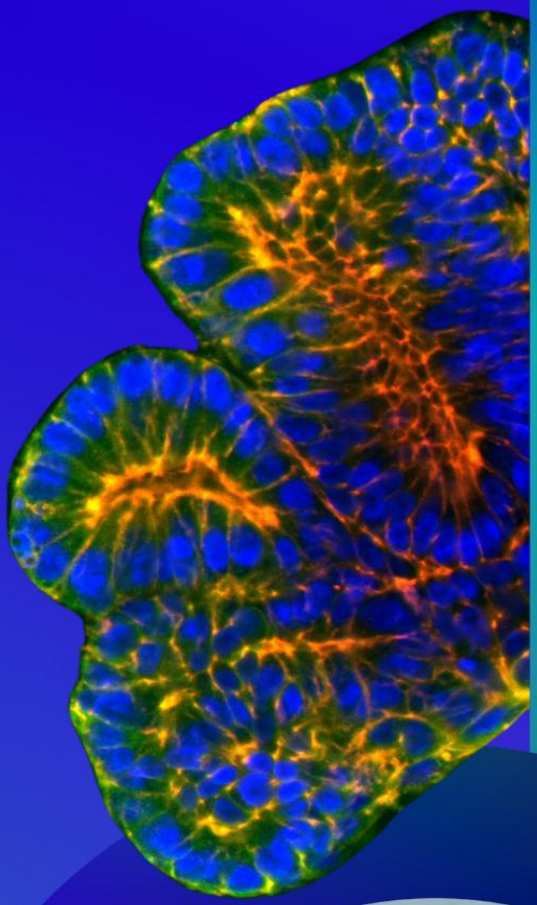
Faculty of Medical
& Health Sciences
Tel Aviv University



HEALTH AND MEDICAL SCIENCES

TEL AVIV UNIVERSITY

Gray Faculty of Medical & Health Sciences
Tel Aviv University

Our Faculty

Our broad areas of research encompass cancer and molecular therapies, neuroscience research and brain disorders, dental health and medicine, metabolic and endocrine diseases, genetic diseases, genomics and precision medicine, artificial intelligence and machine learning, hearing, language and speech sciences and disorders, infectious diseases, inflammatory and autoimmune diseases, medical education and ethics, nursing, occupational and physical therapy, public health, development and evolution, stem cells, regenerative medicine and aging.

Basic and translational research

As the largest medical and health sciences faculty in Israel, our **research and teaching** cover the full spectrum of cutting-edge health and biomedical sciences.

Our **diverse educational and training programs** are delivered by academic staff who are experts in their fields, offering PhD, MSc, MD, DMD, and MPH degrees in medical sciences, clinical medicine, dental medicine, communication disorders, nursing, occupational therapy, physical therapy and public health.

For more information please visit

https://en-med.tau.ac.il/

Gray Faculty of Medical & Health Sciences - Contents

Vision

Prof. Karen B. Avraham
Dean

We believe that bringing together the best and brightest minds –faculty, research associates, post-doctoral fellows and graduate students at the Faculty will expedite medical breakthroughs.

Our **Preclinical Faculty members** performing basic and translational research on the Tel Aviv University campus, along with our **Clinical Faculty members** at the 18 affiliated medical centers, hospitals and HMOs in the greater Tel Aviv area, are the key to our success to translate our research into effective cures and treatments.

The Faculty by numbers

110	**Preclinical Faculty members** with labs on the Tel Aviv University Ramat Aviv campus and 14 with labs at the affiliated hospitals
1200	**Clinical Faculty members,** with labs at the 18 affiliated medical centers, hospitals and HMOs in the greater Tel Aviv area
1050	**Graduate students** performing research on campus and hospitals
1250	**Medical students** in the Four, Six and American medical school programs
360	**Dental students**
1720	**Undergraduate students** in Health Professions and Combined Medical and Life Sciences Program
600	**MPH students** in Public Health

Dean's Committee

Prof. Karen Avraham, PhD
Dean

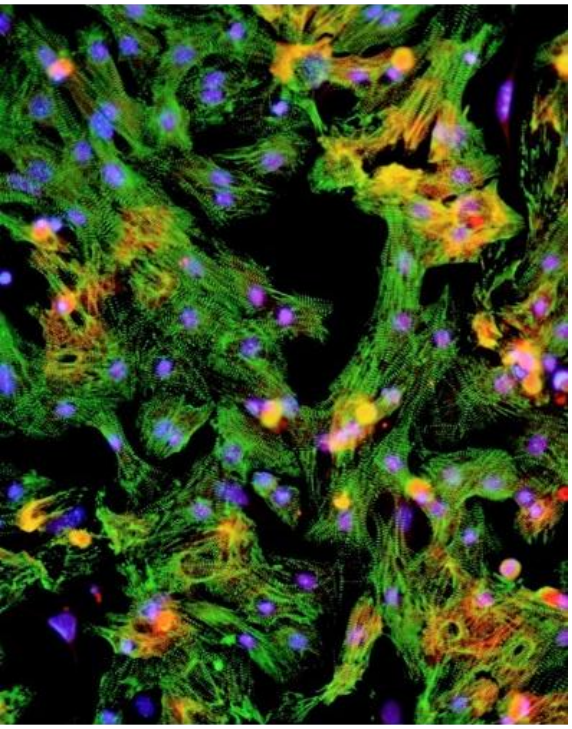
Prof. Rina Rosin-Arbesfeld, PhD
PhD, Vice Dean for Preclinical Affairs

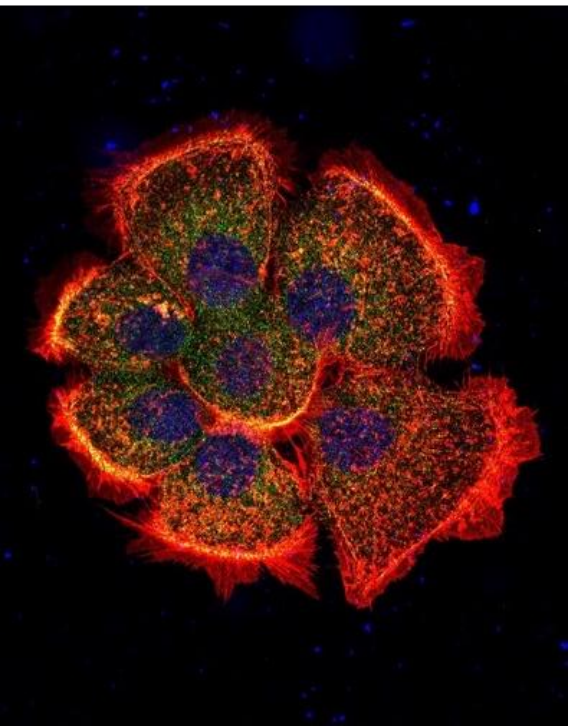
Prof .Yariv Yogev, MD
Vice Dean for Clinical Affairs

