



MEDNIGHT

The 11 members of the  
Mediterranean Science Team



# Abla Mehio Sibai

## A LONG LIFE FOR ALL

Professor of Epidemiology, Faculty of Health Sciences, American University of Beirut (AUB) World Health Organization (WHO), Member of the Science Council (since 2021)

In a region where population ageing coincides with chronic political instabilities and economic turmoil, prospects for older Arab men and women to remain active and preserve quality of life as long as possible, is even more challenging.

Professor Abla Mehio Sibai is addressing these questions through interdisciplinary, collaborative research that aims to advance our understanding of the burden of non-communicable diseases (NCDs) among older adults in underprivileged and post-war communities.

She also seeks to influence a shift in the way we view elderly people's right to enjoy a meaningful, fulfilling life. Through her globally recognised work, she has built an international reputation in the field of gerontology and the epidemiology of NCDs, including cardiovascular disease, cancer, diabetes and wellbeing across the life course.



## Katerina Harvati

### GREECE AT THE HEART OF *HOMO SAPIENS*

Prof. Harvati is a paleoanthropologist specializing in Neanderthal paleobiology, modern human origins and the application of 3-D geometric morphometric and virtual anthropology methods to paleoanthropology.

Her broader research interests include primate and human evolution; evolutionary theory; the relationship between the phenotype, genetics, behavior and the environment; and the paleoanthropology of South-East Europe. She has conducted fieldwork in Europe and Africa, most recently in Greece.

Her work on the Apidima human fossils from Greece was listed among the most important scientific discoveries of the decade.

Homo sapiens evolved in multiple places in Africa, and a few thousand left some 70,000 years ago to populate the rest of the world. But now we know that there were earlier diasporas from the motherland. This year, we discovered that we had made it all the way to Greece. Embedded in the roof of a cave in the southern Peloponnese, two crushed skulls were found by Katerina Harvati and her team, one a sprightly 170,000-year-old Neanderthal, but the other is us, Homo sapiens, and is more than 210,000 years old. This is far older and much farther afield than we had previously found. The revolution in the story of how we got here shows no signs of calming down.



## Martina Pierdomenico

### THE LARGEST DUNGHILL IN THE MEDITERRANEAN

Martina is part of La Sapienza's new program in Marine Science that aims to form a new generation of experts and scientists with a broad background in the different disciplines that comprise marine sciences: oceanography, marine geology, marine biology, ocean exploration and ocean chemistry. For this reason, Martina will be part of a joint project between MMRI, La Sapienza University and NOAA Northeast Fisheries, that involves the study of the Hudson Canyon Head morphology (using high resolution Sonar Data) to target and confirm the existence of deep water corals and sponges in the canyon.

The Italian CNR researcher has developed technology that can track and find waste deposits at the bottom of the oceans. She found the largest dunghill in the Mediterranean. She found the largest concentration of rubbish ever recorded in deep waters anywhere in the world. The study was published in Scientific Reports. The dump is at the bottom of the Strait of Messina, which separates the island of Sicily from the Calabria region of mainland Italy. If the maximum accumulation of rubbish found in this area - 13 objects in a straight 10-metre line - is extrapolated to an area of one square kilometre, it would be "1,000 times greater than that observed in any underwater canyon in the world," the study notes.



## Habiba Bouhamed Chaabouni

### WHEN TRADITIONS ARE AT RISK

Habiba Bouhamed Chaabouni is professor of medical genetics at Tunis University.

In 1981, Chaabouni created the first genetic counselling service, then launched epidemiological studies on consanguinity in northern Tunisia a region where the rate of genetic illnesses, of birth defects and of mortality was particularly elevated. Her studies demonstrated that in this region, a quarter of the marriages involved first cousins whose parents were themselves siblings.

In 1993, she put in place a medical genetics service and consulting practise with the goal of influencing people to request prenatal diagnosis testing. Her work enabled the identification of new genetic mutations involved with different pathologies. She has published over 100 research articles and is author or co-author of 50 peer-reviewed articles.

At the same time, she created a graduate program in genetics at the Faculty of Medicine at Tunis University.

She has been a consultant for the World Health Organization (WHO), and the League of Arab Nations.



