2nd International Biotechnology Conference

College Of Biotechnology

Conference Book

MUST Opera House,
Misr University for Science & Technology Giza, Egypt

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College Mission

the College of Biotechnology is committed to graduating a Biotechnology specialist according to the academic reference standards to meet the needs of local and regional labor market in the medical, pharmaceutical, agricultural and environmental sectors; conduct innovative scientific research; providing community services; and scientific consulting, within the values of improvisational

College Vision

At the College of Biotechnology, we are seeking to be academically accredited and to be one of the leading institutions locally, regionally, and internationally in the multidisciplinary biotechnology fields.

الهيئة القومية لضمان جودة التعليم والاعتماد

شهادة اعتماد

تشهد الهيئة القومية لضمان جودة التعليم والاعتماد أن:

كلية التكنولوجيا الحيوية - جامعة مصر للعلوم والتكنولوجيا

قد استوفت معايير الاعتماد المؤسسي، وقد تم اعتمادها بقرار مجلس إدارة الهيئة

رقم ٢٠٨ بتاريخ ٢٠٢١/٠٨/٣١ .

رئيس مجلس إدارة الهيئة

أ.د/ يوهانس يحيى عيد

تنتهي صلاحية هذه الشهادة في:

٢٠٢٦/٠٨/٣١

تسري صلاحية هذه الشهادة لمدة خمس سنوات، وتخضع المؤسسة طوال هذه الفترة للمتابعة والمراجعة طبقًا لنص المادة ٨، ٩ من اللائحة التنفيذية لقانون إنشاء الهيئة.

Speakers

Nadia Iskandar ZAKHARY

Professor of Medical Biochemistry, National Cancer -Institute (NCI), Cairo Univ.

English Mission Collage (primary, preparatory and secondary school). B.Sc. (Biochemistry), faculty of Science, Ain Shams Univ. Excellent with degree of honor. M.Sc. and Ph.D. (Medical Biochemistry) faculty of Medicine, Cairo Univ. Former chair of the Cancer Biology department, NCI, Cairo University. Teaching courses of biochemistry, proteomics and cancer biology in Egyptian universities and biotechnology course joined between Cairo University and Georgia Univ., U.S.A. Member in many National and International scientific organizations.

Lecture Title

"Molecular Basis of Cancer"

Lecture Abstract

1. Types of cancer.
2. The development of cancer.
3. Causes of cancer.
4. Properties of cancer cells.
5. Transformation of cells in culture.
6. What is the molecular nature of cancer?
   a. Multiple genetic changes (initiators and promoters).
   b. Oncogenes (bad genes).
   c. Tumor suppressor genes (good genes).
   d. Mismatch repair genes.
7. Types of mutations.
8. Epigenetic alterations.
9. How are oncogenes acquired?
   a. Viral infection.
   b. Mutation of proto-oncogenes.
   c. Chromosomal translocation or rearrangements.
10. How do oncogenes cause cancer?
11. What is the role of tumor suppressor genes?
12. Application of molecular biology in the field of oncology.
    a. Prevention and early detection.
    b. Molecular Diagnosis.

Therapy: Development of new targeted therapies.

Adel El Sayed Tawfik EL-BELTAGY

Chair of the International Drylands Development Commission (IDDC)
Professor, Arid Land Graduate Studies & Research Institute, Faculty of Agriculture, Ain Shams University, Egypt.

He has served as President of the Governing Board of the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM). Minister of Agriculture and Land Reclamation. Member of the Board of the Bibliotheca Alexandrina. Chair of the BA Executive Board. Member of the Technical Advisory Committee (TAC) of the Commission on Science and Technology for Sustainable Development in the South (COMSATS). Member of the High-Level Task Force on Resource Mobilization (Benefit –Sharing Fund) of the International Treaty on Plant Genetic Resources for Food and Agriculture. Board member of the World Academy of Sciences (TWAS). Board Member of the Supreme Council of Science & Technology, Egypt. Chairman of the Agricultural Research & Development Council (ARDC), Egypt, Vice Chair/Member of the board of the Global Crop Diversity Trust (GCDT). Member of the CGIAR change steering team. Council member of the Consultative Group on International Agricultural Research (CGIAR).
Chair of the Global Forum on Agricultural Research (GFAR). Member of the FAO High-Level Committee addressing the implementation of the UN millennium development goals (MDGs). Member of the European Action on Global Life Sciences (EAGLES). Member of the CDC ICWG - Climate Change. Board Member of the UN Millennium Ecosystem Assessment Board. Chairman of the CDC Integrated Natural Resource Management Committee (INRM). Chairman of the Center Directors Committee (CDC) for the International agricultural research centers of the CGIAR. Chair of the Global Consortium to Re-build Agriculture in Afghanistan. Chairman of CDC Taskforce for Central West Asia and North Africa (CWANA). Chairman of the CGIAR consortium for Sustainable Agricultural Development in Central Asia and the Caucasus (CAC).

Lecture Title

"Detection of Ochratoxin A in food production using advanced Aptasensor"

Lecture Abstract

Mycotoxin contamination is a threat to the health and life of Humans and animals. One of the most common mycotoxins contaminating feed and foodstuffs is Ochratoxin A (OTA). OTA has a chronic toxic effect and has proved to be mutagenic and carcinogenic molecule. Aptamer with their specific affinity for OTA was used in this paper to create a new analytical technique. Several methods have been reported for the determination of OTA in foods. However, most of these methods could not be applied to a complex food because the interfering native fluorescent molecules made the quantification very difficult. In this work, we mixed two separations-based techniques to identify and quantify OTA in green coffee. Aptamer assisted ultrafiltration as separation technique was applied to separate the free OTA. The quantification of OTA was established by a high-performance liquid chromatography (HPLC-FD) with LOD of 0.05 ng/mL for OTA. Artificially contaminated green coffee displayed a good range of recoveries up to 97.7%. A capacitive aptasensor was developed using this selected Aptamer for quantification of OTA based on modified anodized aluminum oxide with a LOD of 8*10-4 ng/mL. This method can be applied to the quantitative determination of OTA in green coffee at levels below the maximum levels proposed by the European Commission for green coffee 5 ng/mL to our knowledge, it is the first label-free and electric capacitive aptasensor used to detect the OTA.

Mokhtar M. El-Zawahry, M.D., Ph.D.

Professor of Molecular Medicine, Vice President, Director of R & D Center, Former Dean of Biotechnology College, Misr University for Science & Technology (MUST)

- Professor of Molecular Medicine
- Vice president for Follow-up & Documentation
- Director of Research & Development Centre
- Former Vice President of Education & Students
- Former Dean of College of Biotechnology
- Misr University for Science & Technology

Lecture Title

"Stem cells and regenerative medicine"

Lecture Abstract

In this lecture I'll attempt to clarify and focusing on: The types of Stem cells (SCs): Embryonic stem cells (ESCs), adult or somatic stem cells (SSCs) and induced pluripotent stem cells (iPSCs); the commitments of SCs differentiation during embryogenesis (totipotent, pluripotent, multipotent, oligopotent, and unipotent stem cells); the inter- and intra-cellular signaling pathways through which they operate; genetic programming of stem cells to produce different types of differentiated specialized cells; genetic reprogramming of adult cells to produce induced pluripotent stem cells (iPSCs); clinical applications of stem cells; stem cells could provide a source of an alternative graft materials; potential use of stem cells in research and in treating diseases. Health problems that might be treated by stem cell technology are neurologic disorders, spinal court injury. diabetes, burns, heart diseases, cystic fibrosis, Huntington Disease, …. and others.

Naglaa ABDALLA

Prof. of Genetic Engineering, College of Agriculture, Cairo University, Egypt.

Prof. Abdallah is a Professor in the Faculty of Agriculture at Cairo University. In 1991, she joined the AGERI at ARC as Senior. In 2019, she was appointed as Chief of Party for Center of Excellence for Agriculture, a project awarded by USAID fund with $30 million to be implemented in Egypt in cooperation with several Egyptian and US universities. In 2020, the MOHESR announced the winning of Dr. Abdallah the State Merit Award in Agriculture and food safety sectors for women in Egypt. In 2009, she was appointed Editor-In-Chief of the journal GM Crops & Food. In August 2011, Dr. Abdallah was nominated to be the Director of Egypt Biotechnology Information Center (EBIC) part of a BICs of ISAAA Knowledge Centre. In 2015, she was selected to be among the 100 most influential people in the field of biotechnology based on a survey of biotechnology and biosciences leaders who nominated biotechnology experts in industry, academia, policy, finance, law and beyond. She had several National and International Research Projects, participated as PI and Co-PI of more than 16 projects, participating with private sectors. She is coordinator of the National Biotechnology Network for Expertise.

Lecture Title

"Genome Editing Techniques in Plants: Future Prospects Towards Zero Hunger"

Lecture Abstract

Eradicating hunger and malnutrition are great significant challenges that many countries work to solve. Global climatic changes and economic downturns due to the COVID-19 pandemic are hindering the world from achieving the Sustainable Development Goals (SDGs), with a final goal of eliminating hunger by 2030. New technologies are requested to achieve zero hunger and genome editing (GE) technology is the most promising one. GE is a precise, efficient, and time-consuming techniques, that have revolutionized crop improvement by avoiding the random introduction of genetic modification, gene disruption, and unwanted genes. It can provide unprecedented solutions to food insecurity and malnutrition by developing higher yielding, more nutritious crops and resilient to the impacts of biotic stresses and climate change. In the last decade, CRISPR/Cas's system has attracted researcher as a safer and easy tool for genome editing in several living organisms. GE technology, depending on site directed nuclease (SDN) are divided into three categories according to the modification methods. Developing transgenic free edited plants without introducing foreign DNA meet the acceptance and regulatory ratification of several countries. There are several ongoing efforts from different countries are rapidly expanding to adopt the current technological innovations.