Prof. Anat Gafter-Gvili, MD
Vice Dean for Clinical Teaching Excellence & Mentoring

Prof. Ronen Zaidel-Bar, PhD
Vice Dean for Preclinical Research Innovation & Development

Prof. Benjamin Dekel, MD-PhD
Vice Dean for Clinical Research Innovation & Development





Our areas of study

Understanding and conquering human disease remains one of the most important missions of humanity. Despite centuries of continuous progress, we still lack basic knowledge about the human body in health and disease. From genetics and biochemistry to epidemiology and public health, from virology to immunology, and from diabetes to cancer - at the Gray Faculty of Medical & Health Sciences we apply our basic curiosity of the secrets of life to questions that actually matter. We strive to improve patient care by bettering our understanding of human disease. Join us in this important and fascinating journey.

+ **Anthropology and Ancient DNA**
+ **Cancer and Molecular Therapies**
+ **Cardiovascular Research and Diseases**
+ **Computational Biomedical Research**
+ **Development, Aging, and Regenerative Medicine**
+ **Diabetes, Metabolic and Endocrine Diseases**
+ **Ethics, Biomedicine and Policy**
+ **Genomics and Precision Medicine**
+ **Infectious and Inflammatory Diseases**
+ **Medical Education, Ethics and History**
+ **Molecular Targeting and Drug Discovery**
+ **Nervous System and Brain Disorders**
+ **Public Health**
+ **Rehabilitation**
+ **Technology and AI in Healthcare**

Credits :
Left –Primary mouse keratinocyte stained with phalloidin (red), striatin (green), and Dapi (blue). Yarden Shor, Michal Caspi, Rina Rosin-Arbesfeld .
Middle - Induction of heart cell growth. OPN activates signals (yellow) that enter the heart cell (green) nuclei (blue). Itai Rotem, Jonathan Leor .
Right - C. elegans germline expressing a membrane marker. Yusuke Hara, Ronen Zaidel-Bar .

Gray Faculty of Medical & Health Sciences
Tel Aviv University

Centers, Institutes and Hubs

Prof. Yftach Gepner at the Sylvan Adams Sports Institute

+ Aufzien Family Center for the Prevention & Treatment of Parkinson's Disease
+ Felsenstein Medical Research Center
+ Goldschleger Eye Research Institute
+ Sylvan Adams Sports Institute
+ Neufeld Cardiac Research Institute
+ Yoran Institute for Human Genome Research
+ Sagol Center for Regenerative Medicine
+ Gertner Institute of Nanomedicine
+ Stanley Steyer Institute for Cancer Epidemiology and Research

Affiliated Centers

+ Blavatnik Center for Drug Discovery
+ Center for Nanoscience and Nanotechnology
+ Edmond J. Safra Center for Bioinformatics
+ Center for Artificial Intelligence & Data Science (TAD)
+ Healthy Longevity Research Center
+ Cancer Biology Research Center

Source: Healthy Longevity Research Center

Anthropology and ancient DNA

Affiliations

- Dan David Center for Human Evolution and Biohistory Research
- Shmunis Family Anthropology Institute (SFAI)

Neanderthal skull from Amud cave 50,000 years ago.

Young anthropologist in action: Emma Blatt excavating at Manot Cave (photo with permission).

The Dan David Center is dedicated to investigating human evolution, employing cutting-edge technologies and relying on the thousands of fossil specimens housed at the Biological Anthropology Collection. This collection includes remains spanning over 1 million years of human history and is one of the world's largest anthropological collections.

The Center includes the Shmunis Family Anthropology Institute and an Ancient DNA laboratory. The Institute houses a high-resolution micro-CT scanner, which enables scholars to extract hidden information from fossils on a multitude of aspects of past human behavior, nutrition, and health. Images are stored in a database, forming the Shmunis Digital Library, a web-based resource accessible to scholars worldwide. The Ancient DNA laboratory features a state-of-the-art clean room and a sequencing facility, enabling us to recover genetic information from ancient remains. Ancient DNA data allow us to explore past population history, ancestry, kinship, and social structures, as well as to study the evolution of the human genome.

The Center is managed by Prof. Hila May, a biological anthropologist, and includes Prof. Rachel Sarig, a dental anthropologist, Prof. Israel Hershkovitz, a biological anthropologist, and Dr. Viviane Slon, a paleo-geneticist.

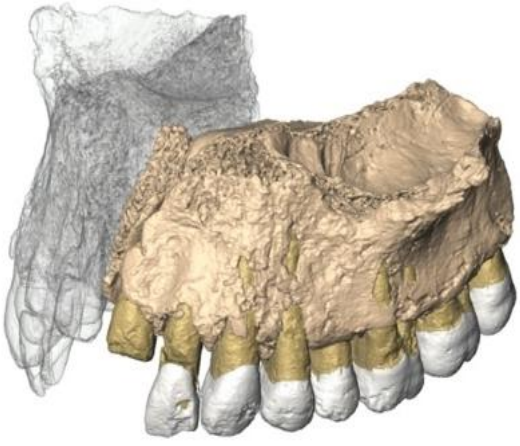
Prof. Hershkovitz, PhD, is a Professor Emeritus in the Department of Anatomy and Anthropology of the Gray School of Medical Sciences, where he is head of the Dan David Laboratory for the Search and Study of Modern Humans. He holds the Tassia and Dr. Joseph Meychan Chair for the History and Philosophy of Medicine. During his career he has been engaged in numerous excavations in Israel, responsible for some of the major fossils found in the country and played a key role in establishing and organizing the fossil collection at the Gray Faculty of Medical and Health Sciences.

