



Unmet Medical Needs

Opportunities and Challenges
for Drug Delivery Scientists

CRS Italia Workshop
Genoa, 7-9 October, 2022



Workshop Theme

After two years of virtual-only meetings, the CRS Italia workshop in October 2022 will be a great opportunity to meet again, discuss about science, and shape together the future of our society.

The theme of the 2022 CRS Italia Workshop is "Unmet Medical Needs: Opportunities and Challenges for Drug Delivery Scientists". Clinical and pharmaceutical scientists, biotechnologists and bioengineers, cancer biologists and immunologists will present on the most pressing medical needs in oncology, neurology, immunology, metabolic disorders, and elaborate on recent nanobiotechnological developments to address them. The workshop will be articulated over 5 sessions, with 10 invited speakers and 8 selected speakers among the CRS Italy community, one poster session, and one full Sunday morning Young CRS Italy Scientist session. Multiple break sessions will facilitate interactions, face-to-face discussions, and help launching new interdisciplinary collaborations. The Organizing and Scientific committees look forward to welcome you all in Genova for a vibrant meeting with a strong audience participation.

Scientific Committee

Paolo Decuzzi
Francesco Cilirzo
Pasquale del Gaudio
Ida Genta
Gennara Cavallaro
Giuseppe Colombo
Bice Conti
Giuseppe De Rosa
Piero Iamartino
Nadia Passerini
Rosario Pignatello
Massimo Pedrani
Chiara Sinico

Plenary Speakers

Ben Boyd
Monash & Copenhagen University

Dinorah Friedmann-Morvinski
Tel Aviv University

Avi Schroeder
Technion

Laura Pastorino
University of Genoa

Diego Ferone
University of Genoa

Local Organizing Committee

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Dimitrios A. Lamprou
Queen's University Belfast

Silvia Scaglione
CNR Genoa

Jai Prakash
Twente University

Raffaele De Palma
University of Genoa

Helena Florindo
Lisbon University

Giulia Pacchioni
Springer Nature London

Call for Abstracts

The CRS Italy Local Chapter is soliciting abstracts in the broad fields of drug delivery, nanomedicine, and pharmaceutical technologies. Abstracts must be submitted on-line following the instructions at www.crsitalia.it by August 19, 2022.

Acceptance will be notified by September 2, 2022. Selected abstracts will be offered a podium presentation during the regular sessions of the workshop. All the Abstracts will be presented during the Poster Session on October 7, 2022 and will be on display until the end of the workshop.

On-line registration at
www.crsitalia.it
Fees due Sept. 4, 2022.



Venue

Palazzo della Borsa di Genova
Via XX Settembre, 44
16121 Genova, Italy

Registration fees

CRS Senior € 60
CRS Junior € 30
Non-CRS Senior € 90
Non-CRS Junior € 50
Social Dinner - Oct. 8: € 45
(not included in the registration fee)
Payment method
<https://www.crsitalia.it/join-us>

Organizing Secretariat

MCR Conference
✉ info@crsitalia.it

Accommodation

A limited number of rooms are available at special rates from the following hotels:

Best Western Plus City € 105/night
Double single use - Breakfast included
📍 Via di S. Sebastiano, 6, 16123 - Genova
☎ +39 010 584 707 ✉ city.ge@bestwestern.it

Best Western Hotel Metropoli € 99/night
Double single use - Breakfast included
📍 Piazza delle Fontane Marose, 16123 - Genova
☎ +39 010 2468 888 ✉ metropoli.ge@bestwestern.it