Pirta HOTULAINEN

Ass. Prof. of Biomedical Science, University of Helsinki, Finland

Throughout her career Dr. Hotulainen has been interested in the regulation of the actin cytoskeleton and how this affects cell function. Her most famous publication describes how contractile acto-myosin stress fibers assemble in migrating cells. Currently, her group focuses on the regulation of the actin cytoskeleton and membrane curving proteins in neurons. From neuronal structures, she is mostly interested in dendritic spines and axon initial segment. The ultimate goals of Dr. Hotulainen are to clarify molecular mechanisms underlying learning and to understand how brain functions differently in neurodevelopment psychiatric disorders, such as schizophrenia and autism spectrum disorder.

Lecture Title

"Dendritic spines - The memory units of the brain"

Lecture Abstract

Brain is a powerful computer. Its computing units, mainly neurons, change continuously. The dendrites of a single neuron can contain hundreds to thousands of dendritic spines. During learning, new spines will appear. At the same time, other spines and synapses, connections between neurons, will be removed. Thus, dendritic spines can be considered 'memory units 'or 'stuff that memories are made of. 'Through adding or removing, or strengthening or weakening, these units, the brain modulates its function. By reorganizing synaptic pathways, new skills are stored in the brain. In my lecture, I will discuss the molecular regulation underlying adding or removing or strengthening or weakening of the dendritic spines and how this regulation is linked to brain function.

Martin GÖTTE

Prof. of Gynecology and Obstetrics, University of Münster, Germany.

Martin Gotte obtained his M.Sc. in Biology at the University of Munster, Germany in 1994. After studying the role of Rab GTPases and SNAREs in vesicular trafficking in the laboratory of Dieter Gallwitz at the Max Planck Institute of Biophysical Chemistry in Gottingen, Germany, he obtained his Ph.D. in Biochemistry from the University of Gottingen in 1997. From 1997-2000, he studied the role of cell surface heparan sulfate proteoglycans in inflammation, angiogenesis, and tumorigenesis in the laboratory of Merton Bernfield at the Department of Cell Biology of Bostons Harvard Medical School. From 2000-2003, he was a group leader at the Institute of Physiological Chemistry and Pathobiochemistry at Munster University Hospital, Germany, studying syndecans, galactosyltransferases, proteoglycan endocytosis, and basement membrane proteoglycans. From 2001-2003.

He has been Managing Director of the biotech company Protogeneia, Inc. In November 2003, he became a faculty member of the Department of Obstetrics and Gynecology of Munster University Hospital, where he continues his work on proteoglycans and the molecular mechanisms of inflammation and malignant diseases. A second research focus is the role of stem cells and microRNAs in endometriosis. In 2011, he became Assistant Professor (Privatdozent) for Medical Biochemistry. Since 2014, he is Professor (apl) at the Medical Faculty. Prof. Dr. Gotte is a member of the German Society for Cell Biology, the Federation of European Biochemical Societies, the German Society for Endocrinology, and the International Union of Biochemistry and Molecular Biology.

Lecture Title

"Syndecan-1 as a pathogenesis factor and therapeutic target in breast cancer"

Lecture Abstract

The transmembrane proteoglycan syndecan-1 (CD138) modulates a multitude of physiological processes via binding of its heparan sulfate carbohydrate chains to multiple ligands relevant to tumor progression. Syndecan-1 is a classical coreceptor for growth factors, angiogenic factors and chemokines, and acts as a cell and matrix adhesion receptor. Syndecan-1 modulates integrin function, proteolysis, and tumor angiogenesis. The striking resistance of syndecan-1-deficient mice to mammary tumorigenesis has been linked to a potential role in cancer stem cell function. Stromal syndecan-1 is significantly downregulated upon preoperative systemic therapy of breast cancer, consistent with a possible predictive value in neoadjuvant chemotherapy. We will present data that mechanistically link syndecan-1 to several hallmarks of cancer, and to therapeutic resistance in breast cancer. At the molecular level, alterations in integrin-modulated signaling pathways, in tissue-factor driven angiogenesis, and in the stemness-associated notch signaling pathway emerge as effectors of syndecan-1 function in this context, marking a targeting of syndecan-related functions as an attractive future therapeutic approach.

Wail ABUL-KHAIR

Prof. of Stem Cells and Immunology, Cairo University, Egypt.

Dr. Wael Abou Elkheir, also known as Wael AE, M.D. has been the Vice president of Egyptian Society of Stem Cell Research since August 21, 2008. Dr. Wael serves as a Major General of the Egyptian Armed Forces & a Professor of Microbiology & Immunology at Military Medical Academy. He served as a Member of the National Stem Cell Committee of the Egyptian Ministry of Health. He served as Head of Stem Cell Therapy Unit, Sheikh Zayed Specialist Hospital, Egyptian Ministry of Health. Dr. Wael is one of the country's leading Stem cell researchers and therapy in many untreatable and devastating disorders. Dr. Wael Abou Elkheir's research focuses on regenerative medicine and translational stem cell research in in-vitro, pre-clinical and clinical trials.

Lecture Title

"Stem cell research and medical applications"

Lecture Abstract

Regenerative medicine, the most recent and emerging branch of medical science, deals with functional restoration of tissues or organs for the patient suffering from severe injuries or chronic disease. The spectacular progress in the field of stem cell research has laid the foundation for cell-based therapies of disease which cannot be cured by conventional medicines. The indefinite self-renewal and potential to differentiate into other types of cells represent stem cells as frontiers of regenerative medicine. The transdifferentiating potential of stem cells varies with source and according to those regenerative applications also change. Advancements in gene editing and tissue engineering technology have endorsed the ex vivo remodeling of stem cells grown into 3D organoids and tissue structures for personalized applications. This review outlines the most recent advancement in transplantation and tissue engineering technologies of ESCs, TSPSCs, MSCs, UCSCs, BMSCs, and iPSCs in regenerative medicine.

Chandan K. SEN

Associate Vice President of Military & Applied Research, Indiana University, USA.

Dr. Chandan K. Sen is a Distinguished University Professor at Indiana University (IU). He has been awarded the bicentennial medal by the University in 2020. At IU the School of Medicine, he serves as the J. Stanley Battersby Chair and Professor of Surgery and Director of the Indiana Center for Regenerative Medicine and Engineering (ICRME). In addition, he serves as the Associate Dean of Research. At IU, he serves as Associate Vice President of Research. At Indiana University Health hospital system, Dr. Sen is the Executive Director of the Comprehensive Wound Center. Dr. Sen is an elected fellow of the National Academy of Inventors, USA. He is also recognized as a Lilly INCITE scholar. Dr. Sen is the Indiana PI for the six center United States National Institutes of Health sponsored Diabetic Foot Consortium. After completing his Master of Science in Human Physiology from the University of Calcutta, Dr. Sen received his PhD in Physiology from the University of Eastern Finland.

Dr. Sen trained as a postdoctoral fellow at the University of California at Berkeley's Molecular and Cell Biology department. His first faculty appointment was in the Lawrence Berkeley National Laboratory. In 2000, Dr. Sen moved to The Ohio State University where he was tenured John H & Mildred C Lumley Professor of Surgery, Executive Director of The Ohio State University Comprehensive Wound Center and Director of the Ohio State University's Center for Regenerative Medicine & Cell Based Therapies. Dr. Sen's primary areas of research interest include tissue injury, repair, regeneration, and infection.

His group has pioneered the Tissue Nano transfection (TNT) technology in regenerative medicine. TNT received the 2018 Edison Awards for Innovation. Dr. Sen's work has also led to electroceutical management of tissue infection. In 2016, this technology received the Frost & Sullivan award for new product innovation. Dr. Sen has published over 350 peer reviewed publications and a dozen books which are currently cited over 40000 times in the literature. He has a current H-index of 103.

Lecture Title

"Tissue nano transfection technology for in vivo tissue reprogramming in regenerative medicine"

Lecture Abstract

Tissue nano transfection (TNT) is an electromotive gene transfer technology that was developed by Dr. Sen's group (Nature Nanotechnology, 2017) to achieve tissue reprogramming in vivo. TNT achieves safe and more deterministic in vivo topical reprogramming of the skin and beyond. TNT does not require any laboratory-based process and successfully reprograms tissue to alter tissue function. This talk will address this new technology in regenerative medicine with examples of application. A few YouTube videoclips that may help provide a good introduction to the technology are as follows:

https://youtu.be/HLcjYL4hKEU
https://youtu.be/UZ5RoRktll0
https://youtu.be/tMQ51Kj2tS0

Wagida A. ANWAR

Professor at Department of Community, Environmental and Occupational Medicine;
Faculty of Medicine, Ain Shams University, Egypt
President of PAEMSGS
President of Egyptian Environmental Mutagen Society
President of the Specialized Federation of Scientific Research NGOs, Egypt

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She is graduated from Faculty of Medicine, Ain Shams University, Egypt in December 1977. She obtained her training from several institutions in different countries (France, USA, Japan, Germany, Sweden, Canada and Finland). As a General Coordinator of Health System Improvement Programs, Ministry of Health, Egypt since 2014, she contributed in Drafting the Social Health Insurance Law (SHI), National Health Policy and Health component of the Sustainable Development Strategy 2030, which is a continuation of her contribution in Health Sector Reform Program in Egypt (1996-2002). She is the PI of several projects funded from different sources nationally and internationally. President, Pan African Environmental Mutagen Society (2017). She is the President of the Specialized Federation for Health System Improvement NGOs, since 2014. Professor Anwar received several international prizes and awards including Marie Curie, FP7, EC, (2008), Dr. A. T. Shousha Foundation Prize (WHO) for 2001, Fogarty International Fellowship Award, (1986) and the CEES Award, France (1986). Nationally, she received Ain Shams University Honorary Award, 2017, Egyptian National Award of the Academy of Sciences, (1992) and several other awards.

