# Studying the Causes of Heat Emission and their Effect on Pathogens and How to Maintain Animal Productivity and Health

22nd of September 2022

**Egypt's Vision for Cop27: The Role of Animal Health in Egypt's National Climate Commitments**

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## (SESSION A)

**Prof. Magdy Ahmed Ghoneim**

Professor of Biochemistry and Molecular Biology, Faculty of Veterinary Medicine, Cairo University.

**Prof. Ahmed Osman Egiza**

Professor of Biotechnology, Egypt Japan University of Science and Technology (E-JUST).

**Prof. Hala Fawzy Eissa**

Dean of College of Biotechnology, Misr University for Science and Technology (MUST).

## (SESSION B)

**Prof. Magdy Ahmed Ghoneim**

Professor of Biochemistry and Molecular Biology, Faculty of Veterinary Medicine, Cairo University.

**Prof. Hanan Mohamed Refai**

Professor of Pharmaceutics, College of Pharmaceutical Sciences & Drug Manufacturing, MUST.

**Prof. Mahmoud Wafik Sadik**

Professor of Environmental Biotechnology, College of Biotechnology, MUST.

# Prof. Adel khalil Gohar

Dr. Adel is a professor of Clinical Pathology, Consultant of Biotechnology Laboratory. He is a director for Many Molecular Diagnosis Laboratory, Global Goodwill Ambassador, Vice editor-in-chief -Infectious Diseases Research journal, member in national committee of biotechnology and Genetic engineering. For 30 years, he is a clinical pathology specialist and molecular diagnosis of genetics and infectious diseases, in last 20 years, he has been responsible for a lab setting and the establishment of lab examinations using PCR, Real-Time PCR, Capillary sequencing, and recently, NGS sequencing in Gulf laboratories and Egypt. Moreover, he spent 18 years working in genetic testing and selection of embryos using PGD in the Egyptian IFV-ET canter, which had allowed him to analyze all pedigree data efficiently and identify the presence of any genetic problems to calculate risk involvement and to evaluate the pattern of inheritance. Additionally, he was head for the laboratory part of the AstraZeneca project in Egypt for testing and reporting EGFR mutations in FBPE & CF-DNA in 3000 lung cancer Egyptian patients. He established testing FGFR, KRAS & PDL1 in bladder cancer with Jhonson & Jhonson co. as well as testing BCR-APL in leukemia patients sponsored by Al-Hekma pharmaceutical Company. He handles Quality Control procedures for Colors medical lab for the last 3 years, Horizon for scientific consultancy for the last 3 years, and genetic lab in the Egyptian IVF-ET canter for the last 12 years performing tests on all genetic disorders and had been assisting all clients to interpret all specifications of genetic information and maintaining knowledge of all genetic information and providing social help. He has in-depth knowledge of QC for Self-monitoring checks on tasks done by Lab and knowledge of QC for computer applications. He routinely Collect and validate the results of the analyses, Make decisions (action and corrective actions) planning of trends shared by enhancing production elements and SOP development and SOP modification, and be as accurate in my QC as it comes.

# Global warming: impacts on animal health


## Abstract

Based on significant and accelerated climate changes and consequent deleterious effect on both animal health and animal economy. Animal affected by increase in greenhouse gases but they may play role in raising up Methane ($CH_4$) that has both human and natural sources, and levels have risen significantly raising livestock. Wildlife in Africa will be greatly damaged due to climatic changes where both wild dogs and elephant seriously at risk Mediterranean sea turtles need immediate inference. On changing geographic zones and move to new area that make changes in epidemiological disease frequency specially those insect borne diseases. Direct risk in Egyptian wildlife mainly coming to changes in wild migratory birds both time and destinations, risk of coral health and diminish area of coral in our sea shore risk of losing turtles in our sea water. Potential increase in cases of food poisoning as we as attention should be devoted to changes in vector-borne disease patterns in relation to climate change. For solving and make a plan expected national strategy for fighting against global warming in animals sector we have to focus on achieving sustainable animal we should targeted the following point with national controlled program aiming for **Reducing methane emissions** The most promising approach for reducing methane emissions from livestock is by improving the productivity and efficiency of livestock production, through better nutrition and genetics. **Genetic selection** based on species as Holstein Frisian more sustainable cows than other breeds so testing for genetic markers (STRs) should be highlighted for ensuring future efficiency of livestock production **Enhancing diet** many feed additive with special reference to those increase efficiency of unit production and raising up usage of low value diet. **Testing adapted animals for detecting celluolytic organisms** in rumen content will give power to make bank of isolates will be helpful **Disease control** with increasing power toward both diagnosis and vaccination specially those helminthes and snail host due to changes in ecosystem. Enhancing a regional and national reservation programs by FAO. OIE and other organization including both migratory birds, turtles and coral support by research and solving problems facing such animals.