Programme

Day one	Friday October 7, 2022 (Half Day)
13:00 - 14:00	Welcome and Registration
14:00 - 15:30	Session I (Chair: Prof. Pasquale del Gaudio and Dr. Silvia Pisani) Engineering Natural and Living Materials in Drug Delivery Prof. Ben Boyd - Monash and Copenhagen University (45 min) Prof. Dinorah Friedmann-Morvinski - Tel Aviv University (45 min)
15:30 - 16:00	Coffee Break
16:00 - 17:00	Session II (Chair: Dr. Daniele Di Mascolo and Dr. Silvia Franzè) Nanoparticles in the treatment of Neurological Disorders Dr. Agata Zamborlin - NEST, Istituto Italiano di Tecnologia (20 min) Dr. Valeria Nele - University of Naples Federico II (20 min) Dr. Debora Santonocito - University of Catania (20 min)
17:00 - 18:00	Poster Session I
Day two	Saturday October 8, 2022 (Full Day)
08:30 - 10:20	Session III (Chair: Prof. Gennara Cavallaro and Prof. Anna Scomparin) Overcoming Biological Barriers Prof. Avi Schroeder - Technion (35 min) Prof. Laura Pastorino - University of Genoa (35 min) Selected Speakers Ilaria Ottonelli - University of Modena and Reggio Emilia (20 min) Dr. Gabriella Costabile - University of Naples "Federico II" (20 min)
10:20 - 11:00	Coffee Break
11:00 - 12:50	Session IV (Chair: Dr. Michele Schlich and Prof. Rita Cortesi) Drug Delivery in Metabolic Disorders and Diabetes Prof. Diego Ferone - University of Genoa (35 min) Prof. Dimitrios A. Lamprou - Queen's University Belfast (35 min) Selected Speakers Prof. Fabio Salvatore Palumbo, University of Palermo (20 min) Prof. Giulia Auriemma, University of Salerno (20 min)
12:50 - 14:30	Lunch Break and Discussion and Poster Session II
14:30 - 16:20	Session V (Chair: Prof. Francesca Selmin and Dr. Roberto Palomba) 3D Cell Models for Drug Delivery Dr. Silvia Scaglione - CNR Genova (35 min) Prof. Jai Prakash - University of Twente (35 min)

	Selected Speakers Chiara Coricciati, CNR-NANOTEC Lecce (20 min) Prof. Filippo Rossi, Polytechnic University of Milan (20 min)
16:20 - 17:30	Poster Session III
17:30 - 18:00	CRS Italia General Assembly and Election "Board of Directors 2023 - 2025"
20:00	Social Dinner Genova Porto Antico - Ristorante "I tre Merli"
Day three	Sunday October 9, 2022 (Half-Day)
09:00 - 10:30	Session VI (Chair: Dr. Enrica Chiesa and Dr. Thomas Moore) Special Session organized by the CRS Italia Young Scientists Panelist: Dr. Giulia Pacchioni - Springer Nature London Dr. Chiara Bastianchic - University of Turin Prof. Ben Boyd - Monash and Copenhagen University Prof. Paolo Caliceti - University of Padua
10:30 - 11:00	Coffee Break
11:00 - 12:50	Session VII (Chairs: Prof. Silvia Arpicco and Dr. Sara Baldassari) Drug Delivery for Cancer Immunotherapies Prof. Raffaele De Palma - University of Genova (35 min) Prof. Helena Florindo - University of Lisbon (35 min) Selected Speakers Dr. AnnaLisa Palange, IIT Genova (20 min) Prof. Francesca Mastrotto, University of Padua (20 min)
12:50	Closure

Invited Speakers



Benjamin (Ben) Boyd, PhD

Faculty of Pharmacy and Pharmaceutical Sciences Monash University (Australia),
Department of Pharmacy, University of Copenhagen (Denmark)

Title

Developments in metabolic labelling as a potential new approach to localised drug delivery via antibody-free 'cellular Velcro'

Abstract

We have been concerned with the interaction of complex lipid particles with cells and trying to understand how particles may be 'forced' to interact with cells using antibody-free 'cellular Velcro' approaches using metabolic labelling and click chemistry. We demonstrate the labelling of a range of cells including intestinal co-cultures and have demonstrated the labelling of intestinal cells in vitro, ex vivo and in vivo in a rat model. The studies hold promise in localizing particles or other delivery vectors to specific regions of the gut.