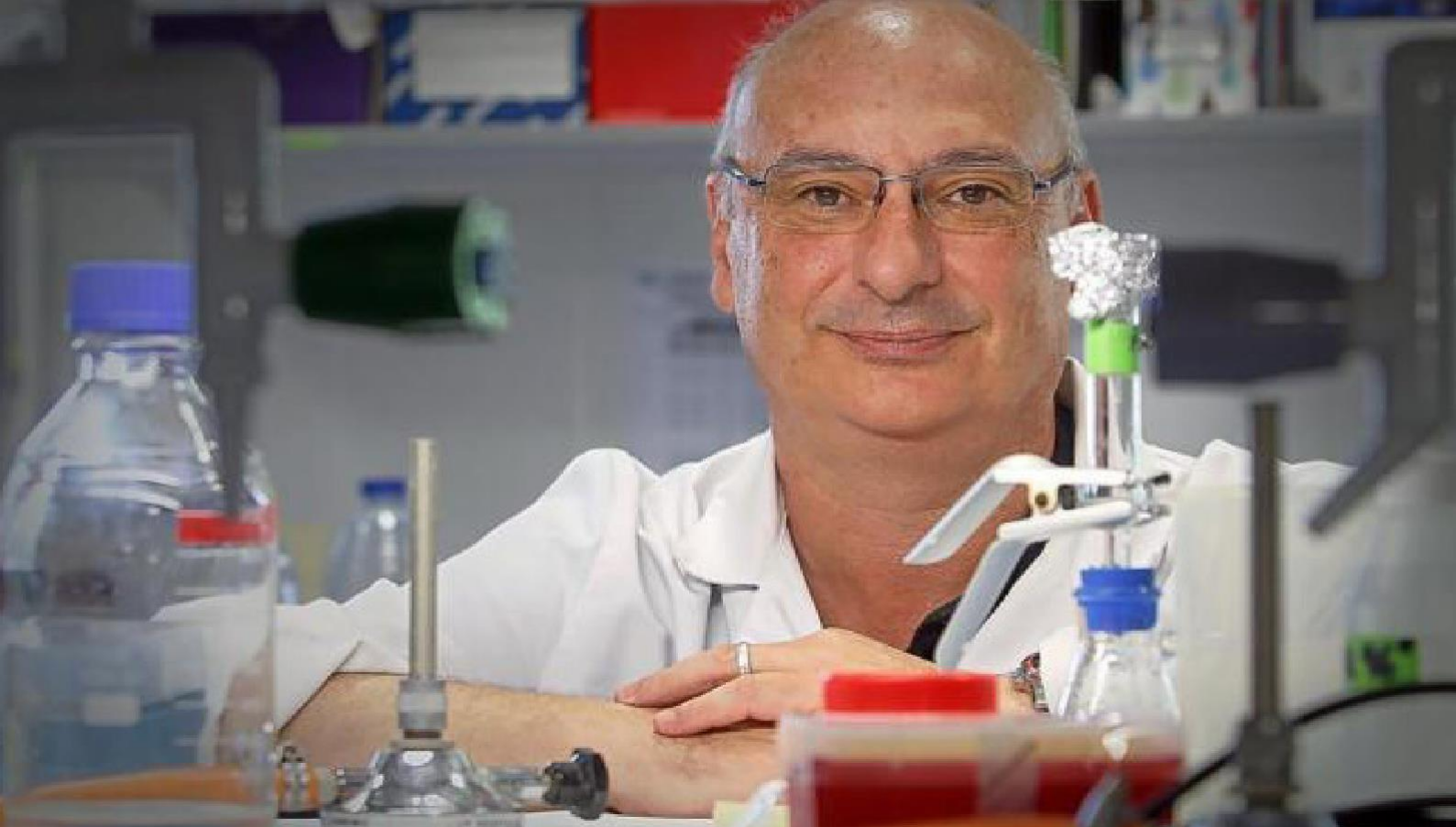
## Alain Aspect

### THE PHYSICIST WHOM THE PHILOSOPHERS LOVE

The physicist who successfully demonstrated quantum entanglement, a defining moment in modern physics.

Professor Alain Aspect from Institut d'Optique in France is internationally recognized for performing a series of experiments in 1982 that demonstrated that one of the strangest predictions of quantum mechanics—quantum entanglement—was true. This discovery sparked the second quantum revolution and directly led to the birth of quantum information processing.

He surprises physicists and philosophers alike. He is currently involved in Atos, a major player in France's national strategy on quantum technologies.



## Francisco Martínez Mojica

ALMOST A NOBEL PRIZE WINNER

Prof Francisco Juan Martínez Mojica is best known for his ground-breaking discovery of CRISPR/Cas9 genome editing techniques that have triggered a revolution in biology. His fundamental work on CRISPR for more than two decades has been awarded with the Jaime I Prize in Basic Research, the Lilly Foundation Prize for Preclinical Biomedical Research, the PLuS Alliance Prize for Global Innovation and the Albany Medical Center Prize in Medicine and Biomedical Research, among other recognitions.

Jennifer Doudna, Emmanuelle Charpentier and Feng Zhang, co-inventors of CRISPR/Cas9, are today the faces everyone associates with the gene editing tool. But the one who discovered the mechanism at the core of the tool and who gave CRISPR its name is Francis Mojica, a Professor at the University of Alicante, Spain.