# Prof. Ahmed Osman Mostafa Egiza

Dr. Ahmed is a professor of Biotechnology and Molecular Biology, Biotechnology Program, Institute of Basic and Applied Sciences (BAS Institute), Egypt-Japan University of Science and Technology (E-JUST). He was Chairman, Department of Biochemistry, and Dean for Post-Graduate Affairs and Research, Faculty of Science, Ain Shams University, Cairo, Egypt. He served on the editorial board of the Journal "Molecular and Biochemical Parasitology" The Netherland, and reviewer for grants submitted for the Science and Technology Development fund (STDF), the Academy of Scientific Research and Technology, EGYPT. He is a member of the Technical Committee for evaluation of reviewers' reports for proposals requesting STDF funding, since 2017. He served as an Associate editor of the Journal "Molecular Diagnosis and Vaccines". He is reviewer for the journal "Molecular and Biochemical Parasitology" , a reviewer for the Cooperative State Research, Education, Extension Service (CSREES), U.S. Department of Agriculture reviewer for the Egyptian Journal of Immunology, EGYPT, a reviewer for the Mansoura Journal of Biology, EGYPT, a reviewer for the "Immunological Investigations" and "Experimental Parasitology" journals , USA. He was an author of a chapter in "Parasite Genomics Protocols; Melville SE., Ed., Humana Press, 2004.

# Biodiversity; a consequence of climatic adaptation: A dissection of the interplay between genomes and Environmental shifts driven by climate change


## Abstract

The fast change in climatic conditions presents significant and serious problems threatening all kinds of life on the planet Earth. The ecological consequences of the climate change; fast temperature elevation, changes in precipitation patterns, deforestation, and desertification, undermine the biodiversity and increase the potential of causing ecosystem shift. Spread of vectors in a significantly varied latitudinal patterns, and the projected increase in vector-borne diseases are not the only risks that are attributed to climate change. Species diversification, in a given ecosystem, in response to climatic change results from deviation in transcriptomic, and to some extent genomic, norms, which is reflected on phenotypic plasticity as a consequence of genetic adaptation of the species, adds up to the environmental impacts of climate change.

Introgression of breeds as a driver for improving characteristics including adaptations to different agroclimatic conditions as well as persistence of individuals of different species in the local habitat reflect species tolerance to environmental shift. However, such adaptations are maintained by genetic diversity by introducing genomic changes that provide the basis for the introduced phenotypes. The interplay between these genetic modifications and the environmental factors constitutes the foundation of ecogenetics and climatic tolerance, which leads to species survival. On the other hand, some species that do not respond appropriately to biotic and abiotic stresses face demographic collapse and are subjected to the threat of extinction

# Prof. Hala Fawzy Eissa

Dr. Hala is Dean, College of Biotechnology, Misr University for Science and Technology Graduated from Faculty of Science (B.Sc. Biology), Mansura University (1990). M.Sc. (1997), Department of Genetics, Faculty of Agriculture, Ain Shams University. Ph.D. (2001), Department of Genetics, Faculty of Agriculture, Ain Shams University. Head of Research - Environmental Stress Laboratory Agricultural Genetic Engineering Research Institute, Agricultural Research Center - Ministry of Agriculture from 12-2016 to date Vice Dean for Education and Student Affairs, College of Biotechnology, Misr University for Science and Technology, 9/2011-8/2021. She received a post-doctoral scholarship from the Fulbright Mission at the University of Montana, USA She received the prize of the Arab Organization for Agricultural Development - the League of Arab States - for scientific creativity in 2003 in the field of using biotechnologies in the development of agricultural production. She won the Agricultural Research Center Incentive Award for Scientific Research 2008. She headed multiple research groups to carry out research projects in the field of plant genetic transformation and the discovery of genes related to plant tolerance to environmental stress. She supervised 20 students (Masters and Ph.D.) in different fields of genetics. Dr. Eissa has published more than 30 research articles. She worked as a reviewer for more than 50 scientific articles in many disciplines in many specialized scientific journals Participated in many international and local conferences and workshops. Participated as a trainer in many local and international training courses.