Short Biography

Prof. Ben Boyd is a colloid and physical chemist with PhD from the University of Melbourne. After industry experience in the explosives and pharmaceutical industries, he commenced an academic position at Monash Institute of Pharmaceutical Sciences (MIPS) at Monash University in Australia. He was recently awarded a Novo Nordisk Laureate Research Fellowship, based primarily at the University of Copenhagen. His research focuses on colloidal and structural aspects of lipids, lipid self-assembly and pharmaceutical systems, and his group is active in developing new synchrotron-based characterization approaches for lipid and solid-state systems. He has held leadership positions across a range of scientific societies and is currently the Immediate Past-President of the Controlled Release Society.



Prof. Dinorah Friedmann-Morvinski

Sagol School of Neuroscience, Tel Aviv University (Israel)

Title

Novel strategies to enhance the efficacy of CAR T-cell immunotherapy in Glioblastoma

Abstract

Glioblastoma (GBM) is an extremely aggressive brain tumor with an overall survival of ~ 1 year after diagnosis. Conventional therapies have not resulted in major improvements and increasing efforts are being devoted to developing CAR T-cell immunotherapy. However, in GBM and solid tumors in general, CAR T-cell therapies face several challenges including the high level of heterogeneity, causing antigen escape, and the immunosuppressive tumor microenvironment (TME). To overcome these challenges, we propose the use of dual CAR T-cells to simultaneously recognize a novel but "conventional" tumor associated antigen expressed on the cell surface and an "unconventional" target antigen expressed in the tumor extracellular matrix. The latter antigens are generally more accessible, abundant, and stable than those located on the cell surface. In parallel, we are working on combining dual CAR T-cells with an immunomodulatory agent to revert the immunosuppressive milieu and reinvigorate T-cell effector mechanisms. This is obtained by using a lipid-nanoparticle (LNP) mRNA-based tools for in vivo targeted expression. The combination of dual CAR T-cells and nanomedicines represents a promising therapeutic approach.

Short Biography

Dinorah Friedmann-Morvinski is an Assistant Professor at the School of Neurobiology, Biochemistry, Biophysics at the George S. Wise Faculty of Life Science; a member of the Sagol School of Neuroscience; and a board member of the Cancer Biology Research Center at TAU. Her research focuses on glioblastoma. Her lab seeks to understand how tumor cells change their differentiation state and take advantage of this process to generate tumor heterogeneity and a pool of cancer stem cells. She also seeks to understand the role of the tumor microenvironment and elucidate the cross-talk between tumor cells and non-transformed cells. Prof. Friedmann-Morvinski was born in Montevideo, Uruguay where she obtained her B.Sc. in Biochemistry. She completed her postdoctoral research at the Salk Institute for Biological Studies in La Jolla, USA under the supervision of Prof. Inder Verma. She holds an M.Sc. in Biotechnology from the Hebrew University of Jerusalem and a Ph.D. in Immunology at the Weizmann Institute of Science (Prof. Zelig Eshhar's lab).



Avi Schroeder, PhD

Department of Chemical Engineering Technion (Israel)

Title

Tumor neurons and patient's gender affect the personalized activity of nanomedicines

Abstract

Medicine is taking its first steps towards patient-specific cancer care. Nanoparticles have many potential benefits for treating cancer, including the ability to transport complex molecular cargoes including siRNA and protein, as well as targeting to specific cell populations. The talk will discuss 'barcoded nanoparticles' that target sites of cancer where they perform a programmed therapeutic task. Specifically, liposomes that diagnose the tumor and metastasis for their sensitivity to different medications, providing patient-specific drug activity information that can be used to improve the medication choice. The talk will also describe how liposomes can be used for degrading the pancreatic stroma to allow subsequent drug penetration into pancreatic adenocarcinoma, and how nanoparticle' biodistribution and anti-cancer efficacy is impacted by patient' sex and more specifically, the menstrual cycle. The evolution of drug delivery systems into synthetic cells, programmed nanoparticles that have an autonomous capacity to synthesize diagnostic and therapeutic proteins inside the body, and their promise for treating cancer and immunotherapy, will be discussed.