Lecture Title

"Genomics and public health"

Lecture Abstract

The vital advances in genomics and biotechnology, offer revolutionary insights to public health care. The understanding of the human genome structure and their functions has enabled the development of new and improved techniques for the diagnosis, control and prevention of not only genetic disorders, but also many communicable and noncommunicable diseases. The understanding of microbial genomes has pioneered inventions and improvements in diagnostics and has also stimulated drug and vaccine development. Similar advances in agricultural biotechnology and the resulting increase food and crop production bring new hope to millions of starving people across the world. The study and development of genomics and biotechnology provides us with unique opportunities to combat ill health. New avenues for minimizing and even eliminating diseases have been opened. Disease prevention techniques such as carrier detection, prenatal diagnosis, pre-implantation diagnosis and new effective vaccines are developing fast. Highly sensitive and accurate diagnostic techniques and more predictive testing technologies are now available for prevention of diseases. An array of new and effective drugs and interventions are available to cure diseases. Cures for diseases such as malaria, tuberculosis, AIDS, diabetes and cancers becoming a reality. Research in the human genome has improved organ transplant technology, and the role of biotechnology in reversing environmental degradation is now being recognized. Clearly, the technology has an enormous potential for the developing world. However, the genomic research and innovations may have their social implications. Genomics can be controversial because of its central role in issues such as reproduction, race, privacy and finance. Alarms have already been raised about eugenics, cloning, discrimination and genetic determination. The development of genetically modified foods are real public health concerns and worries. Critical social questions and serious consequences of these this type of research needs affirmative action for development of biotechnology and bioethics in Egypt.

El Sayed E. WAGIH

Prof. of Virology, College of Agriculture, Alexandria University, Egypt.

Prof. Elsayed E.Wagih has been working as Professor of Plant Pathology and Biotechnology in the Department of Plant Pathology, College of Agriculture, University of Alexandria, Egypt for almost 30 years. He obtained his M.Sc. degree in Plant Bacterial Diseases from the same university in 1981 and PhD degree in Virology from the Imperial College of Science (Technology and Medicine), University of London, UK and was awarded in the same year a DIC from the Royal College of Science.

He is also former Head of the Department and former Vice Director of research of the Biotechnology Centre of the College. Prof. Wagih Presently, he is the Acting President of "The Arab Society of Biotechnology". He served as a representative of North Africa and a member of the Governing Council of the African Crop Science Society (ACSS) since 1997 and for three successive election periods. Prof. Wagih received a number of local and international awards, prizes and certificates of appreciation, the last most important of which was the "Highest National Award for Scientific Research Achievement" awarded by The Egyptian Academy of Science and Technology in 1998 and "The Best Biotechnologist" in Egypt and the Arab world awarded by "We are Biotechnologist, WAB" assembly of Ain Shams University in 2021.Prof. Wagih has served as a member of the National Committee for Promoting University Faculty. His research involved different aspects of Molecular Plant Pathology with particular emphasis on Viral Replication, Sub-Genomic Messages in Protoplasts, Gene Expression, Protein Synthesis, Probing and cDNA Technology for Pathological studies, Gene Silencing and Genetic Engineering to Generate Virus-Resistant Transgenic Plants. Prof. Wagih has over 50 years of teaching and research experience and is the author of a series of the first and most popular and comprehensive books on Biotechnology in Egypt and the rest of the Arabic speaking countries, the latest of which were the "Encyclopedia of Genetic Engineering" (Vol.1 & Vol.2, 1500pp) published by The Canadian Academy of Sciences in 2021 and a book titled "Genetic Engineering" (Vol. I, "Principles and Techniques" and Vol. II, "Applications", 2300pp) published by the same publisher in 2022. He has also published 100 research articles in journals as author/co-author.

Lecture Title

"Antisense technology and its use in controlling gene expression"

Lecture Abstract

Antisense technology is a new and promising tool for controlling gene expression in biological systems. The term is comprehensive as it includes antisense RNA (asRNA), RNA interference (RNAi), long non-coding RNA (lncRNA), and several other enzymes and molecules. In the asRNA, synthetic antisense single-stranded oligonucleotides complementary to a specific sequence on the mRNA is used. The oligonucleotides target either pre-mRNA molecules, in the nucleus, or mature mRNA molecules, in the cytoplasm, rather than the DNA in the nucleus, or anywhere else, forming a localised double stranded structure. This dimer region may halt pre-mRNA splicing and/or prevent mature mRNA from accessing the ribosome and preventing them from being translated into the corresponding protein(s). Alternatively, this dimer structure may invite the non-sequence specific endonuclease enzyme, ribonuclease H1 that catalyse the cleavage of mRNA at its double stranded region and consequently prevent translation from completion. In the RNAi, small double-stranded RNA (dsRNA) molecules (~21–22 bp long) Known as small interfering RNAs (siRNA), produced from cleavage of longer dsRNA precursors by the RNase III endonuclease Dicer, are used. In mammalian cells, siRNAs can be synthesised by biochemical methods. In lncRNA, however, which are defined as transcripts of more than 200 nucleotides that are not translated into protein. These lncRNA molecules regulate epigenetic modification at the transcriptional level by modulating histone or DNA modification, through methylation and acetylation.These techniques of modulating gene expression are rapid and specific and have tremendous potential, both in research and in practice including agriculture for improving plant health and productivity and medicine for treating genetic, cancer and infectious diseases.

Brice SORLI

Associate Prof. of Sensors and Associated Systems, University of Montpellier, France.

Dr. Brice Sorli, (*Associate Professor*) received the M.S degree and Ph.D degree in Electrical Engineering from Montpellier University in 1998 and 2001, respectively. During this period, he worked on electronic measurements, instrumentation, thermal analysis, and humidity sensors. In 2002, he joined the "Electronic, Nanotechnologies & Sensors Lab" (INL), Claude Bernard University, Lyon where he has been involved in the design and implementation of nuclear magnetic resonance micro-probe for « Labs on chip » and in vivo applications. Since 2005, he works at the "Electronic Institute Lab" (IES), Montpellier University, on *flexible* sensors and RFID systems.

Lecture Title

"Biosensors and Bioelectronics: Interest of RFID technology"

Lecture Abstract

This presentation aims at understanding the RFID technology and how it can be coupled with a biotechnological system. Indeed, the RFID technology recently brought up to date for logistics, transport or access issues, offers the possibility to be associated with a sensor part and thus form a simple diagnostic device. What is the interest of this technology? Why and how to use it? What are the advantages and limitations? For which applications in biotechnology?

Mohamed ELHADIDY

Prof. of Biomedical Sciences, Zewail City for Science and Technology, Egypt.

Dr. Mohamed Elhadidy is currently a professor of Biomedical Sciences at Zewail City of science and technology, Egypt. Dr. Elhadidy holds a DVM degree from Mansoura University in Egypt. He obtained his master's degree in 2006 in Microbiology from Mansoura University and obtained his PhD (2010) in Microbiology from Virginia Tech University, USA. From 2011-2017, Dr. Elhadidy served as a research scientist at School of Medicine, University of Saskatchewan, Canada; University of Bristol, UK; and University of Gent and Scientific Institute of Public health in Belgium. In 2018, he also served as a visiting professor at University of Bath, UK. Dr. Elhadidy research interests are focused on population genetics, and comparative genomic studies of bacterial pathogens and investigating the ecology, epidemiology, and evolution of zoonotic pathogens causing human infection using different comparative genome analysis and population genetics studies.

His most recent research activities implemented different genomics tools to investigate the molecular characterization of different genetic markers that play a role in virulence potential, antimicrobial resistance, and transmission of methicillin resistant *Staph aureus*, shiga toxin-producing *Escherichia coli*, *Campylobacter* and *Brucell*a to human. He is an author of more than 40 international scientific publications in this field. Dr. Elhadidy is a current member of the Global Young Academy (serving as exclusive committee member and former chair from the selection committee), African Academy of Sciences, Egyptian Young academy of Sciences (EYAS), and National Microbiology Council and a former member of committee, National Academy of Sciences, USA to develop framework of faculty members in MENA region and Egypt who are better able to teach issues related to the responsible conduct of science by combining tenets of active learning pedagogical techniques.

Lecture Title

"Application of microbial genomics as a one-stop-shop epidemiological tracking of bacterial pathogens from different ecological niches"

Lecture Abstract

The ability of different zoonotic bacterial pathogens to exist in diverse environments as both a true pathogen and commensal pathogen is central to its significance for establishing meaningful One Health approach in studying bacterial evolution, epidemiology, and transmission dynamics. The research interests of our team is focused on population genetics, and comparative genomic studies of bacterial pathogens and investigating the ecology, epidemiology, and evolution of zoonotic pathogens causing human infection using different comparative genome analysis and population genetics studies., Yet, in this abstract we will demonstrate the research approach for studying the molecular epidemiology and transmission network of Campylobacter, a zoonotic foodborne that remains a leading cause for gastroenteritis and constitutes the leading antecedent for Guillain-Barré Syndrome, a severe autoimmune neuropathy. We will represent our experimental approach using microbial genomics tools to reveal the source attribution of Campylobacter emergence and transmission in Egypt to elucidate transmission networks ultimately identify interventions to address transmission. By sequencing the entire genome of Campylobacter from different potential reservoirs, we were able to identify strains, genes, individual nucleotides that are associated with different putative sources. These genetic markers can be used in quantitative source attribution models to identify the relative contribution of different reservoirs to human infection. We also identified some genotypic resistance trends that triggers transmission dynamics of antimicrobial resistance genes (ARGs) along the "farm-to-fork" continuum and highlighted the role of globally transmitted Campylobacter lineages and the emergence of (horizontally acquired) antimicrobial resistance. Our results also revealed the role of selective pressures encountered in hostile environments in shaping the epidemiology of Campylobacter in Egypt by selecting the transmission of highly adapted isolates, thus promoting the colonization of multiple host species by important disease-causing lineages. This multidisciplinary study takes a One Health approach that greatly improves the chance of identifying transmission dynamics and risk factors that can be intervened upon and will position comparative genomic surveillance to assist academics, food producers, and public health partners to control different zoonotic pathogens in Egypt.

