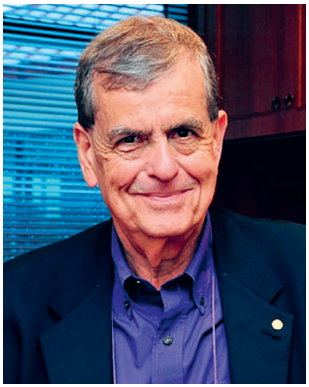
ISABS 2024
ABOUT NOBEL LAUREATES



Aaron Ciechanover, M.D., Ph.D., was born in Haifa, Israel in 1947. He is currently a Distinguished Research Professor in the Faculty of medicine at the Technion – Israel Institute of Technology in Haifa, Israel. He received his M.Sc. (1971) and M.D. (1973) from the Hebrew University in Jerusalem. He then completed his national service (1973-1976) as military physician and continued his studies to obtain a doctorate in biological sciences in the Faculty of Medicine in the Technion (D.Sc.; 1982). There, as a graduate student with Dr. Avram Hershko and in collaboration with Dr. Irwin A. Rose from the Fox Chase Cancer Center in Philadelphia, USA, they discovered that covalent attachment of ubiquitin to a target protein signals it for degradation. They deciphered the mechanism of conjugation, described the general proteolytic functions of the system, and proposed a model according to which this modification serves as a recognition signal for a specific downstream protease. As a post- doctoral fellow with Dr. Harvey Lodish at the M.I.T., he continued his studies on the ubiquitin system and made additional important discoveries. Along the years it has become clear that ubiquitin-mediated proteolysis plays major roles in numerous cellular processes, and aberrations in the system underlie the pathogenetic mechanisms of many diseases, among them certain malignancies and neurodegenerative disorders. Consequently, the system has become an important platform for drug development. Among the numerous prizes Ciechanover received are the 2000 Albert Lasker Award, the 2002 EMET Prize, the 2003 Israel Prize, and the 2004 Nobel Prize (Chemistry; shared with Drs. Hershko and Rose). Among many academies, Ciechanover is member of the Israeli National Academy of Sciences and Humanities, The European Molecular Biology Organization (EMBO), the American Academy of Arts and Sciences (Foreign Fellow), the American Philosophical Society, the National Academies of Sciences (NAS) and Medicine (NAM) of the USA (Foreign Associate), the Pontifical Academy of Sciences at the Vatican, the Chinese Academy of Sciences (CAS; Foreign Member), the Russian Academy of Sciences (Foreign Member), and the German Academy of Sciences (Leopoldina).

Richard J. Roberts, Ph.D., is the Chief Scientific Officer at New England Biolabs. He was educated in England, attending St. Stephen's School and the City of Bath Boys' School in Bath before moving to the University of Sheffield where he obtained a B.Sc. in Chemistry in 1965 and a Ph.D. in Organic Chemistry in 1968. His postdoctoral research was carried out in Professor J.L. Strominger's laboratory at Harvard, where he studied the tRNAs that are involved in the biosynthesis of bacterial cell walls. From 1972 to 1992, he worked at Cold Spring Harbor Laboratory, reaching the position of Assistant Director for Research under Dr. J.D. Watson. He began work on the newly discovered Type II restriction enzymes in 1972 and in the next few years more than 100 such enzymes were discovered and characterized in Dr. Roberts' laboratory. His laboratory has cloned the genes for several restriction enzymes and their cognate methylases and studies of these enzymes have been a major research theme. Dr. Roberts has also been involved in studies of Adenovirus-2 beginning with studies of transcription that led to the discovery of split genes and mRNA splicing in 1977. This was followed by efforts to deduce the DNA sequence of the Adenovirus-2 genome and a complete sequence of 35,937 nucleotides was obtained. This latter project required the extensive use of computer methods, both for the assembly of the sequence and its subsequent analysis. His laboratory pioneered the application of computers in this area and the further development of computer methods of protein and nucleic acid sequence analysis continues to be a major research focus. The field of DNA methyltransferases is also an area of active research interest and crystal structures for the *Hha*I methyltransferase both alone and in complex with DNA have been obtained in collaboration with Dr. X. Cheng. The latter complex is quite remarkable as the protein causes the target cytosine base to flip completely out of the helix so that it is accessible for chemical reaction. This extreme, but elegant, distortion of the double helix had not been seen previously. A major interest at present is the semi-automatic identification of restriction enzyme and methylase genes within the GenBank database and the development of rapid methods to assay function. Already several new specificities have been found and there are many more restriction enzyme genes in Nature than had been previously suspected. Most recently, Sir Roberts is one of the leaders of the COMBREX project that is concerned with the functional annotation of prokaryotic genomes.

Svante Pääbo, Ph.D., has developed techniques that allow DNA sequences from archaeological and paleontological remains to be determined. His research group has determined high quality genome sequences from Neanderthals and discovered Denisovans, a previously unknown hominin group in Asia. They have shown that both Neanderthals and Denisovans contributed DNA to present-day humans and that these contributions have physiological and medical consequences today. Professor Pääbo is a Director at the Max-Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and an Adjunct Professor at the Okinawa Institute of Science and Technology, Japan.

Gregg L. Semenza M.D., Ph.D., received his B.S. degree in genetics from Harvard University and the M.D. and Ph.D. degrees from the University of Pennsylvania. He completed an internship and a residency in pediatrics at Duke University, and postdoctoral studies in medical genetics at Johns Hopkins University. He joined the Johns Hopkins faculty where he established his own laboratory. He later served as director of the Vascular Program at the Johns Hopkins Institute for Cell Engineering. Dr. Semenza is known for his investigations of how cells use and regulate oxygen and for his discovery of hypoxia-inducible factor (HIF), a molecule that is activated by reduced oxygen availability in cells and that plays a critical role in enabling cells to survive in certain disease states. Semenza's research opened a door for the investigation and development of novel treatments for diseases such as cancer and ischemic cardiovascular disease, in which reduced oxygen availability is a major feature of disease. Dr. Semenza was recognized for his work with multiple awards throughout his career. He shared the 2010 Canada Gairdner International Award and the 2016 Albert Lasker Basic Medical Research Award with the American William G. Kaelin, Jr., and the British Sir Peter J. Ratcliffe. He is a member of the National Academy of Sciences and the National Academy of Medicine. For his discoveries he was awarded the 2019 Nobel Prize for Physiology or Medicine (shared with Kaelin and Ratcliffe).