Short Biography

Prof. Avi Schroeder is a tenured Associate Professor of Chemical Engineering at the Technion – Israel Institute of Technology, where he heads the Laboratory for Targeted Drug Delivery and Personalized Medicine Technologies (<https://www.schroederlab.com>). Dr. Schroeder conducted his Postdoctoral studies at the Massachusetts Institute of Technology, and his PhD jointly at the Hebrew and Ben Gurion Universities. Avi is the recipient of more than 30 national and international awards, including named a KAVLI Fellow, the Intel Nanotechnology-, TEVA Pharmaceuticals-, and the Wolf Foundation Krill Awards. Avi is the author of more than 60 papers, inventor of 19 patents and co-founder of multiple startup companies based on these discoveries. Schroeder is a member of Israel Young National Academy of Sciences, Israel's National Council for Civilian Research and Development, and the President of the Israel Institute of Chemical Engineers and the Israel CRS.



Pastorino Laura, PhD

Dipartimento di informatica, bioingegneria, robotica e ingegneria dei sistemi - University of Genova (Italy)

Title

Mimicking the brain microenvironment: 2D and 3D in vitro models

Abstract

In biomedical research, 3D in vitro models have gained a great attention as they can better recapitulate the in vivo microenvironment respect to traditional 2D monolayer cultures. Moreover, with the advent of patient-derived human induced pluripotent stem cells (iPSCs), 3D models are now used to more accurately model a disease and to improve drug development. However, despite great advancements in this field, examples of 3D brain tissue models are still limited. This is mainly due to the necessity of developing a soft yet stable and bioactive scaffold able to sustain neurons in long-term cultures. Recently, we demonstrated that the polysaccharide chitosan is able to sustain neuronal development in 2D and, if opportunely formulated, also in 3D. The optimized formulations were used for the encapsulation of primary neurons and of neurons differentiated from iPSCs and were found able to sustain the maturation of functional 3D neuronal networks in long term cultures.

Short Biography

Laura Pastorino received the Laurea Degree in Chemical Engineering in 1999 and the PhD in Biophysics from University of Genova in 2003. During her PhD, LP spent a period at the Louisiana Tech University working on the layer-by-layer self-assembly technique. At present, LP is Associate Professor in Bioengineering at the University of Genova, co-founder and Scientific Director of Bio3DmatriX srl and member of the Scientific Council of the Inter-University Research Center for the Promotion of the 3 R's Principles in Teaching and Research. Moreover, LP is evaluator for grant applications for the European Union. Her research interests are connected to the design of 3D composite hydrogels for neuronal engineering and to the fabrication and characterization of stimuli responsive nanosystems for drug delivery. She is an author of 90 papers in peer-reviewed scientific international journals, author of two book chapters and of many conference proceedings.



Dimitrios Lamprau, PhD

School of Pharmacy, Queen's University Belfast (United Kingdom)

Title

3D Printing for Combatting Diabetes

Abstract

Diabetes mellitus (DM) is among the top ten causes of deaths worldwide and places massive demand on health-care systems. The term DM encompasses several classifications, including type 1 diabetes (T1DM) and type 2 diabetes (T2DM). In the field of T1DM and some types of T2DM, most patients rely on subcutaneous needle injections for insulin replacement, a treatment approach highly associated with reduced patient-compliance. Pain, skin thickening due to recurring injections, needle phobia and insulin leakages on the skin surface have motivated vigorous research on Microneedle-based systems for transdermal insulin delivery. Therefore, the first part of the talk will discuss the manufacturing of 3D printed solid, dissolving, and hollow microneedles for the delivery of different molecules. The second part of the talk will focus in diabetic foot ulcer (DFU), a serious complication of DM, affecting approximately 25% of diabetic patients and resulting in lower limb amputation in over 70% of cases. Emerging technologies, such as 3D bioprinting & 4D printing, present an opportunity to improve upon current treatment strategies of DFU through the development of scaffolds.