Mansoor A. KHAN

EMDA International Establishment, Kingdom of Saudi Arabia

Dr. Mansoor A. Khan has completed his doctoral degree in Biotechnology and working in the same field for more than 30 years. He is currently affiliated with EMDA International Est. (Kingdom of Saudi Arabia) as Director, Research and Development and with MOLEQULE-ON (New Zealand) as a Regional Sales Manager. Life sciences are among the most important future-oriented areas of research, economy, and society. He facilitated several organizations with his skills in developing and troubleshooting of various instrumentations and processes. His focus is to provide a better solution to science world in most economical way.

Lecture Title

"Utilization of Next Generation Sequencing in everyday Science"

Lecture Abstract

Next-generation sequencing (NGS) is relatively a new technological platform used for DNA and RNA sequencing and variation detection. This technology has the ability to sequence hundreds and thousands of genes or whole genome in less time. This allows scientists to study the whole genome, whole exome or part of the genome to understand how the genetic code governed almost all cellular functions. The applications of next-generation sequencing have a big impact in almost all fields of biological science. The field of genomics and proteomics are most benefited with the advent of this technology. It gives new insight in many science domains including human genetics, microbiology, plant genetics, animal research and drug R&D. NGS plays a vital role in many aspects of the SARS-CoV-2 (COVID-19) that has caused a highly transmissible and ongoing pandemic all over the world. The platform of EMDA International could be used to include this technology as a part of any biological project and that can bring the answer of many unsolved questions.

Noha A. RADWAN

Lecturer of Clinical and Chemical Pathology, Faculty of Medicine, Cairo University with over 5 years 'experience in Molecular Biology

M.Sc. was in the field of Molecular Diagnosis using Real-Time RCR. M.D. was in screening of CTNS gene mutations in Nephropathic Cystinosis patients using High Resolution Melting Analysis (HRMA) and Sanger Sequencing. Practical skills have been developed for diagnosis of various diseases, including (but not limited to) automated auto-analyzers, Real-Time PCR, Next generation sequencing and High-Performance Liquid Chromatography (HPLC).

Lecture Title

"Could Sanger sequencing fill the gap in prognosis of COVID 19 outcome?"

Lecture Abstract

On 7 January 2020, researchers isolated a novel coronavirus, then called SARS-CoV-2, and COVID-19, the induced disease. A more recent emergence of interest surrounds individuals harboring variants in the Mediterranean fever gene (MEFV). In the current study, we aimed at scanning exon 10 of MEFV gene in patients admitted for COVID-10 pneumonia. Using Sanger sequencing, exon 10 of MEFV gene was evaluated in 39 patients admitted to Kasr Alainy Hospital. The most frequent heterozygous variant found was p.P706= (10.3%) followed by p.A744S (7.7%) then p.V726A (5.1%), while p.P706= was found in homozygous pattern in one patient (2.5%). Ninety percent of patients with MEFV variants had moderate symptoms and without progression into the severe form of COVID-19 pneumonia. Variants in MEFV gene may have a protective role against COVID-19 pneumonia and could be used as an early predictive marker for prognosis.

Rehab ABDALLAH

Adjunct Prof. and Postdoc fellow at the AUC, Guest Scientist at the Max Plank Institute, Germany.

Dr. Rehab Abdallah is an environmental microbiologist with substantial international experience in Microbial Biotechnology, Microbial Ecology, Microbial Biogeochemistry, and Applied Bioinformatics. In 2014, she received the International Max Planck Research School PhD fellowship from the Max Planck Institute for Terrestrial Microbiology; she was then awarded her doctorate degree in 2018. Currently, Dr Abdallah is a postdoctoral fellow at the American University in Cairo, a Guest Scientist at the Max Planck Institute for Terrestrial Microbiology. She is also an adjunct assistant professor at the American University in Cairo and Nile University. Dr Rehab main research interest is exploring the microbial communities in hypersaline lakes and paddy soil and how they respond to different environmental conditions.

Additionally, she is interested in exploring the possible biotechnological applications that could arise from the microbial communities striving in these environments. Dr. Rehab is currently the International Society for Microbial Ecology (ISME) ambassador in Egypt. She received her BSc in Biotechnology (2008) from Montana State University and her MSc from The American University in Cairo (2012).

Lecture Title

"Meta-Omics approaches to unravel Egypt's terrestrial and marine habitat unexplored microbial communities and their metabolic potential"

Lecture Abstract

Egypt is well known for its fascinating terrestrial habitats such as Gebel Elba, Mountains and Wadies of the Eastern Desert and South Sinai, as well as the Mediterranean Wetlands. Moreover, Egypt is well known for its well-known marine habitat, including the Red Sea Littoral habitats, Red Sea Islands, Red Sea Marine habitats, Mediterranean Coast, and hypersaline lakes habitats. These environments represent an unexplored natural treasure of enzymes and bioactive compounds with numerous applications in the food, pharmaceutical, textile industries. Since 2006, meta-omics approaches have been used in environmental microbiology and microbial ecology to discover bioactive compounds and the diverse bacterial and archaeal communities producing them. Meta-omics approaches have also been used to decode these microbial communities' responses to different environmental stressors. This talk will focus on the implementation of these approaches to some of Egypt's unique habitats to understand the microbial communities dwelling in them and their diverse metabolic potential. Aside from discovering novel bioactive compounds and enzymes, such approaches could also help understand soil salinization and drought effects on Egypt's agricultural soil microbial communities.

Tahsin SHOALA

Associate Prof. of Nanobiotechnology in Plant Pathology, College of Biotechnology, MUST, Egypt.

Dr. Shoala has finished his B.Sc. from Benha University, plant pathology department. He has completed M.Sc. degree from Newcastle University, UK, in recognition of thesis entitled (Identification of *Ralstonia solanacearum* subtypes by using DNA analysis). He has been awarded PhD from Newcastle University, UK, in recognition of thesis entitled (Molecular approaches to understanding Plant-Insect interaction to enhance pest control). Currently, he is working as an associate professor of Nanobiotechnology at Environmental Biotechnology Department, College of Biotechnology, Misr University for Science and Technology, Egypt. Also, he is the head of environmental biotechnology department at college of Biotechnology, Misr University for Science and Technology, Egypt.

He is the honorary president of NaQaa Nanotechnology Network NNN. Moreover, He as Certified International Professional Trainer and trained more than 500 trainees. He has published more than 35 papers in reputed journals and running number of research projects. He has organized, attended, and participated in several international conferences, workshops and meetings in UK, USA, China and UAE. His main research is focusing on Molecular of plant pathology, Plant-Insect interaction, and application of nanotechnology in plant pathology. He is a reviewer at the New Phytopathology, Journal of plant physiology and pathology, Journal of Plant Pathology & Microbiology and PSM Microbiology and nanotechnology. Also, he is the Editor-in-Chief of International Journal of Scientific Research and Sustainable Development. He is also a member in the Royal society of biology in the United Kingdom and the American phytopathology society in the USA.

Lecture Title

"Nanobiotechnological Approach to Manage Phytopathogens"

Lecture Abstract

Nanotechnology is considered as one of the key technologies that could be applied to solve many issues in our life. Application of nanotechnology has renovated the overviews for using many materials and reformed the features for different materials to make them useful for individuals. Application of nanotechnology became vast, and essential in many fields, such as phytopathogen management, diagnostic techniques, water purity, renewable energy, and production of clean energy. Nanomaterials-Plant interactions have developed many strategies towards plant resistance and production during the last few years. Nanoparticles may affect directly on the plant surfaces or induce diverse metabolic pathways, which initiate plant resistance or susceptibility in response to different stimuli. Nanoparticles may affect positively or negatively on plants in response to external stressors. Recently, Applicability of nanotechnology increased towards the innovative strategies to manage and diagnose phytopathogens.

Alexzander A. ASEA

Professor and Executive Director of the Precision Therapeutics Protogenomics Diagnostics Center at the University of Toledo College of Medicine, USA

Prof. Dr. Alexzander Asea is an entrepreneurial patent-holder President & CEO of a clinical stage biotech company, NampEVA BioTherapeutics and Professor and Executive Director of the Precision Therapeutics Protogenomics Diagnostics Center at the University of Toledo College of Medicine. His expertise lies in delivering lifesaving research and biomedical innovations within the oncology, neuroscience, biotechnology, and infectious disease arenas. He maximizes revenue by securing funding to further research, train staff and students to accept clinical trial assignments, oversee intellectual property and patents, and manage project costs. Prof. Asea serves as a trusted advisor and confidante to healthcare executives, funding entities, university and hospital staff and students, and fellow consultants.

Lecture Title

"Use of Proteogenomics in Combination with AI and ML in the Diagnosis of Triple Negative Breast Cancer"

Lecture Abstract

Currently there a critical unmet need to understand why triple-negative breast cancer (TNBC) from women of African ancestry presents with a more aggressive disease, which is often resistant to chemotherapy as compared to Caucasian women. Using the experimental approach of combination of multi omics (metabolomics, proteomics, genomics, transcriptomics), personalized medicine (breast cancer patient's clinical data before and after chemotherapy treatment) and machine learning (ML) approaches we have begun to answer this unmet need.

Didier MONTET

Prof. of Food Safety, University of Montpellier, France.

Dr D. Montet obtained his PhD in food microbiology in 1984. He conducts research in food safety and microbial ecology. He is a national expert in biotechnology and additives at the French Food Safety Agency (ANSES). He is an international expert (FAO, French embassies, international foundations). He published 230 articles and 16 books in the field of fermentations, traceability, mycotoxins. He participated to 8 European projects. He has developed a collective expertise methodology to identify food hazards.