Anthropology and Ancient DNA

Prof. Israel Hershkovitz

Paleopathology in medicine

Prof. Hershkovitz' varied research touches many aspects of past population life. By providing detailed descriptions of bone modifications for many diseases, he made paleopathology an evidence-based medical discipline. His studies showed how evolution affect current people health (demonstrating that many spinal diseases are "trade off" for bipedalism), and how important diseases were in shaping past population physique (being the right hand of natural selection). He introduced the time dimension into medical thinking and showed how human behavior and climate affect population health in past times. He further showed that the turning point in human population health was at the advent of agriculture, some 10,000 years ago. He documented the first modern humans migrating out of Africa (Misliya cave fossils 200,000 years ago), and retrieved the mother population of all present people outside Africa (Manot cave fossils 55,000 years ago).



Prof. May, PhD, is head of the Biohistory and Evolutionary Medicine Laboratory and of the Department of Anatomy and Anthropology, Gray School of Medical Sciences. Prof. May obtained an MSc in Evolutionary Medicine and a PhD in Physical Anthropology at Tel Aviv University. For her postdoctoral research, she joined the Institute for Evolutionary Medicine at Zurich University, where she specialized in methods of virtual anthropology. She is head of the Dan David Center for Human Evolution and Biohistory Research and the Shmunis Family Anthropology Institute. Prof. May won the Bergmann Memorial Award from the BSF for young scientists.

https://hilamaylab.wixsite.com/bem-lab

Anthropology and Ancient DNA

Prof. Hila May

Biohistory and evolutionary medicine

What make people vulnerable to diseases? Most present-day health hazards, such as obesity, cancer, sclerosis, and arthritis, have their roots thousands or even millions of years ago, when humans began to acquire their current anatomical shape. Prof. May studies recent and past human populations to achieve new insights on long lasting biological and social phenomena. This type of research allows a comprehensive understanding of human behavior, biology and illness. The research is based on a multidisciplinary approach for the study of humankind and combines both genetic and morphological data. The morphological research is carried out using advanced imaging techniques, as well as traditional anthropological methods. The genetic study uses cutting-edge techniques of DNA that is extracted from ancient bones.

CT reconstruction of 2,000-year old mummy of an Egyptian priest

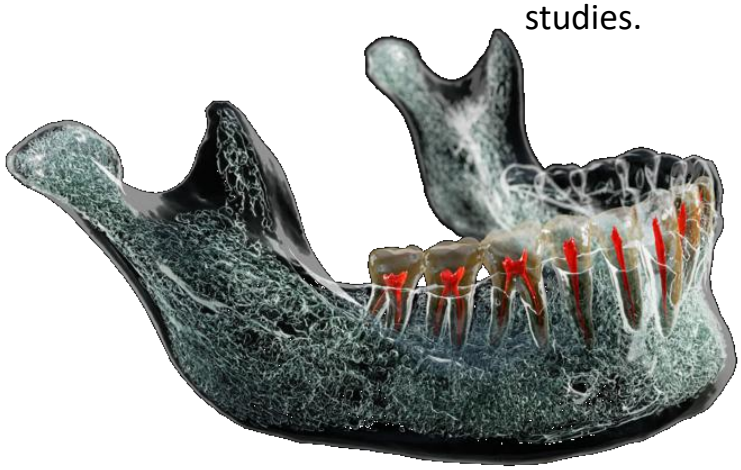
Prof. Sarig, PhD, DMD, is head of the Goldschlager School of Dental Medicine, where she is a principal investigator and the head of the Dental Anthropology Laboratory. Sarig is a graduate of Tel Aviv University, having completed her D.M.D. and her Ph.D. in anatomy and anthropology, and her post-graduate studies in orthodontics (summa cum laude), all at the Gray Faculty of Medical & Health Sciences. Prof. Sarig was previously the Head of the Dan David Center for Human Evolution and Biohistory Research, and the Shmunis Family Anthropology Institute.

Anthropology and Ancient DNA

Prof. Rachel Sarig

Dental anthropology

Understanding who we are and where we come from can shed a light on our future. Many of the current oral diseases and malformations have their roots in our evolutionary history. Knowing the evolutionary processes that led to the current shape and size of our skull and mandible may greatly bear on our understanding of phenomena such as malocclusions, dental malformations and oral diseases. Prof. Sarig's main interest is in studying the evolutionary and environmental effects on oral health in prehistoric populations and their implications on modern societies. The study of the masticatory apparatus is conducted both on prehistoric and modern samples using laboratory models, micro-CT scans and clinical studies.



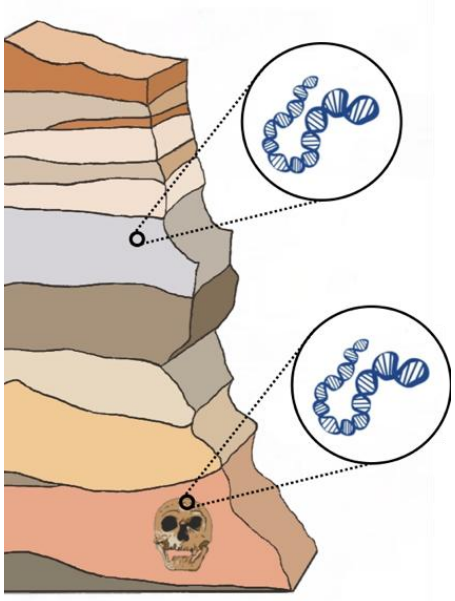
Dr. Slon, PhD, is at the Departments of Anatomy and Anthropology and Human Molecular Genetics and Biochemistry of the Gray School of Medical Sciences and affiliated with the Dan David Center for Human Evolution and Biohistory Research. She has an MSc in Medical Sciences and a BSc in Medical and Life Sciences, both from Tel Aviv University. Her PhD and post-doctoral research on ancient hominin DNA were conducted in the Department of Evolutionary Genetics of the Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany. Dr. Slon is the recipient of the Dan David Prize Scholarship for Young Researchers, the Otto Hahn Medal, the Otto Hahn Award, and the Alon Fellowship.