Short Biography

Short biography: Prof Dimitrios Lamprou is Full Professor (Chair) of Biofabrication and Advanced Manufacturing at Queen's University Belfast, the Chair at United Kingdom and Ireland Controlled Release Society, and Chair of the Academy of Pharmaceutical Sciences Emerging Technologies Focus Group. Dimitrios has been recognised as world leader in Printing with PubMed-based algorithms placed him in the top 0.1% of scholars in the world writing about Printing in the last 10 years. Dimitrios, is the author of over 130 peer-reviewed publications, has over 350 conference abstracts, has given over 130 Invited Talks, and has secure Funding in excess of £2.5M. His research and academic leadership have been recognised in a range of awards. His Lab is applying Emerging Technologies (e.g., 3D Printing, 4D Printing, Bioprinting, Electrospinning, Microfluidics, Lab-on-a-chip, and BioMEMS) in the Manufacturing of Drug Delivery Systems, Medical Devices & Implants. For more info, please visit www.emergingtechnologieslab.com.



Jai Prakash, PhD

Department of Advanced Organ Bioengineering and Therapeutics, TechMed Centre University of Twente (The Netherlands)

Title

Tools to Model and Remodel the Tumor Microenvironment.

Abstract

The tumor microenvironment (TME) has been proposed as a key determinant for controlling cancer cell differentiation, proliferation, invasion, and metastasis. Cells within the TME such as cancer-associated fibroblasts, macrophages, and other immune cells interact with cancer cells and stimulate their proliferation and migration. The 2D cultures are too simple, and the in vivo models are too complex to understand the complexity of the TME interactions. It is therefore imperative to develop advanced in vitro models that mimic the TME. We have developed different 3D models to mimic various features of the TME concerning different cancer types such as breast cancer, glioblastoma, pancreatic cancer using 3D multicellular spheroids and advanced tools of the 3D bioprinting technique. There is also an unmet clinical need to develop new therapeutics to intervene in the crosstalk between cancer cells and TME. To remodel the TME, we have developed tools such as peptides to inhibit stroma formation in pancreatic cancer while nanoliposomes to re-program tumor-associated macrophages.

Short Biography

Jai Prakash is professor and chair of Engineered Therapeutics at the University of Twente in the Netherlands. He obtained his PhD (with honors) from the University of Groningen, The Netherlands and thereafter worked as vice president at BiOrion Technologies and as assistant professor at Karolinska Institutet, Stockholm. Then he joined as a tenure track professor at the University of Twente. He has published >100 peer-reviewed publications in high impact journals including Nature Communications, Science Advances, Advanced Materials, Advanced Drug Delivery Reviews, etc. He is also the founder and CSO of ScarTec Therapeutics, a biotech company developing peptide therapeutics against fibrosis and cancer. He is currently serving as the president of BeNeLux and France local chapter for the Controlled Release Society (CRS). His research interests are in designing engineered therapeutics to target and re-program the tumor microenvironment in order to develop effective therapies against hard-to-treat cancers. His group has also pioneered in developing advanced 3D in vitro models to mimic the tumor microenvironment.



Silvia Scaglione, PhD

National Research Council (Italy) & President of React4life S.p.A (Italy)

Title

A novel fluidic microphysiological system for dynamic 3D cells culture towards more predictive drugs testing

Abstract

One of the most unmet challenges of medical research is related to more predictive in vitro cellular models for both drug testing and better human biology understanding. Indeed, the preclinical assessment of novel therapies is currently carried out through traditional too simplistic 2D cell culture, and in vivo animal models, whose cost, time, and poor predictivity remain important issues. To this purpose, a novel multi-organ microphysiological system has been developed and adopted to culture different 3D human healthy/pathological tissue models under capillary blood like fluid flows that mimic cells migration and infiltration (Cavo et al., 2018), and transport therapeutic molecules by recapitulating either the oral drug administration (Marrella et al., 2020a) or the systemic route (Marrella et al., 2020b). Additionally, circulating immune cells can be co-cultured under proper physiological culture conditions to investigate their crosstalk with cancer cells, as paradigm of an immune-oncology screening platform (Marzagalli et al. 2022).

