technology that allows researchers to analyze the gene expression profiles of individual cells, providing insights into cellular heterogeneity and complex biological processes. By studying the gene expression patterns of single cells, researchers can identify rare cell types and subpopulations, as well as discover novel cell states and pathways. For example, scRNA-seq has been used to identify rare cancer stem cells that drive tumor growth and resistance to therapy, and has helped to identify novel immune cell subtypes, which can aid in the development of immunotherapies for cancer and autoimmune diseases. Another important application of scRNA-seq is its ability to uncover the molecular mechanisms underlying complex biological processes such as development and differentiation. By analyzing the gene expression patterns of individual cells at different stages of development, researchers can identify the genes and signaling pathways involved in cell fate decisions.

Overall, single-cell technologies are transforming our understanding of cellular heterogeneity and complex biological processes, paving the way for new discoveries and therapeutic interventions. As this technology continues to evolve and become more widely adopted, it has the potential to unlock new insights into the molecular basis of disease and to accelerate the development of personalized medicine.

In my presentation I will highlight the basic principles of scRNA-seq analysis, and I will describe how its results can be interpreted through the identification of different cell types and cellular states, leading to new scientific knowledge.

BIOGRAPHY

Alberto Riva, PhD, is the Director of the Bioinformatics Core at the University of Florida Interdisciplinary Center for Biotechnology Research. He is an expert in the application of high-performance computing for the automated analysis of large-scale genomic datasets.

CUTANEOUS ANGIOSARCOMAS: MOLECULAR LANDSCAPE BEYOND MYC DEREGULATION

Andrea Ronchi
MD, Ph.D, Pathology Unit, Department of Mental and Physical Health and Preventive Medicine, Università degli Studi della Campania "L. Vanvitelli", Naples, Italy.

ABSTRACT

Background: Malignant Cutaneous angiosarcomas (cASs) are aggressive neoplasms, with high metastatic rate and high mortality. Two subtypes of cASs are defined, with different clinical and molecular features: primary cAS and secondary cAS. The molecular landscape of cASs is still poorly known.

Methods: Twenty-nine formalin-fixed and paraffin-embedded tissue samples of cASs were collected by 4 Italian centers (University of Campania "Luigi Vanvitelli", University of Sassari, University of Catania, Oncological National Institute "Pascale"). Molecular analysis was performed by using TruSight™ Oncology 500 (TSO500) targeted hybrid-capture based NGS assay. Fluorescence in-situ hybridization (FISH) was performed to detect MYC amplifications and translocations. Immunohistochemistry (IHC) was performed to indagate the expression of c-myc and FGFR4 proteins.

Results: c-Myc IHC was tested in all 29 cases. Eleven out of 29 (37.9%) cases resulted positive, and the remaining 18 (62.1%) cases resulted negative. The 11 positive cases included 6 (54.5%) primary cASs and 5 (45.5%) secondary cASs. FISH was tested in 25 cases; MYC amplification was present in 5 (17.2%) cases, including 3 (60%) primary cASs and 2 (40%) secondary cASs. MYC rearrangement was observed in 1 (3.4%) case, corresponding to a secondary cAS. MYC amplification and/or rearrangement significantly correlated with secondary cAS ($p<.05$). FGFR4 G388R, RUNX1 L56S and MUTYH G393D mutations resulted in 46.8%, 50% and 33.6% of cases, respectively. All cASs showed FGFR4 expression by IHC, but expression intensity was lower in FGFR4-mutated cases ($p<.05$).

Conclusions: c-myc was overexpressed in 37.9% of cases, including both primary and secondary cASs. MYC amplifications and rearrangements by FISH were less frequent, demonstrating that other different molecular mechanisms may lead MYC deregulation. MYC amplification and/or rearrangement significantly correlated with secondary cAS ($p<.05$). NGS analysis revealed some recurrent mutations with potential clinical significance in cASs, including FGFR4 G388R in 46.8% of cases. The report of FGFR G388R in cASs could be important, as Pan-FGFR inhibitors are being evaluated in patients with solid tumors harboring FGFR alterations. FGFR4 G388R enhances STAT3 signaling and correlates with higher MAPK pathway activation. FGFR4 mutation may lead to decreased protein expression.

BIOGRAPHY

Andrea Ronchi MD PhD is researcher and pathologist at University “Luigi Vanvitelli” in Naples, Italy. Dr Ronchi holds an MD and a PhD in medical, clinical and experimental sciences from University “Luigi Vanvitelli” in Naples (Italy). His primary research interests are in the investigation of molecular landscape of cutaneous neoplasms, and in the definition of novel diagnostic approach for cutaneous neoplasms.

EFFECT OF TRANSGLUTAMINASE-CROSSLINKED COATING TO REDUCE THE FAT-UPTAKE OF FRIED SAUSAGES

Giovanna Rossi-Márquez
Ph.D., Biotechnological Sciences
Tecnológico Nacional de México/Instituto Tecnológico José Mario Molina Campus Lagos de Moreno

ABSTRACT

Edible coatings are a natural alternative to protect foods by creating a barrier on the food surface, it can be prepared using proteins, carbohydrates and/or lipids, and are applied directly on the food surface. In fried products, edible coatings demonstrated their ability to reduce the fat uptake during the frying process Moreover, the presence of transglutaminase (TGase) has demonstrated their ability to enhance the properties of edible coatings. Usually, the most common street food are fried products, in Mexico fried hot dog sausages are known as “salchipulpos”. In this project, a protein/carbohydrate solution was prepared using whey protein isolate and pectin from *Citrus* at a 4:1 relation (protein/carbohydrate), TGase was added to the solution and let stir for 8h. Edible coating was applied on the hot dog sausages prior frying and let drained for 10 min. After the frying process, the water loss and fat uptake was measured according to the AOAC standard methods (950.46 and 960.39 respectively). Results shown that the presence of the coating decrease the water loss during frying and create a barrier that protect the sausages, reducing significatively the fat uptake by the product. Furthermore, the presence of TGase reduce even more the fat-uptake of the sausages, improving the coating performance. These results demonstrated the ability of edible coatings to reduce oil content in fried food and thus consume a reduced-fat product.

BIOGRAPHY

- Graduate Degree in Chemical-Biological analysis at the University Autonomy of Aguascalientes, Mexico; Master in Food Science and Technology at the University Autonoma of Queretaro, Mexico and PhD in Biotechnological Sciences at the University of Naples Federico II, Italy.
- 12 publications in peer-reviewed journals.
- Research stages at the University of Manitoba (Canada), Institute of Food Research (England), Centro de Investigaciones en Óptica (México), Universitá degli Studi di Napoli Federico II (Italy).
- Thesis direction and co-direction of graduate and postgraduate students.
- Guest Editor in Edible Films and Coatings: Fundamentals and Applications Edition I and II, Coatings, Multidisciplinary Digital Publishing Institute (MDPI).

LONG-TERM CORRELATION BETWEEN CARDIORESPIRATORY FITNESS, SPIROMETRIC PARAMETERS AND RADIOLOGY IN PATIENTS HOSPITALIZED FOR COVID-19 : THE STUDY «CAPTAIN COVID»

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[4]SSD Pneumologia , AO Santa Maria , Terni (Italy)
[5]SoLongevity, Milano (Italy)

ABSTRACT

Background: Interstitial pneumonia caused by SARS-CoV-2 is one of the main manifestations of COVID-19 infection and may require hospitalization and can lead to a compromise of functional capacity even months after hospital discharge.

Aim: The aim of this study is to analyze how the cardiopulmonary exercise testing (CPET) can be used to evaluate the fitness status of the patient, correlating such alterations with the results of radiological and other functional exams.

Materials and methods: The study involves a 3-month follow-up visit to patients previously hospitalized with a severe interstitial pneumonia. The evaluation includes an objective assessment, vital signs monitoring, blood sampling, high-resolution computed tomography (HRTC), echocardiography, spirometry and CPET.

Results: Out of a population of 67 patients, 19% (77% men, BMI = 31.2 kg/m2) had fibrotic alterations in the HRTC at the 3-month follow-up. These lesions appeared to be correlated with higher mean systolic blood pressure (144±15 mmhg) and older age (61 ± 8). Furthermore, 85% of these patients underwent mechanical ventilation during the acute phase of the infection and 31% of them stayed in ICU for a period of 16 ± 6 days. These patients had inferior values of VO2 (18 ± 6= 76% ± 17% of predicted) and of VO2/WR (8.47 ± 2).

Conclusions: Two types of damage were identified: chronic lung damage and physical deconditioning damage, both of which are correlated with the severity of the disease and the need for mechanical ventilation and the duration of the average length of stay. Chronic lung damage seems to be related to the severity of acute illness as evidenced by the HRTC findings. These alterations also reflect a limitation of the subject's functional capacity, which is manifested by dyspnea and reduced peak VO2 and VO2/WR values on CPET. It is important to perform long-term follow-up to understand if these alterations persist or change over time, in relation to perceived symptoms, too.