Lecture Title

"Reduction of mycotoxicity in Malian agriculture by using biochar from cashew by-products"

Lecture Abstract

Biochars were produced from raw or pretreated cashew nut shells by pyrolysis at 400, 600 and 800°C under nitrogen. The specific surface of the different biochars ranged from 145 to 306 m²/g depending of the biomass (raw or pretreated shells) and the pyrolysis temperature. Porous volume analysis showed that these biochars were microporous. When produced at 400, 600 and 800°C, the biochar yields were 25, 22 and 20% respectively. The percentage of carbon for the different biochars varied between 70 and 87% depending on the production temperature; the pH of these carbonaceous materials was basic and ranged between 9 to 11. Biochars produced at 800°C had the best adsorption capacities for mycotoxins (aflatoxins and ochratoxin A) in aqueous solutions. Modeling with the Freundlich and Langmuir equations helped to understand the adsorption mechanism of aflatoxins and ochratoxin A respectively. The adsorption kinetics of the two mycotoxins obeys the pseudo second order kinetic model. The study of the interactions between biochar and toxigenic molds (Aspergillus carbonarius and Aspergillus parasiticus), revealed that biochar had no influence on them.

Mahmoud ABDELATY

Prof. of Quantum Information, Zewail City for Science and Technology, Egypt.

Prof. Mahmoud Abdel-Aty, is a graduate of Suhag University School of Science, Prof. Mahmoud trained Chanel, Max-Plank Institute for Quantum Optics, Germany to get Ph.D. degree. Prof. Mahmoud was Vice-President of African Academy of Sciences, Nairobi, Dean of Research and Graduate Studies, Applied Science University, Bahrain, Chairman of Mathematics, Zewail City of Science and technology, Egypt, Director of the International Relation Center, Suhag University, Professor of quantum Information, Suhag University, President of National Committee of the International Mathematics Union and Chairman of the Center for Scientific Publication, Bahrain University, Bahrain. He heads many position the latest one Director of Center for International Relations, Suhag University. Prof. Mohamed Received many local and international awards the latest; State Appreciation Award in Advanced Technological Sciences- 2021, Obtaining the Sheikh Mohammed bin Rashid Prize for Arabic Language- 2019.

Lecture Title

"Cyber security and its biological applications"

Lecture Abstract

In this work we consider different models which can be used to discuss the quantum entanglement as well as the quantum security. The exact solution is obtained either the initial state started from pure or mixed. Finally, numerical calculations are presented. It is shown that the cybersecurity will be controlled using some quantum protocols.

Nabil FIKRY

Professor of Obs. & Gynecology, Head of Scientific Council, Ministry of Interior, Egypt.

Prof. Dr. Nabil Fikry is a graduate of Kasr Al- Ainy Medical School, Prof. Dr. head of Scientific Council, Ministry of Interior, Egypt. His expertise lies in medical research especially in Cancer field.

Lecture Title

"Breast Cancer in Pregnancy"

Lecture Abstract

The incidence of breast cancer in pregnancy and the postpartum period ranges from 2 .3 to 40 cases per 100 000 women. Over 90% of patients with breast cancer in pregnancy or during lactation present with a palpable mass, and most often (84%) these are self-reported by patients. Less frequently, breast cancer will present as breast erythema, breast swelling, bloody nipple discharge, or local or distant metastasis. The histology of tumors appears to be similar in women who are pregnant or recently delivered and in age-matched women who are not pregnant. However, the stage of disease at diagnosis is more advanced in women who are pregnant or recently delivered and consequently incurs a worst prognosis, likely due to a delay in diagnosis.

Gargi Roy GOSWAMI

Prof. of Dental Genetics, Founder and Director at KROYNAS Pvt. Ltd, India

Dr Gargi Roy Goswami is a dental geneticist. She is the Founder and Director of KROYNAS Pvt. Ltd. and the Indian Academy for Clinical and Dental Genetics (IACDG). Founder and Chairman of International Saliva Summit of India, an honorary invited Peer Reviewer for the National Research Foundation, South Africa and former faculty at IDA, Mumbai. She has initiated a voluntary endeavour named COGNUS (Community for Engrossing and Novel Undergraduate Science) to promote undergraduate research in India as well as their holistic upliftment. She is one of the coveted speakers at the Dental Reach Digital Conference & Awards (DRDCA) 2020 International.

Lecture Title

"Saliva Diagnostics & CoVID19 Detection- The New Hope of The Pandemic"

Lecture Abstract

COVID-19 pandemic has immensely influenced the healthcare and economic status of every country in the world. The morbidity and mortality caused by this pandemic have led to the emergence of various SARS- CoV-2 detection methods. Improved detection technologies make way for early, rapid, and accurate diagnosis of the disease. The knowledge of the operating principle of each diagnostic technique gives perspective on analyzing the most appropriate diagnostic tool for the present scenario. The potential areas of diagnosis include population screening, testing in under-served populations, school testing, vaccine trials, and epidemiological research. This lecture focuses on the current status of COVID-19 diagnostic methodologies highlighting point-of-care tests that utilize saliva specimens as the testing matrix. Saliva research has emerged globally as a boon to diagnose the deadly virus because it aids in early detection of SARS-CoV-2. This lecture is an attempt to create awareness in the scientific community about the global market scenario for salivary diagnostics and to elucidate the promising futuristic role of saliva in the accurate diagnosis of COVID-19.

Magda ASEM

Prof. of Clinical Pathology, NCI, Cairo University, Egypt.

- ✓ Graduated from kasr El aini medical school
- ✓ Predoctorate training at institute Gustave Roussey, Paris France for one year.
- ✓ Postdoctorate Fulbright scholarship at NIH, Bethesda Meryland USA for six months.
- ✓ Head of the clinical pathology dept for one year.

Lecture Title

"Diagnostic and prognostic potential of several Circulating MiRNAs in Acute Myeloid Leukemia"

Lecture Abstract

Acute myeloid leukemia, the most common acute leukemia in adults is a heterogeneous group of hematopoietic neoplasm. An aggressive disease with dismal outcome. microRNAs (miRNAs} are small non-coding RNA which regulate the expression of target mRNA at both the transcriptional & translational levels. Recently, it was reported that the heterogeneity of AML can be resolved based on their differential mRNA's expression levels. Data are coming up to reveal distinctive mRNA signatures that characterizes two subgroups AML with different mechanisms of leukemogenesis Core binding factor (CBF) & cytogenetically normal AML(NK_AML) with mutations in NPM1&FLT3_ITD.also an inverse correlation of expression levels between miRNA & their target genes was documented in specific AML genetic groups. We will present the data of five different Egyptian cohorts whereby the expression of miR_29a.miR_92a.miR_143.miR_342.miR_204 was measured using quantitative real-time PCR. Reduced levels of miR_29a, miR~92a, miR_143 significantly affected OS & DFS across the cohorts.

Postinduction levels of miR_92a were significantly higher in patients who achieved CR compared to who did not. (Median range 0.408(0.017_3.438) vs (0.001_1.010). Cox hazard regression analysis identified miR_92a as a significant predictor of OS & DFS in univariate & Multivariate analysis. Thus, miR_92a was identified as a marker of treatment response & survival in adult AML.

Ola KHORSHID

Professor of Medical Oncology, Cairo University, Egypt.

Dr Ola Khorshid is currently a Prof. of Medical Oncology, Malignant Hematology & BMT, Medical Oncology Department NCI, Cairo University. She is the Chairman & Founder of Millennium HealthCare Group. Cofounder of Orchid Oncology Center. Secretary General of the Mediterranean Multidisciplinary Oncology Forum (MMOF(. She received her master (1998) and PhD (2004) degrees in medical oncology and hematological malignancies from the NCI Cairo University. She has been ESMO certified since 2006. She has trained in MD Anderson Cancer center 2002 and was a Post-Doctoral Fellow in MDAnderson Cancer center, Blood and Marrow transplant department, Developer of Medical oncology curriculum for Medical Oncology Fellowship for the Egyptian Fellowship Board 2008. She is an examiner in the master's degree of Medical Oncology Cairo University.

She was Secretary General of the Egyptian Hemato Oncology Group (EHOG) 2008-2011. She was the clinical instructor and medical oncologist at Dar Al Fouad Hospital during the period from August 2004 to June 2005: was the person in charge of developing the SOP and all requirements for the Joint Committee of International Accreditation. She is the winner of the Cairo University Achievement Award for 2011. Dr Khorshid is currently an assistant editor of MEDITERRANEAN ONCOLOGY JOURNAL –M.O.J. she has several international publications in SCT, hematological malignancies and solid tumor. Her main research interest is in NSCLC, Breast Cancer, Lymphoma, Leukemia & BM.

Lecture Title

"Utilization of Next Generation Sequencing in everyday Science"

Lecture Abstract

Next-generation sequencing (NGS) is relatively a new technological platform used for DNA and RNA sequencing and variation detection. This technology can sequence hundreds and thousands of genes or whole genome in less time. This allows scientists to study the whole genome, whole exome, or part of the genome to understand how the genetic code governed almost all cellular functions. The applications of next-generation sequencing have a big impact in almost all fields of biological science. The field of genomics and proteomics are most benefited with the advent of this technology. It gives new insight in many science domains including human genetics, microbiology, plant genetics, animal research and drug R&D. NGS plays a vital role in many aspects of the SARS-CoV-2 (COVID-19) that has caused a highly transmissible and ongoing pandemic all over the world. The platform of EMDA International could be used to include this technology as a part of any biological project and that can bring the answer to many unsolved questions.