Short Biography

She received the Ph.D. in Bioengineering at the University of Genoa (I) in 2005. In 2004 she was Visiting Scientist at the University Hospital of Basel (CH). Since 2010 Scaglione is permanent Researcher (Senior researcher since 2021) at National Council of Research (CNR). She is founder and chief scientist of React4life, an Italian biotech company that develops organ on chip technologies for medical research, winning several international projects and awards, such as the Innovation Radar award from EU as best Health technology. Scaglione is author of more than 80 international peer-reviewed papers, book chapters, author of 7 patents. She has been tutoring of more than 50 master/PhD students, responsible and reviewer of several national/international research projects. Scaglione is currently PI of a Future Emerging Technology European H2020 project on a spontaneous cancer model in vitro (B2B). She is Ambassador of the European Innovation Council, and Gamma Donna Ambassador since 2021.



Giulia Pacchioni, PhD

Chief Editor: Nature Reviews Materials - Springer Nature London (United Kingdom)

Title

Publishing in Nature journals

Abstract

All academics are familiar with the process of submitting and reviewing papers, but what goes on between submission and editorial decision once a manuscript is sent to a journal and how different journals work are topics that researchers are often not exposed to. In my talk, I will give an introduction to Nature journals, providing an overview of the editorial processes and discussing what editors look for.

Short Biography

Giulia received her Master's degree in physics from the University of Milan, Italy, in 2011. She then completed her PhD studies on the investigation of nanostructures on surfaces using scanning tunnelling microscopy in the group of Professor Harald Brune at the École Polytechnique Fédérale de Lausanne, Switzerland. Giulia joined Springer Nature in October 2015 for the launch of Nature Reviews Materials. She spent 2018 heading up the launch team of Nature Reviews Physics, and since January 2022 she is the Chief Editor of Nature Reviews Materials.



Helena Florindo, PhD

Faculty of Pharmacy, Universidade de Lisboa (Portugal)

Title

Regulation of tumor immune microenvironment using advanced nano-immunotherapy

Abstract

Only a low percentage of patients achieve long lasting clinical responses to cancer immunotherapies. Non-tumor cells within the tumor microenvironment (TME) dictate the overall therapeutic efficacy. We developed nano-sized medicines to re-educate immune responses against tumors, yielding an immunological memory able to control tumor relapse without any follow-up treatment. The immunotherapeutic potential of our multifunctional nano-based immunotherapies was assessed in vivo in mouse models of melanoma, colorectal cancer (CRC) and triple negative breast cancer (TNBC), isolated and in combination with modulators of immune checkpoint function and cytokine secretion. Our nanovaccine remodeled the TME and sensitized melanoma, CRC, and TNBC to immune checkpoint therapy, significantly delaying tumor development and increasing disease-free survival rates. These nano-based immunotherapies led to the induction of a broad effector and memory anti-tumor immune response, demonstrating that our new nanovaccine constitutes a promising immunotherapy clinically translatable to defeat solid tumors.

Short Biography

Helena Florindo obtained her Ph.D. degree in Pharmaceutics in 2008 and she is currently an Associate Professor with tenure/habilitation at the Faculty of Pharmacy, University of Lisbon. Since 2015, she is the head of the BioNanoSciences – Drug Delivery & Immunoengineering Research Group, at the Research Institute for Medicines, University of Lisbon. Since 2022, she is the President of the Spanish-Portuguese Local Chapter at the Controlled Release Society. Both nanotechnology and immune-oncology fields have motivated her multidisciplinary research focused on: 1. Regulation of immunity by targeting dendritic cells to i) enhance antigen delivery and modulate antigen presentation pathways; iii) block signalling pathways related to tumour evasion mechanisms; 2. Size-based targeting of lymph node-resident immune cells by nanoparticles to overcome major barriers for vaccine components and immunotherapies; 3. Dissecting tumor stromal and immune cell interplay to guide the design of multi-targeting nano-conjugates as innovative immunotherapies.