https://www.tau.ac.il/~viviane/

Anthropology and Ancient DNA

Dr. Viviane Slon

Ancient DNA



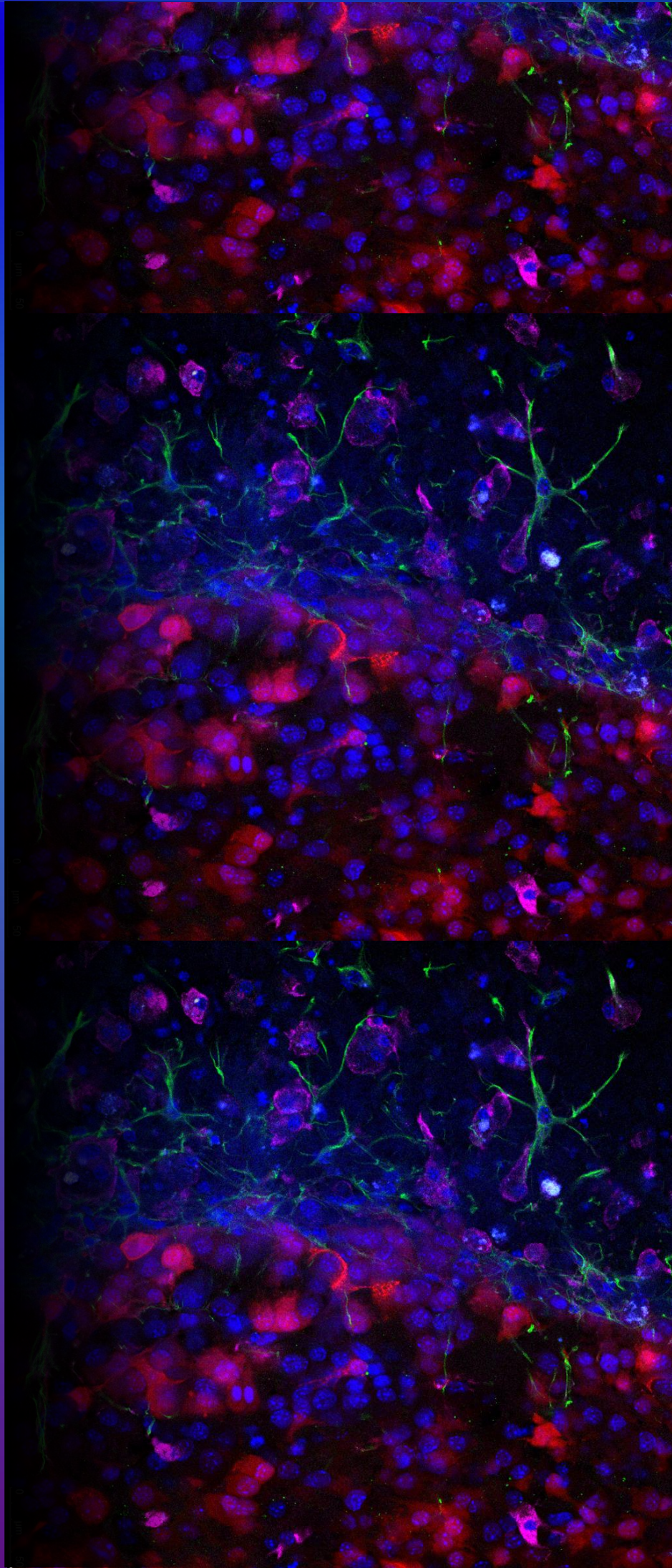
S. Peyrégne

Who were the people living in our region in prehistoric times? Were they related to other populations living elsewhere in the world at the same time? Did they migrate or otherwise interact with populations living in neighboring regions? How were their societies organized? To answer such questions, we analyze DNA from ancient individuals, which we recover both from skeletal remains and from sediments deposited at archaeological sites. We do so by implementing and pursuing the development of state-of-the-art methodology suited to face the challenges of DNA preservation over time in warm climates. Our newly-established laboratory, which includes a clean room facility dedicated to the generation of ancient DNA data, is the first of its kind in Israel. The study of ancient genomes allows to elucidate not only who were the people living in the past, but also how past events affect on our own genomes today.

Cancer and molecular therapies

Affiliations

Cancer Biology Research Center



Melanoma brain metastases. Tumor cells, red; astrocytes, green; microglia, violet. Neta Erez.

Prof. Barnoy, PhD, Department of Nursing, is head of the School of Health Professions. She completed her nursing degree at the Hebrew University of Jerusalem with distinction. She then obtained an M.Sc. (graduated with distinction) and Ph.D. at the Department of Human Genetics of the School of Medicine at Tel Aviv University. Prof. Barnoy previously served as the department chair for two terms. She is active internationally in genetic nursing in the International Society for Nurses in Genetics, who granted her the Founder Award for Excellence in Research. She was nominated as the Israeli delegate in the Global Genomic Nursing Alliance Initiative.

Cancer and Molecular Therapies

Prof. Sivia Barnoy

Nursing genetics and information technology

Patients do not always share hereditary cancer information with their at-risk relatives. Prof. Barnoy is engaged in studies that deal with testing and disclosure of cancer genetic information to blood relatives. She examines factors such as stigma and health beliefs that might influence the decision to be tested and share test results with relatives. Her approach is unique as she studies this question from both the patients, the counselees, and counselors' point of view. Technologies are widely introduced to healthcare, such as electronic health records and telehealth solutions to advanced medical devices and robotics. These emerging technologies will affect nursing care. Prof. Barnoy is performing research to understand the impact of emerging technologies on the nursing profession, specifically related to the care of older people living in the community. The study aims to understand nurses' needs for training, their perception of the impact on the nursing profession, and formulate recommendations to the policymakers.

Prof. Ben-David, PhD, Department of Human Molecular Genetics and Biochemistry at the Gray School of Medical Sciences , completed his PhD at the Hebrew University and his postdoctoral training at the Broad Institute of Harvard and MIT. Prof. Ben-David was selected as a "Next Generation Star" of the American Association for Cancer Research (AACR) and as an EMBO Young Investigator. He has earned several prestigious prizes for early-career scientists, including the 2021 Cells Young Investigator of the Year Award, the 2022 Krill Award by the Wolf Foundation, and the 2023 Kadar Award for Excellence in Research. He is a recipient of the ERC Starting Grant.