Emad Mahmoud ELZAYAT

Prof. of Molecular Physiology & Biotechnology
Head of Zoology Department, Faculty of Science, Cairo University
General Coordinator of Bio nanotechnology Program, Faculty of Postgraduate Studies for Nanotechnology, Cairo University (Sheikh Zayed Branch)
Head of Cell Culture & Stem Cell Research Lab, Zoology Department, Faculty of Science, Cairo University

PhD. In Molecular Physiology, Clinical Molecular Biology Department, Research Institute for Child Nutrition, Dortmund, Germany in 1988. Diploma in Biotechnology, Tokyo Institute of Technology (TIT) in 1997. Postdoctoral Research Fellow, Tissue Culture Lab, Department of Nutritional Toxicology, German Institute of Nutritional Research (DIFE), Potsdam, Germany (April, 1996-Oct., 1996). Postdoctoral Research Fellow, Department of Bioengineering, Tokyo Institute of Technology, Tokyo, Japan (Oct., 1996-Sept., 1997). Postdoctoral Research Fellow, Department of Molecular Genetics, University of Kaiserslautern, Kaiserslautern Germany (July, 1999-August, 1999).

Lecture Title

"Bee venom and its active component Melittin synergistically potentiate the anticancer effect of Sorafenib against HepG2 cells"

Lecture Abstract

There are current attempts to find a safe substitute or adjuvant for Sorafenib (Sorf), the standard treatment for advanced hepatocellular carcinoma (HCC), as it triggers very harsh side effects and drug-resistance. The therapeutic properties of Bee Venom (BV) and its active component, Melittin (Mel), make them suitable candidates as potential anti-cancer agents per-se or as adjuvants for cancer chemotherapy. Hence, this study aimed to evaluate the combining effect of BV and Mel with Sorf on HepG2 cells and to investigate their molecular mechanisms of action. Docking between Mel and different tumor-markers was performed. The cytotoxicity of BV, Mel and Sorf on HepG2 and THLE-2 cells was conducted. Combinations of BV/Sorf and Mel/Sorf were performed in non-constant ratios on HepG2. Expression of major cancer-related genes and oxidative stress status was evaluated and the cell cycle was analyzed. The computational analysis showed that Mel can bind to and inhibit XIAP, Bcl2, MDM2, CDK2 and MMP12. Single treatments of BV, Mel and Sorf on HepG2 showed lower IC50 than on THLE-2. All combinations revealed a synergistic effect at a combination index (CI) < 1. Significant upregulation ($p < 0.05$) of p53, Bax, Cas3, Cas7 and PTEN and significant downregulation ($p < 0.05$) of Bcl-2, Cyclin-D1, Rac1, Nf- κB, HIF-1a, VEGF and MMP9 were observed. The oxidative stress markers including MDA, SOD, CAT and GPx showed insignificant changes, while the cell cycle was arrested at G2/M phase. In conclusion, BV and Mel have a synergistic anticancer effect with Sorf on HepG2 that may represent a new enhancing strategy for HCC treatment.

Ahmed HASHASH

Prof. of Regenerative Medicine, University of Southern California, Keck School of Medicine, USA.

Professor Ahmed Hashash has completed his PhD from Manchester University, UK. He is a fellow of the California Institute of Regenerative Medicine (CIRM) and New York University Medical School (MSSM), USA. Prof. Ahmed Hashash worked as a senior biomedical research scientist at Mount Sinai School of Medicine of New York University and Children's Hospital Los Angeles. He was Assistant Professor and Principal Investigator of Stem Cell & Regenerative Medicine at Keck School of Medicine and Ostrow School of Dentistry of The University of Southern California, USA. In 2016, Prof. Hashash has joined The University of Edinburgh, Edinburgh Medical School-Zhejiang International Campus, (ZJU) as Tenure-Track Associate Professor and Senior Principal Investigator of Biomedicine, Stem Cell & Regenerative Medicine. He is also adjunct Professor at the School of Basic Medical Science and School of Medicine, Zhejiang University.

Prof. Hashash has several breakthrough discoveries in genes/enzymes that control stem cell behavior and regenerative medicine. He has published more than 34 papers in reputed international journals and serving as an editorial board member of repute. Prof. Hashash has received several international awards and recognitions over the years, including being the nominee for the prestigious One-Thousand talent project prize (Zhejiang, China), and Kuwait Foundation for the Advancement of Science's (KFAS) Prize in Applied Medical Sciences, and Manchester University Fellowship Award (UK). In, addiction, Prof. El-Hashash acts as a discussion leader at the prestigious Gordon Research Seminar/ Conference in USA, and a Peer Reviewer/ International Extramural Review for The Medical Research Council (MRC) grant applications, London, UK. He is invited to speak at several international conferences in USA, Spain, Greece, Egypt and China. He is the editor or author of several books on stem cell and regenerative medicine.

Lecture Title

"Stem cell Technology in lung repair, regeneration, and diseases: Current applications and future promise"

Lecture Abstract

Tissue engineering and cellular therapies have a remarkable potential to significantly impact medicine/biomedicine. Lung diseases are major cause of morbidity and mortality worldwide. The progress in regenerative medicine and stem cell research in the lung are currently a fast-growing research topic that can provide solutions to these major health problems. Under normal conditions, the rate of cellular proliferation is relatively low in the lung in vivo, compared to other major organ systems. Lung injury leads to the activation of stem/progenitor cell populations that re-enter the cell cycle. Yet, little is known about stem cells in the lung, despite common thoughts that these cells could play a critical role in the repair of lung injuries. Nor do we fully understand the cellular and architectural complexity of the respiratory tract, and the diverse stem/progenitor cells that are involved in the lung repair and regeneration. In this talk, we will present and discuss the conceptual framework of lung stem/progenitor cell biology. We will also describe our research studies and related research by others on some lung diseases, in which stem cell manipulations may be physiologically significant. Furthermore, we highlight the challenges of lung stem cell-based therapy.

Menattallah ELSERAFY

Ass. Prof. of Genomics, Zewail City for Science and Technology, Egypt.

Menattallah Elserafy is an Assistant Professor at Center for Genomics, Zewail City of Science and Technology (ZC). She is also a lecturer of undergraduate and postgraduate students of ZC. Menattallah did her MSc and PhD in Heidelberg University in Germany. She started her postdoctoral research at Center for Genomics in 2015 and was appointed as a faculty member in 2020. During her postdoctoral time, she has received the L'Oreal-UNESCO fellowship for women in science, Egypt and Levant in addition to the International Rising Talents fellowship by L'Oreal-UNESCO. She was also selected by COMSTECH to attend the 68th Nobel Laureate Meeting dedicated to physiology and medicine, in Lindau, Germany. Moreover, she received several research grants including the CRP-ICGEB Early Career Return Grant, a re-integration grant from the Egyptian Science and Technology Development (STDF) and the joint ASRT-BA fund by The Egyptian Academy of Scientific Research and Technology and Bibliotheca Alexandrina (BA).

Menattallah is a Next Einstein Forum (NEF) fellow, an African Academy of Sciences (AAS) affiliate and a member of the Egyptian young academy of sciences (EYAS). She is also a global young academy (GYA) member and a co-lead of the women in science working group.

Lecture Title

"Transcriptional analysis of nuclear-encoded mitochondrial genes in eight neurodegenerative disorders: the analysis of seven diseases in reference to Friedreich's ataxia"

Lecture Abstract

Neurodegenerative diseases (NDDs) are challenging to understand, diagnose, and treat. Revealing the genomic and transcriptomic changes in NDDs contributes greatly to the understanding of the diseases, their causes, and development. Moreover, it enables more precise genetic diagnosis and novel drug target identification that could potentially treat the diseases or at least ease the symptoms. In this study, we analyzed the transcriptional changes of nuclear-encoded mitochondrial (NEM) genes in eight NDDs to specifically address the association of these genes with the diseases. Previous studies show strong links between defects in NEM genes and neurodegeneration yet connecting specific genes with NDDs is not well studied. Friedreich 's ataxia (FRDA) is an NDD that cannot be treated effectively; therefore, we focused first on FRDA and compared the outcome with seven other NDDs, including Alzheimer's disease, amyotrophic lateral sclerosis, Creutzfeldt– Jakob disease, frontotemporal dementia, Huntington's disease, multiple sclerosis, and Parkinson's disease. First, weighted correlation network analysis was performed on an FRDA RNA-Seq data set, focusing only on NEM genes. We then carried out differential gene expression analysis and pathway enrichment analysis to pinpoint differentially expressed genes that are potentially associated with one or more of the analyzed NDDs. Our findings propose a strong link between NEM genes and NDDs and suggest that our identified candidate genes can be potentially used as diagnostic markers and therapeutic targets.

Curigliano GIUSEPPE

Clinical Director, Division of Early Drug Development for Innovative Therapy, European Institute of Oncology, Italy

Giuseppe Curigliano, MD, PhD, is Chair of the Division of Early Drug Development at European Institute of Oncology, in Milan, Italy, where besides his clinical work. He is a clinician and researcher specializing in breast cancer. He is an active member of the American Society of Clinical Oncology (ASCO), the European Society of Medical Oncology (ESMO) and the Associazione Italiana di Oncologia Medica (AIOM). He is founding member of/and scientific coordinator for the International Cardio-Oncology Society (ICOS). He serves on the Clinical Research Committee of the AIOM. He serves as faculty member in the European School of Oncology (ESO). He is member of the Scientific Advisory Committee of the International Breast Cancer Study Group (IBCSG) and served for the Breast International Group (BIG). He is ESMO and ESO Faculty Member for Breast Cancer. Dr. Curigliano has written widely on oncology (more than 180 peer reviewed article, most of them as first author and several book chapters). He is member of the Editorial Board of Journal of Clinical Oncology, Annals of Oncology, Cancer Treatment Review.