# Transgenic Animals: Pros and Cons


## Abstract

Animal breeding and animal biotechnology has been practiced since humans started socializing. A transgenic animal can be defined as an animal whose DNA has been altered by adding the desired gene from a suitable donor. This is achieved through the application of genetic engineering technology, which causes the desired gene to be expressed and inherited by the progeny. Transgenic animal biotechnology has found applications in a variety of fields. Transgenic animals are produced for improved quality breeding and increased product yield and to serve as model organisms for research into the mechanisms of many human diseases and potential remedies. Transgenic cattle and birds, for example, can be developed to produce more meat to meet growing food demand. Transgenic cattle can be engineered for improved milk production as well as the production of specific human proteins. On the other hand, Transgenic animals can be used as model organisms to investigate the processes of numerous human diseases. Once the genetic control of a disease is determined, model transgenic organisms are created by introducing the specific gene or by knocking out the gene, after which the model organism exhibits the same symptoms as seen in humans, and the genes can then be altered appropriately to find a cure for these diseases. The process of making a transgenic animal is time-consuming, labor-intensive, and costly, but the technology is cost-effective since once a transgenic animal is generated, it can breed and convey the cloned gene to its offspring. Even though there are numerous evident benefits to generating transgenic animals, individuals are apprehensive about using products derived from such animals or consuming these organisms. Transgenic animals have numerous applications for the human population, but they must be rigorously regulated.

# Prof. Nisreen Ezz El Dien

Dr. Nisreen ia a professor of Parasitology, Faculty of Veterinary Medicine, Cairo University. She was Head Deputy of the Disaster and Crisis Management Unit, Faculty of Veterinary Medicine, Cairo University, Head of the Training and Development Unit, Faculty of Veterinary Medicine, Cairo University and General Secretary of the Association of Egyptian Veterinary Medical Society of Parasitology. Now she is an advisor of Fayoum Governorate for Fisheries Affairs. She is a member of the Egyptian Society of Veterinary Parasitology, Egyptian Society of Parasitology, the Egyptian Vet. Med. Assoc., the zoological society A. R. Egypt, fish committee of the general organization for veterinary services, Egypt (G.O.Vet.S.), the fish committee for the solution of Lake Naser fish helminth problems in G.O. Vet. S. Egypt, Egyptian Society of Environment and Aquatic Animal Health, and the scientific advisory board of the Arab Federation for Sustainable Development and Environment. She is an editorial board member of Oceanography journal, Journal of Coastal Life Medicine, Journal of Oceanography and Marine Research, Journal of Aquaculture and Marine Biology, Egyptian Veterinary Medical Society of parasitology journal, and World Journal of Veterinary Science. She is a reviewer in Journal of Coastal Life Medicine, British Journal of Applied Science and Technology, Egyptian Veterinary Medical Society of Parasitology Journal, and Journal of Basic and Applied Zoology.

# Climate change and aquatic environments: Influences on fish- parasite interactions


## Abstract

Climate change is the complex and multidisciplinary change in global or regional climate patterns. Humans have been recognized as the major contributor to climate change, primarily through the use of fossil fuels like coal, oil and gas that emit greenhouse gases into the atmosphere such as Carbon dioxide (CO2), methane (CH4) and nitrous oxides (N2O). Over the next century, climate change-related factors are predicted to cause extreme temperatures, increased storm damage, sea-level rise, changing precipitation patterns, harmful algal blooms and more frequently occurring flooding with associated pollution. These factors are predicted to affect aquatic environments in many ways that may lead to ecosystem-level changes. Parasites are omnipresent components of biodiversity that not only affect host individuals, populations, and communities, but can also play an important role in ecosystem functioning and food-web dynamics. Parasitic organisms that exploit fish are also likely to be affected by climate change, directly through the ambient environment or indirectly via effects on host parameters, such as distribution, behavior, physiology, and mortality. It is possible that climate change will alter the prerequisites for parasite transfer, through changes in phenological relationships, and/or change the direction and pressure of selection in host–parasite relationships. The effects of climate change on fish–parasite systems have been reported as strong multifactorial because of the large number of interactions between different ecological and physiological factors, in addition to disturbances in aquatic habitats. For example, elevation in ambient temperature is predicted to enhance parasite metabolism, resulting in more rapid spread of parasites. On the other hand, the occurrence of some parasites could also decrease if temperature for growth and transmission is exceeded. In this presentation, we demonstrate a number of case studies to exemplify the multitude of possible impacts of climate change on fish–parasite systems. In particular, we present examples of the direct effects of temperature on the physiology, behavior, and phenological relationships of fish and parasites.