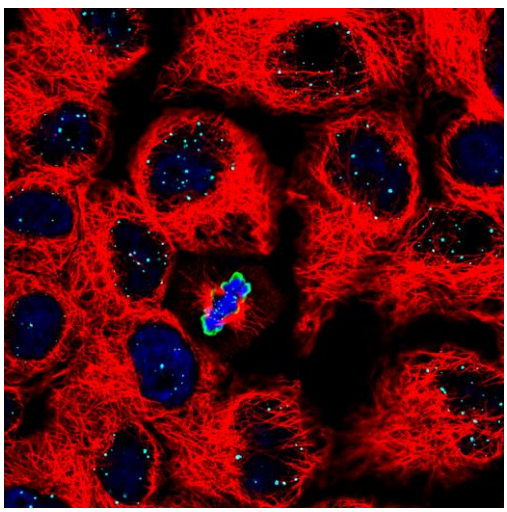
https://www.bendavidlab.com/

Cancer and Molecular Therapies

Prof. Uri Ben-David

Cancer aneuploidy

Healthy human cells have 23 pairs of chromosomes. Any deviation from this number – known as aneuploidy – has very severe consequences. For example, an extra copy of chromosome 21 results in Down syndrome. However, cancer cells are highly aneuploid, and aneuploidy is even required for tumor progression. Prof. Ben-David studies this "aneuploidy paradox" using state-of-the-art genomic and functional approaches. The work in the lab aims to uncover the basic biology underlying this hallmark of cancer, and to exploit it to target cancer cells and eliminate tumors.



Prof. Carmi, PhD, Department of Pathology, Gray School of Medical Sciences , completed his PhD studies summa cum laude at Ben-Gurion University of the Negev and won the Pratt award for excellence PhD students. He completed his postdoctoral training at the Department of Immunology at Stanford University, where he earned the Young Investigator Award. His work on dendritic cell vaccination was published in *Nature* and *Cell* and he has co-authored other manuscripts in peer-reviewed journals, including *Science* and *Immunity*, and written four patents. Based on his findings, he co-founded two companies, Bolt Therapeutics and Gilboa Therapeutics, and he serves as a consultant in Velocity Pharmaceutical Development venture capital, and as a board member at the Israel Society for Gene and Cell Therapy.

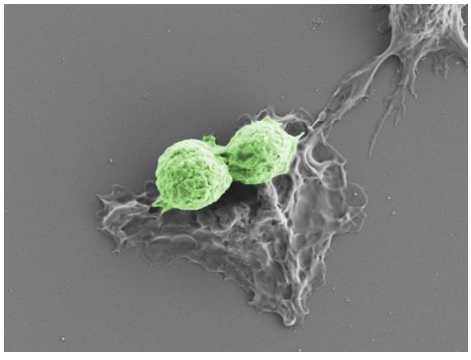
https://www.carmilab.org/

Cancer and Molecular Therapies

Prof. Yaron Carmi

Cancer immunotherapy

Our body's immune system knows how to attack and kill cancer cells – so why isn't this happening in each case? How do we unblock this natural lethal response? Prof. Carmi is taking a fresh approach to the problem using advanced microscopy and genetic engineering to monitor, in real time, how our immune cells communicate with each other. He will use the new understanding to develop better, safer therapies that kick in the natural anti-cancer immune response.



NK cells attacking a tumor cell

Dr. Cohen, PhD, Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences , received her MSc in the field of cancer immunology from the Faculty of Engineering Sciences, Department of Biotechnology Engineering, Ben-Gurion University of the Negev, in a direct MSc track for excellent students, and graduated summa cum laude. She received her PhD in the field of neuro-Immunology from the Department of Neurobiology, the Weizmann Institute of Science. Dr. Cohen performed her postdoctoral training in immuno-genomics at the Weizmann Institute of Science and cancer immunology at the Department of Oncological Sciences, Icahn School of Medicine at Mount Sinai, New York. She won the Feinberg Graduate School Prize for Outstanding Achievements in Postdoctoral Research, and the Ministry of Science and Technology Scholarship for Postdoctoral Fellows in Applied and Engineering Science.

https://www.mcohenlab.com/

Cancer and Molecular Therapies

Dr. Merav Cohen

Immunotherapy targets using single-cell analysis

Tissue development, homeostasis and pathologies are highly regulated processes orchestrated by intercellular crosstalk between immune cell niche and tissue resident cells, not necessarily from the immune lineage. Dr. Cohen incorporates state-of-the-art single cell RNA-sequencing technologies, murine models, clinical approaches and advanced computational methods in order to reveal the molecular signature of interacting cells that drives exclusive cell function. The lab aims to assess similarities and discrepancies in interactome molecular signature between tissue development process and cancerous conditions in order to identify novel immunotherapy targets, directed against intercellular crosstalk.

Prof. Erez, PhD, Department of Pathology at the Gray School of Medical Sciences , began her academic career at the Faculty of Agriculture, Hebrew University, where she received her B.Sc. She then proceeded to complete her M.Sc. and Ph.D. at the Weizmann Institute of Science in tumor immunology. Supported by a fellowship from the Cancer Research Institute, Erez performed her postdoctoral research at UCSF. She is on the European Association for Cancer Research (EACR) board, is Vice President of the Israeli Society for Cancer Research (ISCR) and is President of the International Metastasis Research Society. Prof. Erez serves as Vice Dean for Teaching Innovation and Mentoring. She was awarded the Kadar Family Award for Outstanding Research at Tel Aviv University.

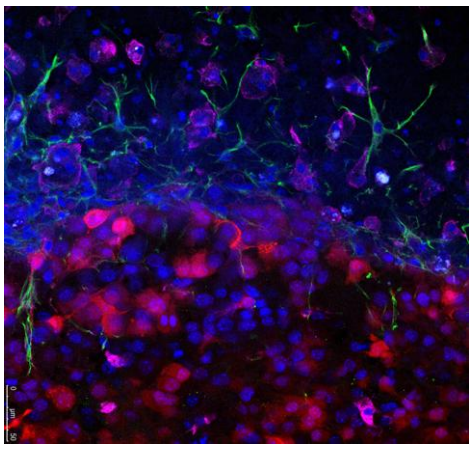
https://netaerez.tau.ac.il/

Cancer and Molecular Therapies

Prof. Neta Erez

Tumor microenvironment in metastasis

The research of Prof. Erez is focused on tumor biology, tumor microenvironment, cancer-related inflammation and the role of stromal cells in facilitating tumor progression and metastasis. Her main focus is in understanding the early stages of metastatic relapse, and the role of the metastatic microenvironment. Prof. Erez studies these crucial aspects of cancer using genetically engineered models of breast cancer and of melanoma. The main goal of the studies is to identify key molecular pathways in the communication between tumor cells and their microenvironment that can be targeted by novel therapeutics, to prevent tumor metastasis.