BIOGRAPHY

- Medico Chirurgo Specialista in Medicina dello Sport
- Già Dirigente Medico Disciplina di Cardiologia USL Umbria 1 con incarico aziendale di Cardiologia dello Sport (2012-2023)
- Consulente Cardiologo Società Sportiva Calcio Napoli dal 2009
- Stadium medical Official SSC Napoli Competizioni UEFA (Champions League 2022-2023)
- Autore di numerose pubblicazioni su riviste nazionali ed internazionali di Medicina e di Cardiologia dello Sport
- Responsabile scientifico di diversi congressi di carattere nazionale di Cardiologia e Medicina dello Sport
- Partecipazioni a numerosi congressi di carattere nazionale ed internazionale di Cardiologia e Medicina dello Sport in qualità di relatore e moderatore
- Esperienze lavorative come Medico dello Sport con diverse federazioni (FIGC settore giovanile SSC Napoli); FIP, FIDAL; consulente cardiologo per la Società MED-EX presso la sede Ferrari di Maranello nel 2013
- Master in Ecocardiografia di livello base e di livello avanzato
- Master nel Test da sforzo Cardiopolmonare conseguito presso il Centro Cardiologico Monzino
- Socio SIC Sport ed ANCE
- Buona conoscenza di lingua inglese e spagnola

Caterina Tomassetti
BS in Biological Science, MD in Health Biology
Biomedical Technologies and Experimental Oncology Laboratory, University of Siena, Italy

ABSTRACT

Lung adenocarcinoma is one of the most frequent and deadly cancers worldwide and in recent years much attention is being paid to TME as an attractive target for anti-cancer therapy. For this purpose, the differential expression of 730 immune-related genes has been analyzed in this work. This analysis has been conducted on RNA samples extracted from both tumoral and non-tumoral specimens, previously disrupted by the employment of a new medical device called Rigeneracons® (RIGENERA-HBW), to test its efficacy in terms of RNA quality.
To address this, 96 fresh human lung tissues, half tumoral and half non-tumoral, were collected from 48 patients. Each sample was split into two and processed both with (w R) and without Rigeneracons (w/o R), to obtain a lysate from which RNA was extracted. RNA integrity was verified primarily with 2% agarose gel electrophoresis, then by Quantitative Reverse Transcription PCR (qRT-PCR). Afterward, from the total number of samples processed w R, both tumoral and non-tumoral, only the samples from LUAD patients were selected for the transcriptomic analysis. In this way, it has been possible to assess the differential expression of a panel of 730 genes involved in the TME by using Nanostring Technologies.
The results indicated that the concentration of extracted RNA does not show substantial differences between samples processed w R and w/o R. On the contrary, from the electrophoresis and the qRT-PCR emerged that the samples processed w R appear less degraded than those processed w/o R.
Then, gene expression data analysis provided a clustering analysis showing that the two groups of samples (tumoral and non-tumoral) cluster in two well-defined groups, based on differential gene expression. Lastly, the resulting up-regulated genes in tumoral samples have been included in the Reactome database for the pathways enrichment, bringing to light several up-regulated pathways. Among them, the IL-21 Signaling pathway drew our attention due to the lack of information about its role in LUAD. A deeper analysis may be desirable to highlight new insides in the knowledge about the TME and discover new and targetable biomarkers for more precise therapies.

BIOGRAPHY

Caterina Tomassetti has a Bachelor's degree in Biological Science and a Master's degree with honors in Health Biology. For the last year, she worked at the Biomedical Technologies and Experimental Oncology laboratory directed by Prof. Antonio Giordano at the University of Siena (Italy), doing her curricular internship, focusing on research about lung adenocarcinoma and its tumor microenvironment (TME).

EPIGENETIC AND TRANSCRIPTIONAL DYSREGULATIONS PROMOTING ACUTE LEUKEMIAS DEVELOPMENT

Luca Tottone

Ph.D., Assistant Scientist @ Nimer Lab UM - Sylvester Comprehensive Cancer Center – University of Miami

BIOGRAPHY

Since my early studies in medical biotechnology, I was captivated by the relationship between aberrant gene regulation and the pathogenesis of Acute Leukemias, aggressive forms of lymphoid and myeloid cancers characterized by poor outcome due to resistance to therapies and tumor relapse.

In December 2016 I graduated with honors in the Molecular Medicine Ph.D. program of La Sapienza Molecular Medicine Department (Rome, Italy), under the guidance of Prof. Isabella Screpanti. Here I dissected the role of two epigenetic factors, JMJD3 and P300, in regulating a NOTCH-responsive *NOTCH3* intragenic enhancing region responsible for the overexpression of this oncogene in a particular subset of T-ALL patients (1). Moreover, a successful collaboration with the Italian Institute of Technology (IIT) and La Sapienza Chemistry Department led to the identification and patenting of a novel chalcone derivative, the compound 8 (C8), showing potent anti-leukemic activity in a NOTCH-specific fashion (2)(3).

In March 2018, I joined Dr. Daniel Herranz lab at Rutgers Cancer Institute of New Jersey (CINJ) (New Brunswick, NJ, USA) as a postdoctoral fellow. Here, by mastering the state-of-the-art techniques in genome analysis, I identified a tumor suppressor enhancer of PTEN in T-ALL (PE). PE is a super-enhancer located ~550Kb downstream to the gene TSS that shows high levels of interaction with *PTEN* promoter and plays a major role in T-cell development and transformation. We found that recurrent deletions encompassing PE in a panel of human T-ALLs correlate with lower levels of *PTEN* expression, further supporting the relevance of PE in leukemia (4).

In May 2022 I decided to expand my knowledge in the field of hematopoietic malignancies by joining Dr. Stephen Nimer's seminal studies on Acute Myeloid Leukemia (AML) and Myelodysplastic syndromes (MDS). As an Assistant Scientist at the Sylvester Comprehensive Cancer Center (Miami, FL, USA), I aim to investigate the mechanisms promoting CARM1 overexpression in Acute Leukemias.

Overall, relying on my solid experience in drug discovery, cancer epigenetics and *in vivo* modelling, I am contributing to shed light in the aberrations promoting Acute Leukemias onset and resistance to therapies, with the aim to determine the therapeutical effects of targeting epigenetic factors in Acute Leukemias, alone or in combination with approved treatments.

1) **Tottone L***, Zhdanovskaya N*, et al. (2019) Front Oncol, 9: 198.
(*) Equal Contribution (PMID: 31001470) (PMCID: PMC6456714)
2) Mori M*, **Tottone L***, Quaglio D*, et al. (2017) Sci Rep, 7:2213.
(*) Equal Contribution (PMID: 28526832) (PMCID: PMC5438367)
3) **Tottone L**, et al. (2019) Patent Deposit IT201600132360A1/US20190337916A1
4) **Tottone L**, et al. (2021). Blood Cancer Discov, 2:1-2.
(PMID: 33458694) (PMCID: PMC7810363)

PROGRANULIN MODULATES RYK AND EGFR ACTIVITY IN MESOTHELIOMA CELLS

Elisa Ventura
Research Assistant Professor at the Department of Biology, College of Science and Technology, Temple University, Philadelphia

ABSTRACT

Elisa Ventura[1], Antonio Giordano[1,2], Andrea Morrione[1]
[1]Sbarro Institute for Cancer Research and Molecular Medicine, Center for Biotechnology, Department of Biology, College of Science and Technology, Temple University, Philadelphia, PA 19122, USA
[2]Department of Medical Biotechnologies, University of Siena, I-53100 Siena, Italy

Mesothelioma is an aggressive disease with poor prognosis and limited therapeutic options. A better understating of mesothelioma biology might lead to the identification of novel therapeutic targets.
Progranulin is a pleiotropic growth factor often dysregulated in cancer. In many tumor entities progranulin has a pro-tumorigenic role, however the molecular mechanisms of progranulin oncogenic action are not fully elucidated. In bladder cancer, progranulin promotes tumor cell migration, invasion, and *in vivo* tumor growth by triggering EphA2 non-canonical signaling. Recently, we have demonstrated a critical role for progranulin in mesothelioma, where it modulates cell migration, invasion, adhesion, and *in vivo* tumor formation. Interestingly, EphA2 is not the major functional receptor of progranulin in mesothelioma, where it activates multiple RTKs, including EGFR and RYK, the last one being a co-receptor of the WNT pathway apparently not having a kinase activity. In addition, we have demonstrated that progranulin interferes with focal adhesion turnover, a key process in cell migration and invasion, by modulating the phosphorylation of FAK in a RYK-dependent manner. Thus, our data suggest that progranulin modulates a complex crosstalk between EGFR, RYK and FAK, however we do not know the molecular mechanisms. Using immunofluorescence techniques, we observed that progranulin co-localizes with RYK. This observation is in accordance with the results of co-immunoprecipitation experiments suggesting that progranulin and RYK exist in a protein complex in mesothelioma cells. Interestingly, progranulin and RYK co-localization seems to occur mainly in intracellular vesicles, suggesting a potential role for progranulin in regulating RYK internalization/re-cycling. This hypothesis is also sustained by our preliminary data on RYK stability, as in fact we observed that the levels of RYK in cycloheximide-treated *GRN* KO MSTO-211H cells were reduced in recombinant progranulin-treated *versus* untreated cells. Interestingly, in immune-fluorescence experiments, we also observed RYK/EGFR and RYK/FAK co-localization. In agreement, co-immunoprecipitation experiments indicated the presence of protein complexes containing RYK and EGFR and RYK and FAK in mesothelioma cells. All together these data suggest that progranulin oncogenic mechanisms of action might include progranulin-dependent modulation of RTKs internalization/recycling and/or formation of protein complexes containing multiple RTKs.