Lecture Title

"Treatment of HER2 positive Metastatic Breast Cancer"

Lecture Abstract

For decades, the systemic treatment of localized triple negative breast cancer (TNBC) has exclusively relied on chemotherapy. Recent advancements, however, are rapidly reshaping the treatment algorithms for this disease. The addition of pembrolizumab to neoadjuvant chemotherapy has indeed shown to significantly improve event-free survival for stage II-III TNBC, leading to its establishment as new standard of care in this setting. This landmark advancement has however raised several important scientific questions. Indeed, we desperately need strategies to identify upfront patients deriving benefit from the addition of immunotherapy. Moreover, the best integration of pembrolizumab with further recent advancements (capecitabine, olaparib) is yet to be defined. Lastly, extensive efforts are needed to minimize the impact on patients of immune-related adverse events and financial toxicity. The next decade of clinical research will be key to overcome these challenges, and ultimately learn how to optimally integrate immunotherapy in the treatment landscape of TNBC.

Mohammad HEGAZI

Prof. of Cardiology, Cairo University, Egypt.

Dr. Mohammad Hegazi, MD is a graduate of Cairo University School of Medicine, Dr. Hegazi trained at the Cairo; Japanese teamwork for pediatric-cardiology Cardiac Catheterization Diagnostic and intervention ant therapeutic and diagnostic catheterization training course and workshops - British team and many other professional trainings. Dr. Hegazi was Head of Pediatric cardiology department and cath. lab. in Pence sultan cardiac center Al Hassan, Ebin al Nafees hospital, Casablanca, Morocco, Cardiac center -Dubai-AUE, and many other hospitals in Egypt. Moreover, his academic career starts since he was teaching assistant for the students of Bachelor of Medicine and general surgery, Cairo university until now as professor in the department of pediatrics and the pediatric cardiology unit, Abu El Rish, faculty of medicine, Cairo university.

Lecture Title

"Cardiac glue: is it a dream or true?"

Lecture Abstract

Amphibians, salamanders can regenerate some tissues especially heart. This regenerative power is claimed to be due to presence of some transcription and growth factors in these organs that initiate the tissue-specific stem cells in both heart and limbs to stimulate the process of proliferation, differentiation, and complete regeneration. On the other side, the science of nanotechnology has introduced different biocompatible natural materials like chitosan and collagen that can be fabricated in the form of nanomembrane. We hypothesize that a type of cardiac matrix-like glue could be made via the technology of tissue engineering and nanotechnology. Clinical application of this glue can be used in the management of congenital heart defects like ASD, VSD and PDA as a novel therapy approach. We are aiming to create an engineered texture from nanomembrane loaded with growth factors and stem cells like those of salamander as therapeutic approach for management of congenital cardiac defect.

Amr AGAIZ

Professor at Faculty of Biotechnology, MSA University.
Professor at Genomics, Proteomics and Bioinformatics Facility, Agricultural Genetic Engineering Research Institute (AGERI).

Received Ph. D. in 2005 from The University of Tokyo, Japan. 2011-2015, headed the nucleic acid and protein chemistry department at AGERI. Personal investigator and joined many STDF projects in bacterial identification and genome analysis. Teaching Bioinformatics and pharmacogenomics at MSA University.

Lecture Title

"Designing multi-epitope vaccine against SARS-CoV-2 delta variant"

Lecture Abstract

As of August 2021, the delta variant of SARS-CoV-2 became the main variant of concern in the world. The delta variant possesses an improved immune evasion, and breakthrough infection after complete vaccination. This study reports the design of a multi-epitope vaccine against the SARS-CoV-2 delta variant. The vaccine contains the D614G and P681R mutations highly conserved in the B.1.617 lineage and responsible for viral infectivity and fitness. The designed vaccine was predicted to be antigenic, non-allergenic, and thermostable. The GRAVY index of vaccine construct was found to be -0.063. The estimated half-life of the vaccine protein in mammalian reticulocyte (in vitro) was estimated as 30 h, while it was >20 h and >10 h in yeast and Escherichia coli (in vivo), respectively. Docking studies revealed stable interactions of the vaccine with Toll-Like Receptor 4. The designed vaccine can be a potential vaccine candidate against SARS-CoV-2 including the delta variant.

Mariena van der PLAS

Associate Prof. of Health and Medical Science, University of Copenhagen, Denmark.

Mariena van der Plas is an associate professor at the Leo Foundation Centre for Cutaneous Drug Delivery. Researcher specialized in skin and wound infections, inflammation, innate immunity, signal transduction, bacteria and biofilms, hemostasis, protein purification, peptidomes, wound healing and maggot therapy. She has over 15 years of experience within the field of understanding and targeting wounds and skin diseases.

Lecture Title

"Host defense peptides in health and disease"

Lecture Abstract

Over the last few decades, antibiotic resistance development in bacteria has become an increasing issue in human medicine. As more antibiotics have become ineffective, focus has shifted towards alternative antimicrobial therapies. Especially host defense peptides (HDPs) have attracted significant attention owing to their ability to kill a broad spectrum of microbes while modulating immune responses. Using peptidomics-based LC-MS/MS, we found that various HDPs, including thrombin-derived C-terminal peptides (TCPs), are released during wound healing and infection. Furthermore, we showed that TCPs are released from thrombin by proteolytic cleavage, exert antimicrobial effects against fungi, Gram-positive and Gram-negative bacteria, and suppress coagulation, cell activation and pro-inflammatory responses. Finally, the therapeutic potential of TCPs was investigated in a porcine wound infection model. Together, HDPs like TCPs are promising candidates for the treatment of infection and inflammation.

Hussein SABIT

Prof. of Cancer Epigenetics, College of Biotechnology, MUST, Egypt.

Hussein Sabit (Cairo, Egypt, 1974) has been graduated from Ain Shams University, Cairo, and received his BSc in Genetics (1997), where he also gets his MSc (2002) in Microbial Genetics and PhD in Molecular Genetics (2007). He joined Misr University for Science and Technology, Egypt as TA (2003), Assistant Professor (2007). Has been promoted to Associate Professor of Molecular Genetics (2012), and for Full Professors in Cancer Epigenetics (2017). His research interest is Cancer Genetic/Epigenetic basis of carcinogenesis, genome editing via CRISPR/Cas9, studying the anti-apoptotic genes and its relations with BC progression, investigating the DNA methylation levels controlling carcinogenesis of BC, studying the chromatin remodeling as the main mechanism leading to cancer using ChIP assays and others. He published more than 65 articles; most of them are in the main field of Cancer Genetics/Epigenetics.

He joined the Institute for Research and Medical Consultations (IRMC), Imam Abdulrahman Bin Faisal University, KSA as a professor of Cancer Epigenetics (2018-2021). He has a strong background in under- and postgrad education (18 years). He attended more than 25 international conferences on Cancer Genetics/Epigenetics in many countries including France, Italy, Germany, Hungary, Spain, Canada, SA, Turkey, in addition to workshops held on the same discipline of science during the last 12 years. He mentored and supervised 23 candidates (17 MSc and 5 PhD) in various fields in Genetics (2011-2018). He participated in more than 40 seminars and symposia where he was the keynote speaker. He attended more than 50 WS and symposia in different fields of Genetics/Epigenetics (2008-2018). He participated in establishing the undergraduate and postgraduate studies in the College of Biotechnology, MUST, where he became in the year 2014 the Vice Dean for Environmental Affairs, member of the IRB (2013-2018), postgrad committee (2012-2018), foreign affairs (2017-2018), and recently, he assigned as a Vice Dean for Graduate Studies and Research (2021-now).

Lecture Title

"CRISPR/Cas9-mediated activation of CDH1 suppress metastasis of breast cancer in rats"

Lecture Abstract

Cancer is a life-threatening disease that affects approximately 18 million individuals worldwide. Breast cancer is the most common female neoplasm globally with more than 276,480 new cases of invasive breast cancer expected to be diagnosed in women in the U.S. alone in 2020. Genetic and epigenetic factors play role in the carcinogenesis and progression of this disease. In this study, MCF-7 adenocarcinoma cells were transfected with CRISPR/Cas9 plasmid to either knock out CDK11 or to activate CDH1. Treated cells were allografted into the mammary glands of female rats (150–190 g, 6–8 weeks) to evaluate the capability of these cells to control cancer progression and metastasis.

Ahmed El-Zawahry

Associate Prof. of Urology, Illinios University, USA.

- ✓ Associate professor of Urology and director of bladder health and pelvic floor reconstruction at the University of Toledo Medical Center.
- ✓ Graduated in Faculty of Assiut University in Egypt, did Urology residency in Egypt then another residency at the Medical University of South Carolina (MUSC).
- ✓ Post-doctoral fellowship in prostate cancer and management using Adenovirus gene therapy, breast cancer gene therapy and colon cancer gene therapy.
- ✓ Fellowship in Voiding Dysfunction/ Female Urology/Urogynecology/Pelvic Floor Reconstruction/Neurourology at MUSC.
- ✓ Focus is on Male and Female pelvic floor reconstruction, prosthetics and endourology, prostate disease and bladder dysfunction.

Lecture Title

"Cell-free DNA and its future role in diagnosis of urinary tract cancer"

Lecture Abstract

Urinary bladder cancer is a common urological cancer. Bladder cancer is the tenth most common cancer types in the world and sixth in men. Its detection is mostly employed through cystoscopy, but it is expensive, invasive, and uncomfortable to the patients. Recently, urinary cell free DNA (ucfDNA) isolated from urine supernatant has been shown to have a great potential in bladder cancer detection, diagnosis, and surveillance. The integrity and concentration of ucfDNA has been shown to be useful for differentiating bladder cancer patients from healthy. There is no doubt that ucfDNA is a promising tool as a non-invasive biomarker in patients with urinary bladder cancer.

Mariam HASSAN

Ass. Prof. of Microbiology, College of Pharmacy, Cairo University, Egypt.