Melanoma brain metastases: Tumor cells, Astrocytes, Microglia

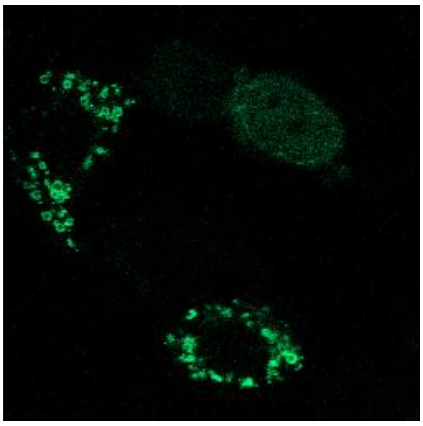
Prof. Fishelson, PhD, Department of Cell and Developmental Biology at the Gray School of Medical Sciences , is a Professor Emeritus and a past incumbent of the Roberts-Guthman Chair in Immunopharmacology. He served as President of both the International Complement Society and European Complement Network (ECN) and was awarded an ECN Gold Medal. He is a board member of the Israeli Society for Cancer Research and of the Israel Immunological Society and member of the Henry Kunkel Society. He is an editorial board member of *Molecular Immunology* and associate editor of *Frontiers in Immunology*.

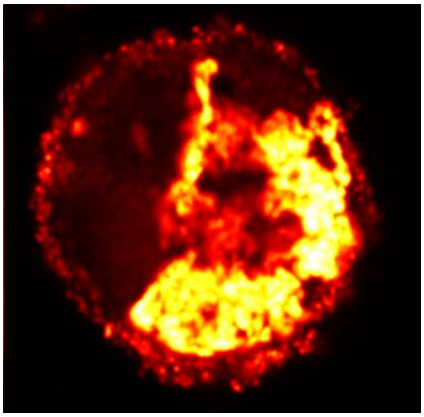
Cancer and Molecular Therapies

Prof. Zvi Fishelson

Cancer cells resisting immunity

Several therapeutic approaches try to enlist the patient's immune system for killing of her/his cancer. All these approaches face a major obstacle: cancer cells are resistant to any type of damage inflicted by the armory of our immune system. Prof. Fishelson has uncovered several defense strategies employed by cancer cells to resist immune attack. His team is currently investigating the molecules that protect the cancer cells and their mode of action and seeks potential intervention points through which this protection could be annulled. They develop molecules that block resistance of cancer cells, sensitize them to available immunotherapies and enable the patient's immune system to destroy its cancer.





Prof. Gal, PhD, is a faculty member in the Department of Oral Biology at the School of Dental Medicine. He completed his PhD studies at the Department of Chemical Physics at the Weizmann Institute of Science and was an HFSP postdoctoral fellow at the Harvard Medical School. He ran an independent lab at Migal in northern Israel before arriving to Tel Aviv University. Gal co-founded two biotech companies dealing with food and Ag.Chem protein modulators.

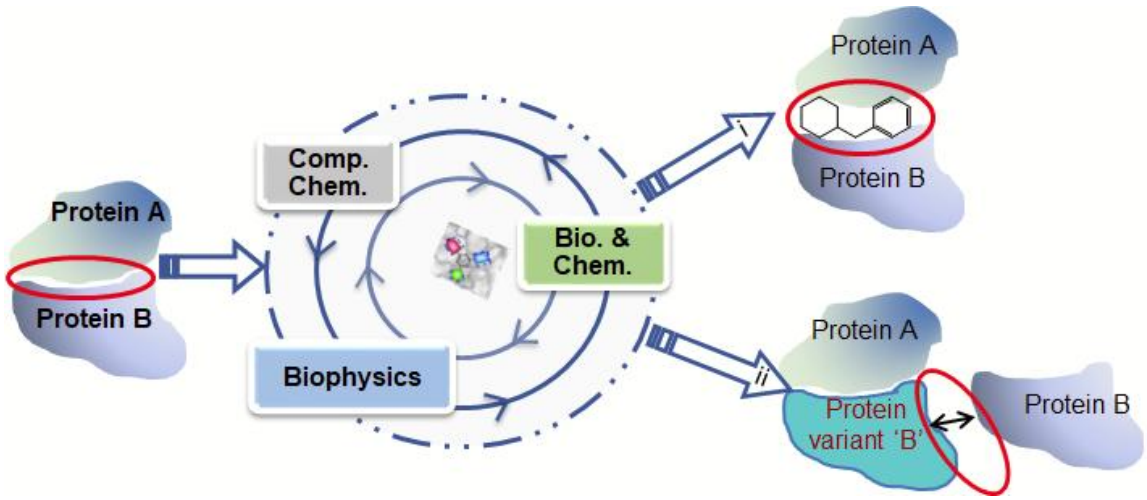
https://maayaangaal.wixsite.com/galma

Cancer and Molecular Therapies

Prof. Maayan Gal

Protein-protein interaction modulators for therapy

The laboratory focuses on the discovery and development of novel protein modulators as the basis for new therapeutics. Of main interest are the challenging targets belonging to the biological space of protein-protein interactions (PPIs). For this purpose, Dr. Gal's team is integrating cutting-edge computational, biophysical and cellular biology tools.