# Prof. Hanan Refai

Dr. Hanan Refai is a professor of Pharmaceutics, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology (MUST). She is the former Dean and Vice Dean for Postgraduate Studies and Scientific Research. She is also a former member of the Sector Committee of Pharmaceutical Studies. She received her bachelor's degree from the Faculty of Pharmacy, Cairo University in 1994. She obtained her master's degree from Martin-Luther University, Halle-Wittenberg, Germany, 1998 and earned her Ph.D. degree from Carolo-Wilhelmina University, Braunschweig, Germany in 2001. She contributed to the establishment of the pharmaceutics department at several private universities in Egypt. Prof. Hanan is a supervisor on many master's and Ph.D. theses and a peer reviewer at several international journals. Her current research area is the application of nanotechnology in the preparation of different pharmaceutical drug delivery systems that improve the bioavailability of drugs and prolong their effect on the human body. She was the secretary general of the International Conference of Pharmaceutical Sciences, MUST, 2018.

# Nanotechnology and Environmental Hazards

Abstract

Nanotechnology has played a key role as a result of its significant potential in various fields such as water treatment, agriculture, aerospace, and pharmaceutical industries. Available scientific data on nanomaterials have revealed their applications in consumer and industrial products in day-to-day life. Alternation in the surface properties of particles to minimize size up to nano-level may also be found to be responsible for their toxicity. Many governmental agencies raised inequity regarding the enlarged utilization of nanomaterials in many industries. Inhalation of nanoparticles through human beings is found to be less efficiently removed as compared to a large one (micro or macro particles) through biological clearance mechanisms in different body parts. However, nanoparticles easily transfer to various body organs through the circulatory systems which upsurges several diseases. Therefore, attention is needed to use nanoparticles in biological systems under control handling because of their toxicity.

# Asst. Prof. Ayah Badawi Abd El Salam Abozeed

Dr. Aya is an Assistant Professor of Food Hygiene and control (March 2019) Department of Food Hygiene and control (Milk and Dairy products Hygiene and Control), Faculty of Veterinary Medicine, Cairo University. Her fields of interest are Hygiene and control of milk and dairy product, Natural preservation of milk and dairy products, and Food safety management systems application. She is a member of Egyptian Society of Dairy Science, Egyptian Veterinary Medical Association, Egyptian Veterinary Association for Food Control and Consumer Protection, Egyptian Association for Food industry and Nutrition, Egyptian Society for Reproduction and Fertility, and Member in Veterinary Medicine Cairo University Institutional Animal Care and Use Committee, Vet. CU. IACUC.

# Climate change and food Safety: risks and responses


## Abstract

Climate change can affect **food production** through the effect of raised temperature, changes in precipitation, extreme weather events, sea level rise and loss or degradation of agricultural land. Long-term changes in temperature, humidity, rainfall patterns and the frequency of extreme weather events are already affecting farming practices, crop production and the nutritional quality of food crops. Climate change several factors can have an impact on food production, processing, storage, and distribution till consumption. In other words, climate change affects the 4 dimensions of food security: availability, stability, access and utilization. Food can be contaminated with micro-organisms, disease pathogens, and fungal toxins, toxic products of harmful algae, chemicals, pesticides and veterinary drugs. Environmental factors can affect abundance of pathogens, their survival and/or their virulence. The sensitivity of germs, potentially toxin-producing microorganisms and other pests to climate factors suggests that climate change has the potential of affecting the occurrence and intensity of some foodborne diseases. Climate change and variability can provoke changes in the nature and occurrence of **food safety hazards**. These hazards can arise at various stages of the food chain, from primary production to consumption, and climate change may have direct and indirect impacts on their occurrence. It will also encourage infection of crops with toxigenic fungi and the production of **mycotoxins**, which will reach man through ingestion of infected crops. Through its effect on marine environment climate change will enhance the formation of harmful algal blooms and the formation of algal toxins with consequent occurrence of **sea-food borne intoxications**. Due to the increased use of chemicals, pesticides and veterinary drugs to deal with plant pests and animal diseases, **residues** of these substances can be present in food in toxic amounts.

Ensuring food safety at every step from farm to fork means those farmers, producers, and the agri-food sector as a whole need to prepare for and respond to threats throughout the supply chain. And this work is now more complicated with the changing climate, which can make food unsafe in myriad ways. An international team of scientists led by EFSA have developed a methodology to identify and define emerging risks for food and feed safety, plant and animal health and nutritional quality related to climate change. The approach – called CLEFSA “Climate change as a driver of emerging risks for food and feed safety, plant, animal health and nutritional quality”.