Mariam Hassan, Lecturer at the Department of Microbiology and Immunology, Faculty of Pharmacy, Cairo University. Dr. Mariam is the deputy director of the Biotechnology Center, Faculty of Pharmacy, Cairo University. She teaches microbiology, immunology, and bioinformatics courses to the undergraduate and postgraduate students. She earned her PhD in microbiology and immunology from Faculty of Pharmacy, Cairo University. She also earned a Fulbright scholarship to study public health at Ohio University. She was awarded the "TWAS/BVA.NXT" young scientist award in 2018. Her main research interests are environmental biotechnology, biodiversity, microbiome interactions, antimicrobials, animal models, bioinformatics and high throughput data analysis. She is also interested in knowledge transfer and scientific collaborations.

Lecture Title

"Orchestration between microalgae and wastewater microbiome in photo-bioreactors established for coking wastewater treatment"

Lecture Abstract

The investigation of microbial community structures is a significant way to understand biodegradation capacities in biological wastewater treatment processes. Photo-bioreactors A, B and C received real coking-wastewater as influent with COD 776 ±56, 1229 ±85 and 2033 ±27 mg/l, respectively. In phase-1 phenol was added to the influent, while dichlorophenol was added in combination with phenol in phase-2. Treatment efficiency of algal-bacterial systems was biomonitored using different bioassays (phytotoxicity, Artemia toxicity, cytotoxicity, algal-bacterial ratio and settleability). COD removal %, phenol and dichlorophenol concentrations were also monitored. All systems efficiently detoxified the influents in phase-1. In phase-2, Systems B and C failed to detoxify the influents. Illumina-sequencing generated 2119749 effective sequences of 16S-rRNA gene from 21 samples collected from different influents and effluents. The number of observed species was significantly lower in effluent samples than influent samples, as some taxa dominated in photo-bioreactors and contributed to the systems performance. Significant difference in the microbial diversity between influent and effluent samples was detected. Proteobacteria (78 %), Firmicutes (12 %), Bacteroidetes (5 %) and Deferribacteres (2 %) were the dominant phyla in influent samples. While in effluent samples Proteobacteria (68 %) and Bacteroidetes (25 %) dominated. Failure in treatment process in systems B and C at phase-2 was accompanied with significant difference in the microbial diversity. Significant relative abundance of anaerobic bacteria from Deferribacteraceae and Peptococcaceae families in influent samples conformed to the nature of coking-wastewater. The co-culture of microalgae shifted the microbiome and promoted the activity of genera affiliated to Chitinophagaceae, Pseudomonadaceae and Xanthomonadaceae families, which dominated in effluent samples. These bacteria are known for their catabolic diversity that enables xenobiotic degradation. The superiority of algal-bacterial systems for coking-wastewater treatment was confirmed as co-culture of microalgae eradicated pathogenic bacteria such as Arcobacter and Legionella genera in the treated effluent.

Mahmoud Wafik SADIK

Prof. of Microbiology, College of Agriculture, Cairo University, Egypt.

Prof. Dr. Mahmoud Wafik Sadik Professor of Environmental Microbiology, Department of Microbiology, Faculty of Agriculture, Cairo University. Currently, delegate as a Professor at Department of Environmental Biotechnology, College of Biotechnology, Misr University of Science and Technology. Head Manager of international laboratories accreditation unit ISO 17025/2017 and ISO 15189/2012 at Ministry of Higher Education. Received M.Sc. from Department of Environmental Sanitation, Faculty of Agriculture and Applied Biological Science, Gent University, Belgium in field of biodegradation and adsorption of Alkylphenol Ethoxylates using a patent consortium of microorganisms isolated from North Sea. Received Ph.D from Department of Microbiology, Faculty of Agriculture, Cairo University, Egypt in field of production of untraditional animal feeds from agricultural wastes using solid state fermentation.

Research is situated in field of Environmental Biotechnology with special focus on R&D in high biotechnology industries with focus on waste management, bioremediation, fermentations strategies and bionanotechnological applications. Innovations in date palm truck recycling into organic fertilizers and animal feeds in Saudi Arabia and production of microencapsulated bacteria for biodegradation of phenolic compounds in Egypt and wastewater treatment biotechnology. Teaching several courses on applied biotechnology for undergraduates and postgraduates. Author or coauthor has more than 30 international publications refereed journals (Scopus and Web of Science) and more than 20 conference contribution or speakers around the world.

Lecture Title

"Biosynthesis and Characterization of Silver Nanoparticles Produced by *Novel Strains of* Cyanobacteria"

Lecture Abstract

The world faces a challenge with the pervasion of multidrug-resistant bacteria that encouraged the scientists to develop and discover alternative ecofriendly and easy to produce new antibacterial agents. Our work is part of the greater effort of scientists around the world to achieve this goal by biological synthesis of silver nanoparticles using cyanobacterial extra- and intracellular components as a non-chemical reducing agent. Two Egyptian cyanobacteria were isolated and identified according to 16S rRNA gene sequencing as Phormidium ambiguum and a novel species Desertifilum tharense. The sequences were deposited with accession numbers MW762709 and MW762710 for Desertifilum tharense and Phormidium ambiguum, respectively in the GenBank. The results of UV-Vis analysis showed promising extracellular Ag-NPs synthesis by Desertifilum tharense and Phormidium ambiguum under light conditions. Therefore, these Ag-NPs were characterized and evaluated for antibacterial and antioxidant activity. TEM, and SEM analyses revealed the spherical crystals with face-centered cubic structures and size range of 6.24–11.4 nm and 6.46–12.2 nm for Ag-NPs of Desertifilum tharense and Phormidium ambiguum, respectively. XRD and EDX results confirmed the successful synthesis of Ag-NPs in their oxide form or chloride form. The FTIR spectrum data confirmed the presence of hydroxyl and amide groups. Desertifilum tharense Ag-NPs displayed the largest inhibition zone ranged from 9 mm against Micrococcus luteus ATCC 10240 to 25 mm against methicillin-resistant Staphylococcus aureus (MRSA) ATCC 43300. For Phormidium ambiguum Ag-NPs, the inhibition zone diameter was in a range of 9–18 mm. The biosynthesized AgNPs significantly inhibited the growth of medically important resistance-pathogenic Gram-positive and Gram-negative bacteria. The Ag-NPs of Phormidium ambiguum were exhibited the highest scavenging activity of 48.7% comparing with that of Desertifilum tharense that displayed 43.753%.

Moez ELSAADANY

Associate Professor of Biotechnology, College of Biotechnology, MUST, Egypt.
Reviewer for Food Chemistry Journal, Elsevier. CiteScore: 10.7, Impact factor: 7.5.
Editor for JOVE Journal of Visualized Experiments, PubMed.

Dr. Moez received his B.SC. in Agriculture Biotechnology from the University of Alexandria in 2012. He obtained his Master of Science, Technology and Health, from the department of Biology and Health science, University of Montpellier, France, in 2016, where he develops and study the mode of action of new inhibitory molecules of the nNOS-PIN complex for Antidiabetic targeting. In 2019, he achieved his Ph.D. in Food science and nutrition, Biotechnology and Microbiology, University of Montpellier, France. After the achievement of his master's degree, he was exciting to work in many other different fields of Biotechnology. He created an innovant project for his Ph.D. study. This project was focusing on the detection and quantification of mycotoxins in food by the development of Impedance Aptasensor based on Aptamer. At the final stage of his thesis, he succeeded to develop a new prototype of biosensor which can detect and quantify Ochratoxin A in green coffee instantly and directly in containers.

Also, he created a new analytic method to detect and purify this toxin using specific Aptamer assisted ultrafiltration coupled with HPLC-FLD with interested recovery percentage. His experience in research and academia over the past 9 years have provided him the opportunity to gain good knowledge and master several laboratory techniques in microbiology, food safety, cell culture, immunology, molecular biology, toxicology, and biosensor; including Impedance based measurements, Bio-functionalization, optimization, electrical measurements, confocal and fluorescence microscopy and many other techniques listed in his CV.

Lecture Title

"Detection of Ochratoxin A in food production using advanced Aptasensor"

Lecture Abstract

Mycotoxin contamination is a threat to the health and life of Humans and animals. One of the most common mycotoxins contaminating feed and foodstuffs is Ochratoxin A (OTA). OTA has a chronic toxic effect and has proved to be mutagenic and carcinogenic molecule. Aptamer with their specific affinity for OTA was used in this paper to create a new analytical technique. Several methods have been reported for the determination of OTA in foods. However, most of these methods could not be applied to a complex food because the interfering native fluorescent molecules made the quantification very difficult. In this work, we mixed two separations-based techniques to identify and quantify OTA in green coffee. Aptamer assisted ultrafiltration as separation technique was applied to separate the free OTA. The quantification of OTA was established by a high-performance liquid chromatography (HPLC-FD) with LOD of 0.05 ng/mL for OTA. Artificially contaminated green coffee displayed a good range of OTA recoveries up to 97.7%. A capacitive aptasensor was developed using this selected Aptamer for quantification of OTA based on modified anodized aluminum oxide with a LOD of 8*10-4 ng/mL. This method can be applied to the quantitative determination of OTA in green coffee at levels below the maximum levels proposed by the European Commission for green coffee (5 ng/mL To our knowledge, it is the first label-free and electric capacitive aptasensor used to detect the OTA

Roberto CIBOLDI

Technical specialist, Technopharmacy, Italy.

Roberto is a Technical Specialist, part of the Purification Team. Originally from Milan, Roberto joined us in 2013, he studied Chemistry at P. Carcano University and is currently studying Economy at Insubria University. He works on developing new process or supporting existing ones specifically on chromatography, depth filtration and tangential flow filtration, and previously was involved in our Validation Laboratories for two years. Roberto previously supported the Quality Assurance of a pharmaceutical company for two years during college study. In his spare time, he enjoys music events, skiing and playing basketball.

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