BIOGRAPHY

Elisa Ventura

Elisa Ventura is Research Assistant Professor at the Department of Biology, College of Science and Technology, Temple University, Philadelphia, PA, USA. She obtained her M.Sc. degree in Cellular and Molecular Biology in 2007 and specialized in Clinical Pathology in 2014 at the University of Genoa, Genoa, Italy. She obtained her PhD in Cancer Biology in 2017 at the University of Zurich, Zurich, Switzerland. Her research interest focuses on cell signaling pathways whose dysregulation is associated with tumor initiation and progression.

UNDERSTANDING THE MOLECULAR BASES OF THE ANTI-HIV ACTIVITY OF SAMHD1, INDEPENDENT OF ITS DNTPASE FUNCTION

Alessia Zamborlini
Professor in Virology at Paris Saclay Univeristy, Paris, France

Alexa Tambon[1], Arthur Cormier[2], Mathieu Pinaud[1], Viviana Scoca[3], Nicole E. Bowen[4], Maria El Chababi[1], Noé Palmic[2], Francesca Di Nunzio[3], Baek Kim[4], Roger Legrand[1], Alessia Zamborlini[1]

[1]CEA, Université Paris Saclay, INSERM U1184, Center for Immunology of Viral Infections and Autoimmune Diseases, IDMIT Department, IBFJ, Fontenay-aux-Roses, France.
[2]INSERM U944, CNRS UMR 7212, Genomes & Cell Biology of Disease Unit, Institut de Recherche Saint-Louis, Université de Paris, Hôpital Saint-Louis, Paris, France.
[3]Advanced Molecular Virology and Retroviral Dynamics Group, Department of Virology, Pasteur Institute, 75015 Paris, France.
[4]Emory School of Medicine, Atlanta, USA.

ABSTRACT

SAMHD1 is a multifunctional protein that regulates the innate immune response in many ways, including by inhibiting HIV-1 replication in macrophages and other non-cycling immune cells. This antiviral function is largely attributed to its nucleoside triphosphohydrolase (dNTPase) activity which lowers the dNTP levels below a threshold required for efficient reverse transcription, thus limiting the accumulation of immunostimulatory nucleic acids. Although the antiviral activity is limited to non-cycling immune cells, SAMHD1 expression is largely cell cycle-independent, pointing to the existence of a post-translational regulation. It is currently well established that phosphorylation of residue T592, mediated either by cellular or viral kinases, renders SAMHD1 antivirally inactive. We recently found that SUMOylation of residue K595 stimulates the restriction phenotype (Martinat, Nat Comm 2021). Noteworthy, neither phosphorylation nor SUMOylation affects the dNTPase activity, implying that additional SAMHD1-mediated mechanisms contribute to the establishment of an antiviral state. Numerous studies support an interaction between SAMHD1 and nucleic acids, including the HIV-1 RNA genome in macrophages. Reports that SAMHD1 harbors a nuclease activity that degrades the incoming viral RNA genome (gRNA) remain controversial.

By analyzing the restriction phenotype of a wide range of SAMHD1 variants, we collected strong evidence demonstrating that inhibition of reverse transcription is achieved in two ways: by limiting the supply of dNTPs by virtue of SAMHD1 dNTPase activity and through a yet undefined dNTPase-independent mechanism that i) operates in a dNTP poor environment and ii) is relieved upon T592 phosphorylation or loss of K595 SUMOylation. We also bring evidence that the viral RNA genome persists for many hours in settings where reverse transcription is pharmacologically suppressed. Removing the inhibitor allows the viral cycle to resume in cells expressing a restriction-defective SAMHD1 mutant. Viral gene expression can be also witnessed in the presence of restriction-competent variants, provided that exogenous dN are supplemented or SAMHD1 T592 phosphorylation stimulated. These observations argue that SAMHD1 does not degrade the incoming RNAg. We currently test the hypothesis that, by binding to the RNAg, SAMHD1 might generate a steric hindrance impairing DNA synthesis by the reverse transcriptase (RT). Phosphorylation might alleviate this block promoting SAMHD1 dissociation from the RT-vRNA complex. Alternatively, it might stimulate RT polymerization, reminiscent of its activity at replication forks.

BIOGRAPHY

Alessia Zamborlini, Professor in Virology
INSERM U1184, CEA/ Paris Saclay University (France)

I am Professor in Virology at Paris Saclay University since 2019. My research activity focuses on the interactions established between the host cell and the virus upon infection. My favorite cellular and viral models are macrophages and the Human Immunodeficiency Virus (HIV), respectively.

During my PhD training I worked in the Lab of H. Gottlinger at Dana-Farber Cancer Institute (Harvard Madical School) where I investigated how HIV hijacks the ESCRT complexes to exit the producer cells. After obtaining my PhD degree at the University of Padova, I joined the lab of A. Saïb in Paris as a Post doctoral researcher to study the regulation of HIV replication by the cellular SUMOylation process as well as the establishment of viral latency in quiescent cells. In 2009 I then obtained a position as lecturer in Biology at Cnam in Paris. I progressively developed an interest for understanding how the antiviral activity of cellular factors connects with their contribution to innate response control and the maintenance of genome stability.

STEAM

MODERATOR

Rosanna Bonasia
Professor in Civil Engineering and Sustainable Technologies at the Tecnológico de Monterrey, Campus State of Mexico, Mexico.

Master's degree in Geological Sciences and PhD in Earth Sciences from the Università degli Studi di Bari.

Post-doctorate on tephra fallout hazard assessment at Vesuvio and Campi Flegrei, at the National Institute of Geophysics and Volcanology in Naples, Italy.

Post-doctorate on tephra fallout hazard assessment for explosive Mexican volcanoes, at the Geosciences Center of the UNAM, Querétaro, Mexico.

Volcanologist by training, specialized in Computational Fluid Dynamics and risk analysis related to natural and engineering phenomena, through the application of numerical models and statistical analysis.

The main research lines currently developed are:

- Analysis and evaluation of flood risk in Mexico through the study of hydrodynamic properties in channels and dams by the application of Eulerian and Lagrangian numerical models (SPH);
- Numerical study of wave transport and calculation of energy potential on the coasts of Mexico;
- Numerical simulations using the SPH model of the tsunami impact on the coasts;
- Long-range hazard assessment of dispersion and deposit of volcanic ash, through numerical models.

DISTINCTIONS

President of the Association of Italian Researchers in Mexico (ARIM). March 2023.
Mexican National System of Researchers Level 2.
Award for Educational Excellence Cusco 2020 Edition.
Doctor Honoris Causa and Golden Order of Teaching awarded by the International Organization for Inclusion and Educational Quality (OIICE).
President of the Fluid Dynamics Division of the Mexican Physics Society. 2019 - 2021.

SCIENTIFIC PRODUCTION

More than 20 scientific articles in JCR journals and three book chapters.
Editor of Frontiers in Earth Sciences journal special issue: “Flood Susceptibility and Risk

Maps as a Crucial Tool to Face the Hydrological Extremes in Developing Countries: Technical and Governance Aspects Linked by a Participatory Approach”.