Raffaele De Palma MD, PhD

DIMI, University of Genoa and IBBC-CNR, National Research Council, Napoli (Italy)

Title

Drug delivery to fight cancer: successes, failures and promises

Abstract

Drug delivery to fight cancer is a key issue for cancer treatment. The pivotal aim in cancer treatment is the killing of tumor cells, therefore cytotoxic drugs to induce cancer cell death and prevent cancer proliferation are the main option in the field. Despite the efficacy of cytotoxic drugs, their use is heavily hampered by their side effects since they cannot really discriminate between cancer and normal cells. Indeed, in the last decade different approaches have been attempted to deliver the antitumor drugs at the tumor site. In particular, we will discuss two main strategies, one based on the delivery of drugs using cells loaded with antitumor drugs (as for instance CD20-loaded CAR-T), the other that use nanoparticles to deliver and accumulate antitumor agents in the tumor specifically. Pros and cons will be discussed.

Short Biography

Prof. De Palma is a Clinical Immunologist. Trained in Basic Immunology, he did his PostDoc at the BRI-Medical Complex of Wisconsin working in the Immunogenetics Section (Milwaukee-USA). Visiting Scientist in several Institutions, among them the Basel Institute for Immunology (Basel-CH) and the Immunology Division of Boston Children's Hospital (Boston-USA). Clinical Researcher at the Oncology Division of Maugeri foundation, Pavia (Italy). Researcher and then Professor of Medicine at the Second University of Naples and at the University of Campania (Napoli-Italy). Currently he is Full Professor of Medicine at the University of Genoa (Italy) where he is also Director of the Division of Clinical Immunology and Translational Medicine. His main interest has always been the analysis and the characterization of immune responses and immune modulation in diseases and cancer.



Diego Ferone, MD PhD

Endocrinology, Department of Internal Medicine & Medical Specialties (DiMI), University of Genova, Italy

Endocrinology Unit, Department of Internal Medicine, IRCCS, Ospedale Policlinico San Martino, Genova, Italy

Title

Drug delivery in metabolic disorders and diabetes

Abstract

We have been concerned with the interaction of complex lipid particles with cells and trying to understand how particles may be 'forced' to interact with cells using antibody-free 'cellular Velcro' approaches using metabolic labelling and click chemistry. We demonstrate the labelling of a range of cells including intestinal co-cultures and have demonstrated the labelling of intestinal cells in vitro, ex vivo and in vivo in a rat model. The studies hold promise in localizing particles or other delivery vectors to specific regions of the gut. Either poor water solubility or other interfering activities of substances in use for active ingredients are the major barriers in the pharmaceutical industry. Many attempts in the last decades have been made to improve drugs in reaching their full therapeutic potential by enhancing bioavailability or enriching pharmacokinetic properties, to improve treatment outcomes, quality of life, and long-term recovery. Chronic endocrinological disorders offer a paradigmatic example for this approach which is progressively developing in this setting. Nanotechnology, innovative depot technology, as well as sustained drug delivery have become key in pharmaceutical product development, and here, we present the current and future potential application in severe endocrine chronic disorders such as, neuroendocrine tumors, diabetes, and adrenal insufficiency. The application of these methods for producing uniform, stable and easily targeting compounds has initiated a new era of novel drug delivery applications that will transform the healthcare sector.

Short Biography

Diego Ferone is Full Professor of Endocrinology at the Department of Internal Medicine and Medical Specialties of the University of Genoa, past General Secretary and Treasurer, of the Italian Society of Endocrinology, past Secretary of the Italian Society of Andrology and Sexual Medicine, and member of the ExCo of the European Neuroendocrine Tumor Society and the European Neuroendocrine Association. Dr. Ferone received his postgraduate degree in Endocrinology and Metabolic Diseases from Università Federico II Napoli (Italy) and his PhD in from the Erasmus University of Rotterdam (The Netherlands). He main areas of expertise are the physiopathology and treatment of pituitary disorders and neuroendocrine tumours, the physiopathology of somatostatin and dopamine receptors in the immune and neuroendocrine systems. The Italian Society of Endocrinology awarded him Best Young Investigator in 1999 and chose him for the Career Award in 2011. He received an award as Best Italian Investigator in neuroendocrine tumors field in 2010. Dr Ferone, author of more than 300 peer-reviewed articles and 50 book chapters, has presented more than 600 lectures at international and national meetings.

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