Design of PPI therapeutics by the development of novel small molecules and high-affinity peptide/protein molecules

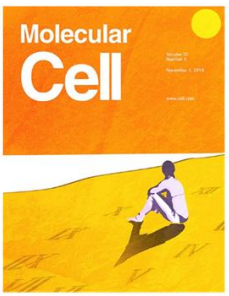
Prof. Levy, PhD, is in the Department of Human Molecular Genetics and Biochemistry at the Gray School of Medical Sciences. She performed her PhD at the Hebrew University of Jerusalem and her post-doctoral training at the Harvard Medical School and Broad Institute. Since establishing her research team, Levy received the ERC Consolidator Award, the Rector and Dean Excellence in Teaching Awards, and the International Young Melanoma Investigator Award of the Society of Melanoma Research.

https://carmitlevylab.com/

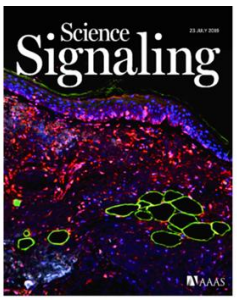
Cancer and Molecular Therapies

Prof. Carmit Levy

Dror et al *2016*



Malcov et al *2018*



Golan et al *2019*

Cancer development and other side of UV exposure

The human body takes different measures in order to protect itself against the results of UV exposure and its accompanied hazards, such as skin cancer. Despite extensive studies regarding the molecular regulation of the two main UV protection mechanisms, namely, the DNA repair system and the pigmentation system, a comprehensive theory that simultaneously accounts for the two systems is still missing. Levy's team aims to elucidate, for the first time, the dynamic control used to schedule and synchronize the UV protection subsystems.

Furthermore, melanoma is the most lethal skin cancer. It is also a preventable cancer with the most rapid increase in its incidence. Although the majority of patients are diagnosed in the early phase of disease, about 10% of patients will develop systemic disease and succumb to it. Check-point inhibitors (CPIs) and targeted agents (TAs) have had a tremendous impact on this disease's course. Levy aims to find biomarkers for melanoma treatment response and to further dissect their mechanism of action, in order to enhance the effectiveness of immunotherapy.

Prof. Madi, PhD, is at the Department of Pathology in the Gray School of Medical Sciences. He heads the Systems Immunology Lab. He completed his PhD studies at Tel Aviv University in computational immunology. Prof. Madi then continued to do a postdoctoral fellowship at Harvard Medical School, Brigham and Women Hospital, Broad Institute of Harvard and MIT, Boston, USA where he mainly focused on the study of T-cell differentiation and cancer immunology.

www.asafmadilab.com

Cancer and Molecular Therapies

Prof. Asaf Madi

Systems immunology for cancer

Can we activate our immune system to fight cancer? What immune cells are important and what prevents them from exercising their anti-tumor functions? Can we trigger these specific immune cells to destroy cancer cells and at the same time provide an immunological memory to prevent recurrence of the disease? The main interest of the lab is studying gene circuits of immune cells, focusing on differentiation, activation, and regulation. His team explores these cells and circuits primarily in the context of tumor pathology, following stimulation, immunotherapies, or cell-cell interactions. They apply cutting-edge technologies, including 3D bioprinting of tumors, single-cell RNA-seq, spatial transcriptomics, mouse tumor models, molecular biology, and other high-throughput genetic and genomic methods. These are combined with advanced computational approaches to identify and functionally characterize genes that play a critical role in immune cell circuits and their effects on tumor growth. This approach enables in-depth studies of immune cell signaling within the tumor microenvironment.

Prof. Milyavsky, PhD, is at the Department of Pathology, Gray School of Medical Sciences, where he is a principal investigator and the head of the Hematopoietic Stem Cell and Leukemia Laboratory. Dr. Milyavsky is a graduate of the Weizmann Institute of Science, having completed his M.Sc. and Ph.D. in molecular and cellular biology. Michael completed his post-doctoral training in hematopoiesis and leukemia at the University of Toronto, Canada.

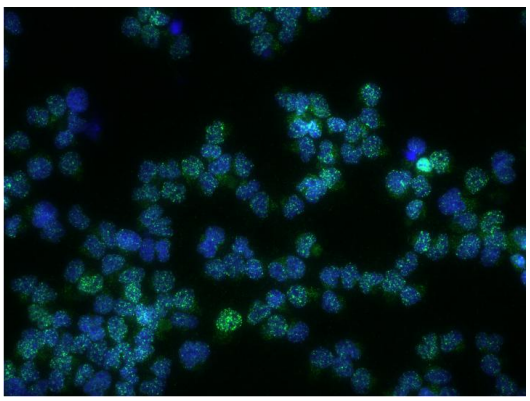
www.milyavskylab.com

Cancer and Molecular Therapies

Prof. Michael Milyavsky

Leukemia and hematopoietic stem cells

As we age, our blood (hematopoietic) stem cells (HSCs) suffer from accumulated mutations in their DNA that eventually can lead to accelerated leukemogenesis and/or inefficient immune response. How normal and leukemia stem cells regenerate after acute or chronic damage is our main research interest. Dr. Milyavsky addresses these questions by studying DNA damage signaling and its outcomes in highly purified human normal and leukemia cell subsets. Uniquely, the team uses humanized mice and genetic engineering to monitor in real time how normal and leukemia stem cells communicate with other bone marrow cells in the process of regeneration. They use this new understanding to stop regeneration of leukemia cells without harming normal HSC.



DNA damage foci in hematopoietic progenitors after radiation exposure. Confocal microscope image, x400

Dr. Oren, PhD, is a faculty member in the Department of Human Molecular Genetics and Biochemistry at the Gray School of Medical Sciences. She completed her PhD at Tel Aviv University and her postdoctoral training at the Broad Institute of Harvard and MIT. She was recently selected as a Zuckerman Faculty Scholar. She has earned several prestigious prizes and grants for early-career scientists, including the ERC Starter Grant, the American Association for Cancer Research Women in Cancer Scholar Award, the Rivkin Award, and the Cozzarelli Prize for scientific excellence and originality in biomedical sciences.