MODERATOR

Andrea Morrione
Ph.D., Sbarro Health Research Organization/Temple University Philadelphia

After his studies in Biochemistry at Universita' degli Studi di Milano, Milan Italy, Dr. Morrione moved to USA in 1993 and has been working in the field of cancer biology since his postdoctoral training at the Kimmel Cancer Institute, Thomas Jefferson University, Philadelphia, PA in the laboratory of Dr. Renato Baserga, one of the leading experts in IGF-IR oncogenic signaling. In 1997 Dr. Morrione joined the Faculty of Thomas Jefferson University in the Department of Microbiology. In 2002 after receiving an NIH/NIDDK Career Development Award Dr. Morrione joined the Department of Urology at Jefferson where from 2008 to 2018 serves as the Director for Urology Basic Science and Associate Professor. Dr. Morrione has now joined the Sbarro Institute for Cancer Research and Molecular Medicine and Center for Biotechnology, where he is currently Associate Professor (Research) and Director of the Molecular Mechanisms of Cancer Signal Transduction Program.

Dr. Morrione has made several important discoveries in determining the role of growth factor receptors in transformation. He is the author of 83 peer-reviewed publications and book chapters and serves as a member of numerous editorial boards of high impact factor journals, including Matrix Biology, *Cancers* and Frontiers in Endocrinology (Cancer Endocrinology).

In recent years Dr. Morrione built an NIH funded program in the investigation of growth factor signaling (progranulin) in bladder cancer. As expert in cancer cell signaling, he has served on several organizing committees, chaired sessions and presented his work at numerous international meetings. Dr. Morrione has acted as expert reviewer on Study Sections for NIH, the American Urological Association (AUA) and BCAN (Bladder Cancer Advocacy Network) and serves as expert reviewer for numerous funding agencies including The Research Grants Council (RGC) of Hong Kong, AIRC (Associazione Italiana Ricerca sul Cancro), Breast Cancer Campaign, UK, Genome British Columbia and Diabetes, UK.

HOW CAN I CREATE A DIFFERENT PRODUCT IN A CROWDED MARKET LIKE WINE?

Marco Baldocchi
CEO & Neuromarketing expert- Miami National Association of Neuroscience

ABSTRACT

Few months ago, a wine producer approached us with the aim to give new names to their products and develop new labels. Ca'Stelle, the company, has three product lines based on their target consumers: wine experts, wine lovers and young people who love to make wine-based aperitifs. There 11 wines in total. Speaking to the company's CEO, during our first meeting, he said: "Our products are different, they have a soul".
This was the trigger that made us think about this research; **can a sensorial product like wine be universally recognized and associated with a particular type of human being?** The aim of the research was to have candidates taste the wine for each product line and then to submit them to a test that would figure out if they are able to associate the product to a person by indicating physicality, character traits and behavioral characteristics.

Approach
After selecting 20 candidates for each product line that reflected the characteristics of the individual targets we subjected them to a blind tasting, that was, for each wine tasted, they knew neither origin, nor grape variety, nor color (the glass was darkened). After each tasting, the testers were subjected to an **implicit reaction time test** that measured responses to understand their perceptions framed around the question: **If this wine were a person, what kind of person would it be would it be?**
During the test the candidates had a camera that recorded their face in order to subsequently allow the **analysis of emotions during the test through a micro facial expression recognition software.** In addition, **the testers wore a galvanic skin response kit to measure changes in skin conductance, with the aim of analyzing any stress experienced during the test.**
The underlying purpose was to understand if different people were able associate to the same wine identical characteristics related to a person, or if the perception of a wine was disconnected from the perception of a human being.

BIOGRAPHY

Marco Baldocchi is the founder of the Marco Baldocchi Group Inc., neuromarketing agency based in Miami.
He is a speaker at international events on neuromarketing and a former for institutions such as 24Ore Business School, Università Cattolica del Sacro Cuore, and Edulia by Treccani.
He is the author of "Neurofood" (Hoepli 2022) and "Neuromarketing for food" (Flaccovio-Editore 2020), and a co-author “Neurocopywriting” (Hoepli 2022) and Ethical Neuromarketing (Hoepli 2023).
He is a member of the Neuromarketing Science & Business Association and was voted by its members as the "6th Top World Speaker - Neuromarketing Series 2021".
He serves as the Neuromarketing Research Director for the National Association of Applied Neuroscience

SOURCES OF DECOHERENCE IN TRANSMON SUPERCONDUCTIVE QUBITS

Giulia Berti
Postdoctoral fellow, Iavarone Group, Physics department, Temple University, Philadelphia

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ABSTRACT

As the performance of superconductive qubits is severely affected by rather short coherence times, great efforts have been spent to understand sources of decoherence. In particular, complex surfaces and interfaces are believed to have a huge impact in the ultimate performance of the device since they can be hosts to decoherence sources (such as Two Level Systems, TLSs). Within this framework, one of the materials of choice for building transmon superconductive qubits is Nb. Both the Nb film/substrate interface and the interface between Nb and its top native oxide can host TLSs and other impurities that contribute significantly to decoherence and ultimately affect the performance of quantum computation and sensing. We use low temperature scanning tunneling microscopy and spectroscopy to characterize the superconducting properties of the film and its interfaces with the substrate and top oxide. Our results show that these two interfaces and their processing strongly affect the local quasiparticle density of states at the nanometer scale. The outcome of these experiments will highlight pathways to mitigate these problems and ultimately improve the performance of the next generation superconducting qubits.
This material is based upon work supported by the U.S. Department of Energy, Office of Science, National Quantum Information Science Research Centers, Superconducting Quantum Materials and Systems Center (SQMS) under contract number DE-AC02-07CH11359.

BIOGRAPHY

Giulia Berti is a postdoc in the Iavarone group at the physics department of Temple University. She did her PhD on photoemission of magnetic oxides at Politecnico di Milano and has since held other postdoc positions in surface science groups in universities and research institutes across Europe and North America.

EFFECTS OF LASERIRRADIATION OFSELF-ASSEMBLED COMPLEXES OF PHOTOSENSITIZERS WITH GLOBULAR PROTEINS

Lorenzo Brancaleon
Ph.D., Professor Department of Physics and Astronomy University of Texas at San Antonio

Lorenzo Brancaleon, Abdullah Albalawi, Omar Castillo University of Texas at San Antonio

ABSTRACT

Recent research in our group has revealed that irradiation metal-free porphyrins binding to globular proteins can cause changes in the structure of the polypep- tides under certain conditions. Beta lactoglobulin (BLG) and protoporphyrin IX (PPIX) are well -studied and helpful model. In this work, we investigated the im- pact of irradiation of a series metal protoporphyrin on the structure of BLG at acidic pH and alkaline pH. UV-Vis absorption, fluorescence, fluorescence lifetime and circular dichroism of BLG with a series of metal PPIXs including Fe, Mg, Mn, Sn and Zn were performed. Spectra were recorded by using a spectrophotome- ter to observe bleaching of the PPIXs. Fluorescence and fluorescence lifetime were taking place to monitor the changes of Trp residues in BLG. CD spectrosco- py was carried out to estimate the change in the secondary structure of the pro- tein. Our results show that the impact of laser irradiation at Alkaline pH is much larger than at acidic pH. Laser irradiation prompts large photobleaching of the Soret band at alkaline pH. The bleaching of the Soret band indicates photophysical/ photochemical events occurring with the PS ligand. Irradiation causes dra- matic changes in the Trp emission. Conformational effects on BLG produced by the irradiation of the PS at alkaline pH. All of our results would provide new in- sight and demonstrated the impact of irradiation on photosensitizer such as metals PPIX with BLG. It is believed that this work would indicate the potential application values of BLG with metals PPIX in designing pH sensitive.

SCIENTIFIC, POLITICAL, AND HUMANITARIAN ARGUMENTS CALL FOR LEADERS to organize a competition inviting all people who claim to have a solution to cancer to present their theories, calculations, proposals, summarized in a table similar to (http://bit.ly/2XI2OFz), and defend their claims in a public meeting with other proposers and experts in the field, providing references to any proposal superior to the 3D-CBS, an invention capable of saving over 100 million lives and over $27 Trillion in the next 30 years

Dario B. Crosetto[1*]
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ABSTRACT

To solve the most deadly (over 10 million lives/year) and costly (over $1.5 Trillion/year) disease, it is necessary to invite all people claiming to have a solution to cancer to present their theory/calculations/proposals, summarized in a table where the lives and costs saved each year are estimated for the next 30 years similar to (https://bit.ly/3ova8Tz), to defend their claims in a public meeting with other proposers and experts in the field and provide references to any proposal superior to the 3D-Flow, 3D-CBS and TB-CAD inventions (https://crosettofoundation.org/inventions/) which create a revolutionary paradigm change in the practice of medicine.

The 3D-Flow architecture breaks the speed barrier in real-time applications and accurately captures all possible valid signals filtered from radiation at the lowest cost per valid signal captured.