# Prof. Mahmoud Wafik Ahmed Mohamed Sadik

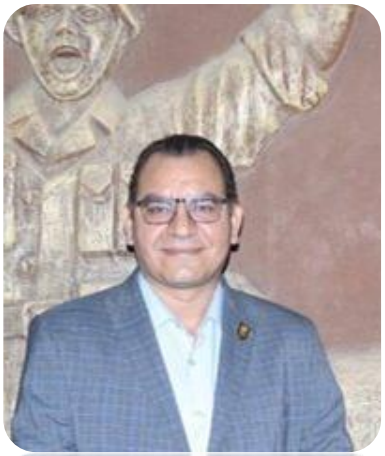
Dr. Mahmoud Wafik Sadik Professor of Environmental Microbiology, Department of Microbiology, Faculty of Agriculture, Cairo University. Currently delegated as a Professor at Department of Environmental Biotechnology, College of Biotechnology, Misr University of Science and Technology, received M.Sc from 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 microorganism 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 main focus on waste management, bioremediation strategies and bionanotechnolgy applications. Innovation awarded 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.

# Applications of Advanced Biotechnology in Mitigating Climate Changes through Improving Quantity and Quality of Feed Resources.


## Abstract

Climate change influences bovine production directly and indirectly through its effect on reducing the quality and quantity of feed resources, and increasing spatial and temporal distribution of infectious diseases. The advances of biotechnology now a day's opened an event to apply different biotechnology approaches to improve the nutritive value and digestibility of fibrous feeds by using specific nonpathogenic fungal and bacterial strains such as white rot fungi and cellulolytic bacteria through solid state fermentation technique. Moreover, supplementation of green biosynthesized nanoparticles, probiotics, enzymes and organic acids modulate the activities and composition of the rumen microbial ecosystem ,thereby reduce lactic acid content, improve nutrient digestibility, reduce methanogenesis, optimize voluntary fatty acid profiles, and decrease ruminal ammonia production and protein degradation. All these effects increase productive performances and reduce methane emission from bovine's production and control infectious diseases such as bovine mastitis. Therefore, implementation of biotechnological tools in animal production in developing countries is very important to increase production and productivity, and realize the potential use of biotechnology for climate change adaptation and mitigation.

# Asst. Prof. Abdelbary Prince



Dr. Abdelbary Prince was born in Cairo, Egypt. He received the Master's and Ph.D. degrees in Biochemistry and Molecular Biology (BMB). Dr. Prince did his Master's and Doctorate research in the laboratory of Dr. Han at Inje University, South Korea and his post-doctoral work as a Mass Spec Specialist in the laboratory of Dr. Cregan at USDA. In 2003, he joined the Department of Biochemistry and Molecular Biology, Faculty of Veterinary Medicine, Cairo University, as a teaching assistant, and in 2018 became Associate Professor of Biochemistry and Molecular Biology at Cairo University. His current research interests include Stem cells research, Proteomics, Mitochondrial Research, Gene therapy and Molecular diagnostics. Dr. Prince is a Fellow of the United States Department of Agriculture, MD, USA; Institute of pharmaco and Toxicogenomics, MHH, Hannover, Germany; National Laboratory of Mitochondrial Signaling, College of medicine, Busan, South Korea. Dr. Prince is the consultant of Veterinary Hospital of Armed Forces of Egypt. While teaching 15 contact hours a semester, advising students and being involved throughout Cairo University campus, he has maintained a successful research. For the past 5 years, Abdelbary was worked in the Laboratory of Molecular Epidemiology to focus on genotyping of Avian Influenza isolated from Egyptian farms. He has participated in organization of many workshops and conferences in the field of Genomics and Proteomics as lecturer and organizer.

# Effects of Climate Change on Marine Organisms: A Proteomic Approach


## Abstract

The effects of climate change, namely sea warming and ocean acidification, cause changes in the physiology, phenology, and biogeographical distribution of organisms. The stress induced in marine organisms at the proteome level, altering the expression of proteins and their modifications, is still largely unknown. The most common techniques used in marine proteomics regarding climate change are 2D electrophoresis and protein identification by mass spectrometry. Typically, the workflow includes several sequential steps: (1) sample preparation, (2) protein denaturation and reduction, (3) protein (peptide) separation, enzymatic digestion, and mass spectrometry analysis, and (4) bioinformatics and protein identification. As such the “omics”, and particularly proteomics, have the potential to provide new insights into the integrative functional responses of organisms to environmental stresses. Studies developed to date on proteome changes suggest a convergence toward a common set of stress-induced proteins related to metabolism, the cytoskeleton, chaperones, and diverse protective proteins. Therefore, this lecture discusses the main aspects related to climate change that affect marine organisms, with a special emphasis on the typical proteomic workflow used for marine organisms, the most relevant studies, the main problems, and future challenges.