He is Associate Professor of Microbiology at the Department of Physiology, Genetics and Microbiology at the University of Alicante, Spain. He graduated in Biology from the University of Valencia and earned his PhD in biology for research on the response of halophilic microorganisms to stress factors.



## Avelino Corma Canós

### CHEMISTRY TO SAVE THE WORLD

Corma is a research professor at the CSIC and works at the ITQ. With an h-index of 136, his CV includes more than 1,250 publications, 150 patents -10 of them in industrial exploitation-, and 30 doctoral theses supervised.

His current field of research focuses on the development of catalysts for fine chemical intermediates, molecules and products for the pharmaceutical, perfume and food industries. At the same time, he is also working on the transformation of biomass into energy.





## Guillermina López-Bendito

### THE BRAIN BEFORE BIRTH

Guillermina López-Bendito is a researcher at the Instituto de Neurociencias de Alicante (UMH-CSIC), who investigates the development of the brain structure and connections that allow us to see, hear and feel what we touch.

With her work, she has discovered that the area of the cerebral cortex that processes information from the mice's whiskers, equivalent to our sense of touch, increases 15% to compensate for lack of vision. As the researcher López Bendito explained, "this is what's relevant because it is not due to experience, as up to 15 days after birth, normal mice still have their eyes and ears closed. And it means that the brain detects that the retina is not working and sets off the necessary changes to compensate for lack of vision before birth, when the eyes are not yet operative. And the structure that measures these adaptations is precisely the thalamus." The aim of this line of research for Guillermina López's group is to find a way of restoring damaged sensory circuits. To do this, they work on reprogramming a type of cell from the brain, known as astrocytes, that they hope to convert into neurones to restore affected senses



## Iris Charalambidou and Salih Gucel

### THE IMPORTANCE OF CYPRUS ON THE BIODIVERSITY MAP

The coming together of these researchers shows how science is above conflict. They have studied a place in Cyprus ravaged by war, discovering its value for the planet's biodiversity.

Iris Charalambidou and Turkish Cypriot Salih Gucel, both biologists by training, led a pioneering study in 2007 that explored the flourishing flora and fauna within the buffer zone.

Among the survey's findings were that some areas within the no-man's land were important for birds that use Cyprus as a stopover during spring and autumn migration, such as vultures, ospreys and harriers, as well as the northern lapwing, whose numbers in Europe had declined. Located in the remote northeast of the island, Varisia offered scientists a deeper understanding of the dynamics of nature in a previously inhabited area.

Abandoned in the wake of a 1974 Turkish invasion, empty houses are a silent witness to the conflict.



## Nagwa Abdel Meguid

### UNTANGLING MENTAL ILLNESS

Nagwa Abdel Meguid is an Egyptian geneticist. Her research has identified several genetic mutations that cause common syndromes such as the fragile X syndrome and Autism.

Meguid has a Ph.D. in Human Genetics. Nagwa Abdel Meguid's research interests include clinical genetics, neurodevelopmental disorders, human DNA technology, and dysmorphology.

A professor Human Genetics, Nagwa Abdel Meguid's name has resonated wide and large across Egypt and the international community of genetic researchers.

She particularly focuses on genetic mutations, namely trisomy, down syndrome, autism, neurodevelopment, mental health and disorders stemming from inter-family relationships. She also specializes in the early intervention treatment of children with genetic disorders and has successfully identified several novel genetic syndromes.

Dr. Meguid's research is leading to earlier, more definitive diagnosis of various genetic disorders along with better, more specialized treatment for patients. Her work is changing the entire practice of neurology, heightening our understanding of neurological and genetic disorders. Perhaps some day, because of people like her, many genetic disorders might be a thing of the past.



## Nurcan Tunçbağ

### ALGORITHMS AND PROTEINS

Nurcan Tunçbağ is a Professor of Health Informatics at the Middle East Technical University. She works on computational models of complex biological systems.

Tunçbağ studied chemical engineering at Istanbul Technical University. She joined Koç University for her graduate studies, earning a master's degree in computational science and engineering in 2007. She remained there for her doctoral studies, studying protein interactions and their incorporation into protein interaction networks.

Tunçbağ works on computational models of complex biological systems. She was in the developer team of the PRISM (protein interactions by structural matching) algorithm that can be used to predict protein–protein interactions and assembly. The algorithm can be used to identify 'hot spot' protein binding regions, which can be used to target drugs.

She can incorporate pharmaceutical and biological agents into her algorithm to help inform future therapeutics.

Tunçbağ looks to identify how the genome is altered during disease. One of the diseases considered by Tunçbağ is Glioblastoma, a particularly malignant brain tumour. Tunçbağ developed a network model that can be used to identify tumour pathway-level changes.

She has also worked on neurodegenerative diseases including Parkinson's disease. She was made an Associate Professor in 2017.