The 3D-CBS (3-D Complete Body Screening) is a cost-effective hardware tool for early detection of diseases, including cancer, that captures simultaneously all possible signals from transmitted (CT) and emitted (PET) photons (radiation) from the radioisotope (tracer) associated with proteins, nutrient molecules, etc. of all organs, recognizing anomalies in biological processes in clusters (diseases or tumors) of less than 100 body cells at €200 per test, requiring very low radiation. In comparison, current CT, MRI, Mammogram, Ultrasound, etc. can only detect large clusters (diseases or tumors) emitting signals from 1,000,000 body cells (the size of a 1mm tumor), or one billion cells/1cm^3).

TB-CAD (Total-Body Computer-Aided Diagnosis) is a powerful software tool that brings to fruition the advantages of the two previous inventions and allows the correlation of abnormal biological processes in different parts of the body to understand biophysiological functioning, prevent diseases, and improve diagnosis, prognosis, and effective monitoring of treatments, ensuring the removal of cancerous or diseased cells.

BIOGRAPHY

Dario Crosetto is the inventor of the 3D-Flow OPRA system for the discovery of new particles, and the inventor of the 3D-CBS technology which won the International Leonardo da Vinci Prize for early cancer detection from the University of Pavia, Italy. Recently he invented the TB-CAD that creates a revolutionary paradigm change in the practice of medicine. He worked 20^{+} years at CERN experiments and at the Superconducting Super Collider in Texas. He lectured at CERN School of Computing and gave seminars at prestigious universities in Europe, USA, Asia, Africa, Latin-America, and has authored 6 books and 100^{+} articles.

Andrea De Blasio
Managing Director ISENET-USA LLC
CIC Philadelphia

ABSTRACT

The major limitations in molecular clinical analysis of tissues include the cumbersome nature of procedures, limited availability of diagnostic reagents and limited patient sample size. The technique of tissue microarray was developed to address these issues.
We will describe the Galileo Family of Tissue Microarray Instruments which are constituted by different Semi-Automatic Instruments with Open architecture (e.g.: possibility to use different sizes of Tissue Blocks) and a new Fully Automated Tissue Microarray Instrument.
We will also describe the capability of the Galileo TMA Instruments to interface with the LIMS and with several Digital Scanners (Aperio, Hamamatsu, etc.) to maintain traceability through the TMA and Visual Imaging work flow with Visiopharm and TissueGnostics.

BIOGRAPHY

Andrea De Blasio is the Office Manager of ISENET-USA LLC, with the responsibility of: Manager of the Philadelphia office (Administration, MKT, Sales and Customer Service). Installation and Training of Customers on the use of the Galileo TMA Platform. Organization and management of "TMA training courses and Webinars" Drexel University, Philadelphia, PA, USA. - Bachelor of Science in Biochemistry Engineering University G. Marconi, Rome, Italy. – Industrial Engineering

Scientific publications:

- La Spada A, Tramonte T, Rainoldi B, De Blasio A. Evaluation of cross-sample contamination in tissue microarrays by polymerase chain reaction. Biopreserv Biobank. 2015;13(3):219-23.
- La Spada A, Rainoldi B, De Blasio A, Biunno I. Application of Tissue Microarray Technology to Stem Cell Research. Microarrays 2014, 3(3), 159-167.

WIDE FIELD X-RAY TELESCOPES FOR SPACE

Massimiliano Galeazzi
Ph.D., & Chair of Physics Cooper Fellow University of Miami

ABSTRACT

Micropore Optics, also called Lobster-eye Optics, offer very larger field of view, coupled to moderate angular resolution, in a compact configuration ideal for telescopes requiring small moment of inertia and rapid repointing in space. Coupling them to large area CCDs also provides good energy resolution making them ideal detectors for transient searches and rapid response X-ray telescopes.

For the past years, Prof. Galeazzi has worked on a NASA sounding rocket experiment to study and characterize local diffuse X-ray emission and on the development and characterization of instruments using micropore optics. The effort resulted in four successful rocket launches, including the first ever flight in space of Micropore Optics.

The optics will also be used for LEXI, an instrument going to the Moon next year, and are the baseline for several future NASA missions.

BIOGRAPHY

Dr. Galeazzi has worked for more than twenty years in the field of X-ray Astrophysics both in the experimental and data analysis fields. He is the PI of the DXL mission that successfully launched four times and was the first mission to successfully deploy micropore optics in space. He is also involved in data analysis and simulations from XMM-Newton, Chandra, and Suzaku. He was a Co-Investigator and member of the Science Working Group on JAXA/NASA Hitomi mission and he is part of Athena's Science Working Group.

He received his PhD from the University of Genoa, then worked at the University of Wisconsin and NASA's Goddard Space Flight Center before moving to the University of Miami where he is a Professor and Chair of the Physics Department.

In his career, he has written more than 100 peer-review publications and his work has been reported many times in the press, including CNN, Yahoo News, Sky and Telescopes, and multiple venues around the World. He is a member of the American Astronomical Society, and served on NASA's Astrophysics Advisory Committee, Sounding Rocket Working Group, and Universe Working Group.

He currently is a Cooper Fellow at the University of Miami and has been the recipient of NASA's Robert H. Goddard (RHG) Exceptional Achievement for Science Award (2016), NASA's Group Achievement Award (2016), NASA/Goddard Space Flight Center's "Center Director's Team Recognition Award" (2008), and the University of Miami "Faculty Scholarly Activity Recognition Award" (2004).

LE SFIDE TECNOLOGICHE NELLE COMUNITÀ PIÙ VULNERABILI. UNO STUDIO NELLO STATO DI CHIHUAHUA, MESSICO

Emanuele Giorgi
Ph.D., Director of Research, School of Architecture, Art and Design Tecnológico de Monterrey

Emanuele Giorgi[1], Simone Lucatello[2], Tiziano Cattaneo[3]
[1] *Escuela de Arquitectura, Arte y Diseño. Tecnológico de Monterrey. Messico*
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ABSTRACT

Basandosi nell'assunto che il sistema tecnologico sta assumendo un ruolo di principale come *driver* dello sviluppo socio-ambientale per le società contemporanee, il progetto "*Design for Vulnerables – Technology Challenge*" mira definire una strategia per facilitare l'integrazione di dispositivi tecnologici nelle comunità più vulnerabili, con il fine di superare le minacce socio-ambientali che contribuiscono a creare situazioni di vulnerabilità. Incontrare la strategia più opportuna per incentivare una diffusione ben pianificata delle risorse tecnologiche rimane una delle principali sfide per i nostri territori e ha diverse implicazioni nella pratica dell'architettura e della progettazione urbana.
"*Design for Vulnerables – Technology Challenge*" analizza, con approcci multidisciplinari, le dimensioni delle vulnerabilità in quattro comunità dello Stato di Chihuahua (Messico): (1) Paso del Norte, Chihuahua (urbano); (2) Nuevas Delicias, Chihuahua (periurbano); (3) La Regina, Julimes (rurale); (4) Basaseachic (forestale).
Per ridurre la vulnerabilità, il gruppo di ricerca sta proponendo soluzioni tecnologiche, studiando la loro assimilazione sociale, il loro impatto sullo spazio e sull'ambiente.
Le fasi di questo progetto sono:
1 – Diagnosi multidisciplinare delle vulnerabilità nei quattro contesti, per comprendere quali dimensioni debbano essere considerate prioritarie per ogni comunità;
2 – Definizione delle barriere socio-ambientali all'accessibilità tecnologica in queste comunità;
3 – Definizione delle risorse tecnologiche appropriate (a) per far fronte alle dimensioni contestuali di vulnerabilità e (b) per superare le barriere socio-ambientali esistenti nelle comunità;
4 – Valutazione dei processi di "comprensione tecnologica" e di "appropriazione comunitaria" nelle comunità.
5 – Comprendere come la progettazione architettonica e l'ambiente costruito, insieme ai cambiamenti spaziali possano contribuire, accelerare e facilitare l'assimilazione tecnologica per ridurre le vulnerabilità;
6 – Sviluppo di una startup, che mira a: (a) diffondere soluzioni tecnologiche facili e convenienti nelle comunità vulnerabili e (b) promuovere cambiamenti nelle dimensioni urbane-architettoniche al fine di integrare la tecnologia nelle comunità vulnerabili.

ROPE ACCESS, A PREVENTIVE VISION OF SAFETY

Franco Grasso
Director de IWR Academy y Ronin Lift México

ABSTRACT

Rope access is an increasingly widespread work method that has the advantage of allowing work to be carried out in remote and difficult-to-reach places. Despite having a very long history, its regulation is very recent and even the laws and regulatory frameworks are not sufficiently detailed in this regard. At the same time, there is a fairly wide discrepancy between rope access procedures and occupational health and safety standards, especially in its preventive vision for the management of the risk of falls. Starting in 2011, I start the task of investigating either the operating procedures for working with the ropes, as well as the most representative international regulatory scopes to carry out an initial harmonization that would allow us to define, first of all, the state of the art of both subjects. With these data, it was possible to start a proposal to align rope access techniques with the most transcendent current fall protection regulations. Once the main stage on safety in construction sites and workplaces has been completed, the project is now in the last stage of harmonizing these techniques with the latest principles of occupational health and safety, such as work ergonomics and prevention of occupational diseases. It should be noted that a wide discrepancy has been found in this area and the opportunity to solve it with the use of recently disseminated automatic rope access systems, in addition to the important prioritization of work methods at heights.

Keywords: rope access, rope works, working at heights, vertical works, health and safety

LEARNING ROBOT SUPER AUTONOMY

Giuseppe Loianno
Director of the Agile Robotics and Perception Lab, New York University

ABSTRACT

Autonomous robots such as aerial and ground vehicles are starting to play a major role in several critical tasks such as search and rescue, interaction with the environment, inspection, patrolling and monitoring. These tasks are generally time sensitive and require robots to be Super Autonomous or USARC: Unmanned, Small, Agile, Resilient, and Collaborative in complex, cluttered, unknown, and dynamic environments. In this talk, I will present some recent research on learning models, control policies, and collaboration to create future super autonomous robots.

BIOGRAPHY

Giuseppe Loianno is an assistant professor at the New York University, USA and director of the Agile Robotics and Perception Lab (https://wp.nyu.edu/arpl/) working on autonomous robots. Prior to joining NYU, he was post-doctoral researcher, research scientist and team leader at the GRASP Lab at the University of Pennsylvania in Philadelphia, USA. Dr. Loianno has published more than 70 conference papers, journal papers, and book chapters. His research interests include perception, learning, and control for autonomous robots. He received the NSF CAREER Award in 2022 and DARPA Young Faculty Award in 2022. He is recipient of the IROS Toshio Fukuda Young Professional Award in 2022, Conference Editorial Board Best Associate Editor Award at ICRA 2022, Best Reviewer Award at ICRA 2016, and he was selected as Rising Star in AI from KAUST in 2023. He is also currently the co-chair of the IEEE RAS Technical Committee on Aerial Robotics and Unmanned Aerial Vehicles. He was the general chair of the IEEE International Symposium on Safety, Security and Rescue Robotics (SSRR) in 2021 as well as program chair in 2019, 2020, and 2022. His work has been featured in a large number of renowned international news and magazines.

INTERNATIONAL ENVIRONMENTAL SCIENTIFIC DIPLOMACY AND GEO-7

Simone Lucatello
Ph.D., Consiglio Nazionale di Scienza e Tecnologia (CONACYT) Mexico,
Coordinatore Leader rapporto GEO 7 Programma delle Nazioni Unite (ONU) e per l'Ambiente(UNEP)

ABSTRACT

The Global Environmental Outlook (GEO) is the flagship report of the United Nations Environment Programme (UNEP) that assesses the state of the environment, the challenges it faces, and the policy responses needed to achieve sustainable development. The seventh edition of GEO (GEO-7) provides an updated analysis of global environmental trends and their impacts on human well-being, as well as the opportunities for transformative change towards a more sustainable future. GEO-7 highlights the urgent need for more ambitious and integrated policy actions worldwide to address the interlinked environmental and development challenges, such as climate change, biodiversity loss, pollution, and resource depletion. The report also emphasizes the importance of science-based assessments and the involvement of all stakeholders in designing and implementing effective solutions.

BIOGRAPHY

Simone Lucatello is a senior scientist at Instituto Mora-CONACYT (National Agency for Science and Technology of Mexico), Mexico City. He has been working over the past 20 years in scientific, academic and consultancy fields in international science and development gaining worldwide experience with national, regional and local governments, institutions, organizations, NGO´s and think-tanks for North and Latin America. His research interest deal with climate change, sustainable development, disaster risk management, humanitarian assistance among others.

He was appointed as Coordinating Leading author for the UN/IPCC Sixth Assessment report, Working Group II "Impacts, Adaptation and Vulnerability" in Chapter 14 (north America) during the period 2018-2022 and he is currently a leading author for the UNEP Geo-7 assessment report.

Dr. Lucatello holds a European Doctorate (PhD) in Governance for Sustainable Development from the University of Venice (Italy), a master's degree in international Relations from the London School of Economics and Political Science (LSE, UK) a BA in History and Politics from University College London-UK and University of Venice Cá Foscari.

He was knighted in 2021 by the President of the Italian Republic Sergio Mattarella for his services in academia and science worldwide.

NEURAL SIGNAL PROPAGATION ATLAS OF *C. ELEGANS*

Francesco Randi
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Authors: Francesco Randi[1], Anuj K. Sharma[1], Sophie Dvali[1], Andrew M. Leifer[1,2]

ABSTRACT

A fundamental problem in neuroscience is understanding how a network's properties dictate its function. Connectomics provides one avenue to predict nervous system's function. To test this explicitly, we systematically measure signal propagation in 9,692 pairs of neurons across the head of the nematode *Caendorhabditis elegans* by direct optogenetic activation and simultaneous whole-brain calcium imaging. We measure the sign (excitatory or inhibitory), strength, temporal properties, and causal direction of signal propagation between these neurons to create a functional atlas. We find that signal propagation differs from predictions based on anatomy. Using mutants, we show that extrasynaptic signaling not visible from anatomy contributes to this difference. We identify many instances of dense-core-vesicle dependent signaling on seconds-or-less timescales that evoke acute calcium transients— often where no direct wired connection exists but where relevant neuropeptides and receptors are expressed. We propose that here extrasynaptically released neuropeptides serve a similar function as that of classical neurotransmitters. Finally, our measured signal propagation atlas better predicts neural dynamics of spontaneous activity than does anatomy. We conclude that both synaptic and extrasynaptic signaling drive neural dynamics on short timescales and that direct measures of signal propagation are critical for interpreting neural function.

BIOGRAPHY

I obtained a PhD in physics from the University of Trieste, studying picosecond-timescale phase transitions in materials using pulsed lasers and computational work. For my postdoc, I transitioned to biophysics and neuroscience, focussing primarily on experimentally mapping how signals propagate through the brain of the nematode worm *C. elegans*. As a Swartz Fellow for Theoretical neuroscience I worked on theoretical and computational aspects of signal propagation in networks of neurons. I also work on some aspects of the molecular biology of neurons, including mechanisms for subcellular localization of receptors. In the summer of '22, I was a Grass Fellow at the Marine Biological Laboratory in Woods Hole, MA, working on transgenic rotifers, microscopic aquatic animals.

FREE BOUNDARY APPROACH TO MODEL GRANULAR BIOFILMS

Fabiana Russo
Research Assistant Professor in Applied Mathematics, Temple University, Philadelphia

ABSTRACT

The application of granular biofilms in engineered systems for wastewater treatment and valorisation has significantly increased over the past years. Granular biofilms have a regular, dense structure and allow the coexistence of a high number of microbial trophic groups. A mathematical model is presented to describing the *de novo* granulation, and the evolution of multispecies granular biofilms, in a continuously fed bioreactor. The granular biofilm is modelled as a spherical free boundary domain with radial symmetry and a vanishing initial value. All main phenomena involved in the process are accounted: initial attachment by pioneer planktonic cells, biomass growth and decay, substrates diffusion and conversion, invasion by planktonic cells and detachment. Specifically, non-linear hyperbolic partial differential equations govern the advective transport and growth of sessile biomasses which constitute the biofilm matrix, and quasi-linear parabolic partial differential equations model the diffusive transport and conversion of dissolved substrates and planktonic species within the biofilm granule. Non-linear ordinary differential equations describe the dynamics of substrates and planktonic biomass within the bulk liquid. The free boundary evolution is governed by an ordinary differential equation which accounts for microbial growth, attachment, and detachment phenomena. The model can be applied to cases of biological and engineering interest. Numerical simulations are performed to test its qualitative behaviour and explore the main aspects of the *de novo* granulation: ecology, microbial species distribution within the granules, dimensional evolution of the granules, and dynamics of dissolved substrates and planktonic biomass within the bioreactor.

BIOGRAPHY

I am an Italian researcher, and I am currently a Research Assistant Professor in Applied Mathematics at Temple University. I received my Ph.D. in Mathematics and Applications in 2022 from University of Naples *Federico II*. I am interested in the mathematical modelling of biological and ecological processes in the field of Continuous Mechanics. In particular, my research activity is mainly devoted to: mathematical modelling aimed to study, investigate and control the growth of complex biological systems known in literature as multispecies biofilms with specific attention to free boundary value problems; qualitative analysis of the developed models to study the solutions behaviour and properties; development of numerical methods and algorithms for the integration of the equations governing the phenomena of interest; and development of numerical simulations related to cases of biological and engineering interest.

ITALY, DO NOT STOP THE PROGRESS: CREATE IT!*

Enrico Santus
Ph.D., Data Scientist Head of Human Computation CTO Office at Bloomberg LP

ABSTRACT

Erik Brynjolfsson, professor at Stanford University, is right in saying that ChatGPT will be the writing equivalent of what calculators are for mathematics. Despite its ability of performing "intelligent" tasks, which were traditionally executed by humans, ChatGPT is however best described as a basic calculator. Upcoming models, such as GPT-4, will learn to combine linguistic patterns with visual patterns, thus being able to address an even broader range of tasks with hitherto unheard-of performance.
As these technologies progress, human-machine interactions will increase to achieve common goals. Anyone who opposes this trend will lose from the outset. If Italy does not develop these models in the near future, it will have to import them. If we do not import them, the productive and economic gap with more advanced countries will widen considerably, becoming unbridgeable once and for all. Advanced economies already recognize this, and they have been increasing their investments in research and acquisitions for some time.
Yet, these technologies do not come without risks (regulators are starting to realize it, albeit with considerable lag), this underscores once more the importance of the human role.
For this reason, youths should not be restricted from developing and using these systems, but rather they should be taught to exploit them to achieve their goals, but always keeping the right degree of mistrust and authority over the final product.
To the technological disadvantage accumulated so far, Italy needs to respond with a humanistic approach, made of vision and creativity, supported by enlightened regulations, which reduce risks without hindering progress. Our experts will have to guide the application of these technologies where it is most needed (e.g., medicine), rather than oppose it. Humanism originated in Italy, and it is prime time to recall its principles, to redesign a future in which machines empower humans without enslaving their minds. This will be one of the most important themes of the 21st century.

*** All opinions expressed in the article are my own, and they do not represent any group, institution or company to which I am associated/affiliated.**

BIOGRAPHY

Born in Sardinia, Enrico graduated in Linguistics from the University of Pisa, and obtained a PhD in Natural Language Processing from the Hong Kong Polytechnic University. He then completed two postdocs in AI for healthcare and pharma in Singapore (SUTD) and Boston (MIT). Enrico led several Microsoft grammar-checker teams, and covered the position of Director of AI & ML at Bayer. He currently works in the CTO office, at Bloomberg. He was invited to speak about AI at the White House, and contributed to AI-related factsheets for the American Congress. Enrico's projects have been featured in international press. Find more at: www.esantus.com

HUMANITIES

MODERATOR

BACK FROM OBLIVION: THE REDISCOVERY OF DOMENICO CIRILLO'S FORGOTTEN ELECTION TO THE AMERICAN PHILOSOPHICAL SOCIETY

Amedeo Arena
Professor, Università degli Studi di Napoli Federico II Dipartimento di Giurisprudenza/ Delegate for International Relations and Coordinator for the Academic Cooperation Agreements with UC Berkeley, Denver University

ABSTRACT

The story of Domenico Cirillo, a naturalist, physician, and martyr of the Neapolitan Republic of 1799, is a fascinating but little-known chapter in the history of Italian culture and the strong bond between Italy and the United States. Due to a clerical error occurred in 1768, Cirillo's election to the American Philosophical Society (APS), America's first a learned society founded by Benjamin Franklin in 1743 in Philadelphia, went unrecorded. Instead, an unknown "Professor Famitz" from Naples was entered in the Society's membership rolls.
In this talk, we will take a deep dive into the historical context surrounding this error and introduce the Italian and American intellectuals involved in it. We will explore how this mix-up might have occurred and present a possible explanation for the error.
The presentation will also highlight the research and mobilization efforts that led to the APS finally correcting this clerical error after 255 years. Finally, the presentation will highlight the implications of Cirillo's posthumous recognition for the international relevance of Neapolitan culture and science, as well as its connection with the American Enlightenment.

BIOGRAPHY

Amedeo Arena is Full Professor at the University of Naples Federico II Faculty of Law (est. 1224), where he serves as Delegate for International Relations and Coordinator for the academic cooperation agreements with UC Berkeley, Denver University, and Temple University (in progress). He is particularly interested in the relationship between Enlightenment Intellectuals from Southern Italian and the United States. In this context, he wrote on the correspondence between Gaetano Filangieri and Benjamin Franklin and curated an exhibit on that topic for the Italian Cultural Institute in San Francisco. He also conducted research that led to the recognition of Domenico Cirillo as the first Italian member of the American Philosophical Society in Philadelphia.

D'ANNUNZIO'S IL PIACERE: A FARCICAL SOCIO-POLITICAL DISSENT

Moira Di Mauro-Jackson
Ph.D., Italian Program Coordinator Department of World Languages and Literatures Texas State University, San Marcos

ABSTRACT

Critics have found difficult to separate D'Annunzio, the man—author, poet, narrator, political activist, war hero and journalist—from his work. D'Annunzio's life might at times seem even more glamorous and extravagant than his fiction. For this reason, I chose to introduce this presentation with a quote that not only equates Benito Mussolini with Gabriele D'Annunzio to immediately expose the particular context that many critics of D'Annunzio make when exploring his work, but to also allow for the wide impact that such an author made in Italian political and societal life of the times. D'Annunzio's political figure was prominent from the beginning. He would become a WWI hero, and the leader of the famous Fiume expedition after the war. Like Mussolini, he was an immensely successful public speaker, a novelist and playwright, a highly refined Dandy, but at the same time also a notorious Don Juan (Re 6). D'Annunzio had carefully fabricated and constructed his own "public image", day by day as he would the characters of his plays, poems, and novels. His adventurous life—full of war stories, aristocratic and artistic Salons and many amorous adventures—has often been compared to Andrea Sperelli's life, the protagonist of his first novel Il piacere. As a journalist, however, D'Annunzio always remained engaged with his readers and their political beliefs—by representations of decadence as a means to this end.

It is therefore imperative to begin a presentation on D'Annunzio reminding ourselves of his audacious life, his aristocratic milieu and political activism. This presentstion will center on the nature of his first, and very influential novel, Il piacere, and its effect on Italian thought at the time. In my opinion, Il piacere is truly a breviary, to borrow Cevasco's term, a bible—or in socio- economic terms, a manifesto—for its time. I will draw in what follows from Charles Altieri's Radical Poetics and from Martin Puchner's Poetry of the Revolution: Marx, Manifestos and the Avant-Gardes to prove that Il piacere is indeed a social critique of its time, an attempt of D'Annunzio to bridge the gap that an Italian Unification produced by projecting a mostly agricultural country—that had long lost his epic stature, dated back to the Renaissance years—into modern thought and society. I will focus on the important notion of propagandistic literature, and how this leads the way to an "Avant-garde" blending of "isms" as we reach the twentieth century.

I aim to show how D'Annunzio expressed in his novel his own type of propaganda for a new era, and his role as "redeemer of the nation" a key to something that could transition the newly unified Italy into the new century, a "new type of politics that would efface the distinction between private and public, society and state" (Lewis 29).Concluding that D'Annunzio's poetics is much more political than aesthetic making the claim of the author as analyst of his own historical situation and national rising political transformation.

BIOGRAPHY

Dr. Moira Di Mauro-Jackson received her PhD at the University of Texas at Austin in Comparative Literature. Her field of study revolves around French, Italian, and English Narrative and Drama of the late
19th and early 20th Centuries. Her major focus lies in the French decadent period, those works following D'Annunzio's time in Italian Literature as well as various Irish writers of the turn of the century such as Bernard Shaw, Oscar Wilde, and Yeats. Since 1987, Moira, a native Italian, has been teaching French at Texas State University in San Marcos, from where she received a Master of Arts. In 2005, Moira introduced the Italian Language Program at Texas State University and directs a Summer Abroad Program to Italy every summer. Her paper entitled "There Is No Place On Earth Like The World: Cultural and Sexual Politics in Behan's The Quare Fellow and The Hostage." has recently appeared in the volume on Prison Plays of the Rodopi Modern Literature Series. Moira is also the Vice President for the Central Texas Chapter of the American Association of Teachers of French (AATF) Executive Board (since Fall 2011) and the Regional South Central Vice President of the French National Honor Society (Pi Delta Phi (Fall 2010 - 2015). Recipient of the Fall 2020 Liberal Arts College Golden Apple Award in Teaching and the Texas State University Presidential Distinction Award in Teaching.

THE PLURAL UNIFICATION OF SCIENCES: THE CONTRIBUTIONS OF ANTHROPOLOGY TO THE INTERDISCIPLINARY DIALOGUE

Roberto Malighetti
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ABSTRACT

The paper discusses the contributions of anthropology to the interdisciplinary dialogues on the scientific status of knowledge and on the relationship between the sciences. It attributes to the discipline a privileged position, founded on the distinctive character of ethnography: the development of a scientific discourse based on a personal experience. The intense involvements of the ethnographers in the research process and in the relations with their interlocutors - as well as the relativizing and cross-cultural disciplinary outlook - question the neutrality that other sciences idealize or can more easily take for granted and challenge the ideals of objectivity. The paper proposes the notion of objectivation (i.e. the study of the condition of the constitutions of scientific objects) to think the relations among the sciences and to propose a unifying perspective, albeit open, plural and contingent.

Keywords: Anthropology, Epistemology, Method, Objectivity, Subjectivity, Objectivation, Interdisciplinary dialogue

BIOGRAPHY

Roberto Malighetti is full professor of anthropology at the Università di Milano-Bicocca and is currently visiting professor at the Università Bocconi (Milano) and at the Minzu University of China (Beijing). His main interests cover topics such as epistemology and research methods and on issue related to applied anthropology. He has done intensive fieldwork, mainly in Brazil, where he worked for almost 25 years on afro-Brazilian cultures (slavery, identities, religions, medicine), shamanism, violence, policies of marginalization and new forms of citizenship. Since 2013 his ethnographic work concentrates on the contributions of Chinese Anthropology and on the forms of religious, medical and ethnic pluralism in China.

THE QUEEN OF THE SCENES AT THE EMPEROR'S COURT
Epistolary between Adelaide Ristori e D.Pedro II, last Emperor of Brasil.

Alessandra Vannucci
Ph.D., Director and playwright Professor (UFRJ-Brazil)
Postdoctoral visiting scholar (COLUMBIA UNIVERSITY)

ABSTRACT

Adelaide Ristori was the great actress who inaugurated the transatlantic route, triumphing for half a century in theaters around the world; it is well known that at the height of her career she was jokingly proclaimed "the Dove" of Italian dramatic art. Less well known is the title of "queen of the stages" which, from 1869, the date of her first tour in South America, she received from the last Emperor of Brazil, D. Pedro II. For twenty years, until his death (1891), the two cultivated an intense friendship, mostly epistolary. They wrote to each other about literature, common acquaintances and travel; then about performances, acting styles, new props and new repertoire. Presented here is the correspondence, accompanied by photographs and notes that contextualize two such remarkable personalities, among facts and characters contemporary with them. They were outstanding observers of an era of declining monarchies, without this extinguishing their heated curiosity about the politics of the present and the imagination of the future; they were bound together by a feeling of which Ristori wrote, in her Memories, that "neither time nor distance have been able to fade in my soul."

Il is to be presented a recent book [Vannucci A. (a cura di), *Di lei attaccatissimo D.Pedro.* Perugia, Morlacchi, 2022] resulting from the collaboration between Museo Biblioteca dell'Attore (Genoa) and Fundação Biblioteca Nacional (Rio de Janeiro) on the occasion of the celebration of the actress's birth (1822-2022), under the other patronage of UNESCO. The book has been presented at the Brazilian Embassy in Italy (Nov/22) ant at Casa Italiana Zerilli Merimò/NYU (3/10/2023).

BIOGRAPHY

Italian stage director and playwright, PhD, is a professor at the Federal University of Rio de Janeiro, where she also teaches 'Creative Processes' in the PhD Performing Arts. She has been a visiting scholar at Università di Genova (2022) and actually (2023) at Columbia University. She wrote books on the topic of traveling artists, especially between Italy and Latin America, such as *Un baritono ai tropici* (Reggio Emilia 2008); *A missão italiana* (São Paulo 2014) and *Di lei attaccatissimo D.Pedro* (Perugia 2022). Recently, she focused on photography, being awarded by Instituto Moreira Salles (IMS-Rio, 2020) for researches on women refugees in Brazilian photojournalism. Her next book is, on this topic, *Outros Brasis* (Rio de Janeiro, 2023)

CONCLUSION

Professor Antonio Giordano

Education:

1980-1986 M.D. Degree, Summa cum laude. 1st Medical School, University of Naples, Naples, Italy

1987-1990 Ph. D Experimental and Clinical Pathology, University of Trieste, Italy

Professor Antonio Giordano at 26, while a post-doctoral fellow at Cold Spring Harbor Laboratory in New York, made significant contributions to the field of cancer research. His work led to the recognition that an identical protein species occurs in complexes with both a virus and with the cell cycle regulatory kinase cdc2. Later, this protein species was identified as protein cyclin A, a substance that regulates cell cycle growth. This work helped setting the stage for subsequent discovery in several other laboratories. Giordano went on to discover Rb2/p130 in the early 1990s while serving as a member of Temple's School of Medicine faculty and as a researcher at the Fels Institute for Cancer Research and Molecular Biology. Since that time, Giordano and SHRO researchers have established links between Rb2/p130 and its expression with the regression of cancer in the lungs, the aggression of cancer in the liver and ovaries, the effectiveness of drug therapies against breast cancer, and as a potential prognosticator of prostate cancer. Giordano also discovered Cdk9 and Cdk10, two protein kinases that must be activated to guarantee proper progression through the cell cycle. Research has subsequently shown that Cdk9 is a multifunctional protein that plays a critical role in cell differentiation, particularly in muscles, HIV transcription, and the inception of tumors. Recent research has focused on the role of Cdk9-55 in helping to regenerate muscle tissue in cases of muscle wasting from disease or aging.

In July of 2009, Giordano was ranked third on the list of "Laboratory Heads by Number of Publications" on the Cell Cycle Registry, attesting the relevance at international levels of his work on cell cycle regulation.

In 2004, Giordano discovered Novel Structure Proteins (NSPs), a new family of structure proteins with a possible role in nuclear dynamics during cell division. One form of the gene, the isoform NSP5a3a, is highly expressed in some tumor cell lines and could be very useful as a tumor marker. Isoforms from NSPs, a new family of genes could be involved in apoptosis or programmed cell death. Giordano also played a major role in studying the cyclin-dependent-kinase inhibitor p27 which serves as the prognosticator factor in cancer patients. Giordano's early investigation and findings on the cell cycle has contributed to a new series of drugs currently in clinical trials. In 2009, he was invited to write on this topic on *Nature Reviews Drug Discovery* in recognition of his role as a leading international researcher in this field *HEALTH AND ENVIRONMENT* | In the past few years Giordano has devoted many efforts to the study of the relation between cancer and environmental pollution in the Italian region Campania. He was among the first to report an increased incidence of various tumor types in the population living close by sites of illegal toxic waste dumping. He signed up by over 650 researchers and people in various fields; and through many other no-profit activities.

ANDREA GIUFFRIDA, PhD, MBA
www.linkedin.com/in/andrea-giuffrida-phd

Dr. Andrea Giuffrida is the vice president for strategic industry ventures and professor of pharmacology at UT Health Science Center San Antonio (UTHSCSA). He received his Ph.D. in evolutionary biology from the University of Catania, Italy, and an executive master's in business administration from the University of Texas San Antonio.

In 2011, he served as an AAAS Science & Technology Policy Fellow in the Office of Science Policy at the National Institutes of Health (NIH) working on the regulatory science of biomedical products, drug development and the NIH biannual report to the American Congress.

Between 2014 and 2021, he served as vice president for research at UTHSCSA overseeing numerous initiatives to grow the university's research infrastructure and IP portfolio, modernize research administration and compliances, promote multidisciplinary collaborative initiatives, and represent the institution with federal funding agencies, foundations, and corporate research sponsors. He also developed several seed funding programs to ensure access to the resources needed to compete at a high level for extramural funding.

In his current role as vice president for strategic industry ventures, Dr. Giuffrida oversees the office of technology commercialization, the *TechNovum* accelerator, and an umbrella of administrative programs to promote economic development strategies and entrepreneurship education across departments, schools, and institutes to drive future revenue growth. He also connects UTHSCSA ventures with business communities, interacts with funding networks seeking to invest in life science technologies, and maintains relationships with experienced CEOs and business leaders who could take on leadership roles at UTHSCSA startups.

As a scientist, Dr. Giuffrida has provided important breakthroughs to the neuropharmacology of the cannabinoid system and its role in neurodegenerative and psychomotor disorders and authored over 86 scientific publications in high impact journals. Since 2014, he is a member of the steering committee of the "Group on Graduate Research, Education & Training" of the Association of American Medical Colleges (AAMC), vice chair of the Texas Healthcare & Bioscience Institute, president of the Texas Scientific Italian Community and serves on the board of advisors of the San Antonio Chamber of Commerce and several startup companies.

USEFUL LINKS

Video messaggio Presidente Istituto Superiore Sanità, Prof. Silvio Brusaferro.
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Intervista Post XVII Conferenza su Rai Italia programma Casa Italia
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Video of XVII Conference
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