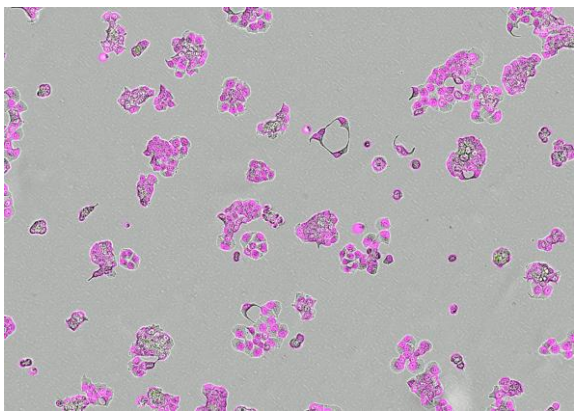
https://www.yaaraoren.sites.tau.ac.il/

Cancer and Molecular Therapies

Dr. Yaara Oren

Cancer persister cells

Dr. Oren's lab studies non-Darwinian evolution in the context of cancer therapy. The team focuses on a recently discovered sub-population of cancer cells, called persister cells, that can evade therapy through a non-mutational reversible mechanism. They combine experimental and computational approaches to uncover the basic biology underlying the ability of cells to survive drug onslaught in the absence of a resistance-mediating genetic alteration. Oren develops new tools and systems to study reversible resistance in hope to pave the way for new therapeutic approaches that could prevent the emergence of genetic resistance.



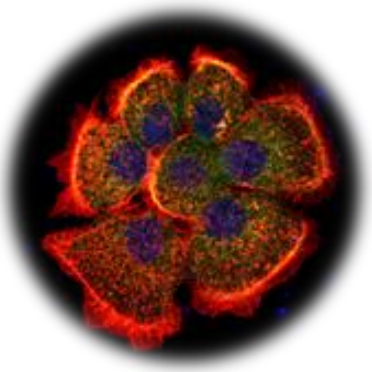
Prof. Rosin-Arbesfeld, PhD, is in the Department of Human Microbiology and Immunology in the Gray School of Medical Sciences. She received her PhD in Biochemistry and Microbiology from TAU and trained as a post-doctoral fellow at the MRC-LMB in Cambridge, UK. Rosin-Arbesfeld serves as Vice Dean for Preclinical Affairs and head of the Preclinical Promotions Committee of the School of Medicine. Rosin-Arbesfeld has competitive grant funding from the US-Israel Binational Science Foundation, the Jerome Lejeune Foundation, and the German-Israeli Foundation for Scientific Research and Development, ICRF, and DKFZ-MOST.

https://rosin-arbesfeld.sites.tau.ac.il/

Cancer and Molecular Therapies

Prof. Rina Rosin-Arbesfeld

Molecular signaling pathways in cancer and health



Wnt signaling is one of the most fundamental signaling cascades in development and homeostasis. Aberrant activation of the Wnt pathway is associated with numerous diseases, most notably in colorectal cancer (CRC).

The Rosin-Arbesfeld lab focuses on different aspects of Wnt signaling in sickness and health. The team conducts comprehensive genetic and biochemical screens to isolate novel Wnt pathway regulators to identify new therapeutic targets. Currently, the team is involved in pre-clinical and clinical trials to restore the normal expression of the APC tumor suppressor, which is known to inhibit the Wnt pathway and is mutated in CRC patients.

Other projects reveal the involvement of Wnt signaling in mature circulating human immune cells and the team is also looking into the relationships between Wnt signaling and the gut microbiome.

Prof. Satchi-Fainaro, PhD, is at Department of Physiology and Pharmacology and head of the Gray School of Medical Sciences. She heads the Cancer Research & Nanomedicine Laboratory, the TAU Kahn 3D BioPrinting Initiative and holds the Kurt and Herman Lion Chair in Nanosciences and Nanotechnologies. She completed her PhD in Polymer Chemistry and Cancer Nanomedicine at the University of London and her postdoctoral training at Harvard University and Children's Hospital Boston working on Vascular and Cancer Biology. She was awarded the Fulbright, Rothschild, and JULUDAN Prizes, Teva Pharmaceutical Industries Founders Award, the 2019 Youdim Family Prize for Excellence in Cancer Research, 2020 Kadar Family Award for Outstanding Research, the 2020 Humboldt Foundation Bessel Research Prize, and "Woman of the Year" by Globes magazine. She serves on the Board of Directors of Teva Pharmaceutical Industries Ltd.

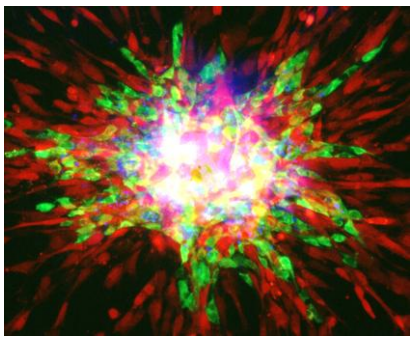
https://satchifainarolab.com/

Cancer and Molecular Therapies

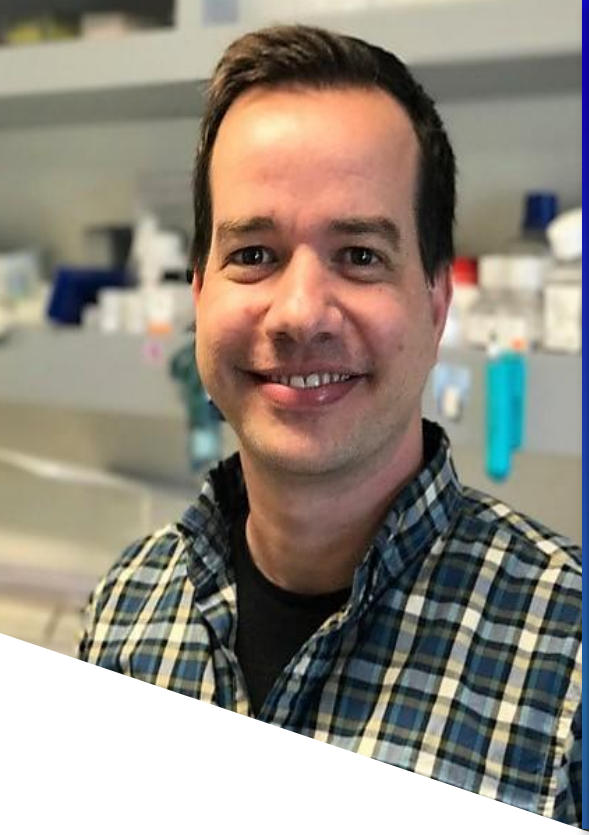
Prof. Ronit Satchi-Fainaro

Nanomedicine

Major efforts invested into the development of new drugs often fail to be translated into meaningful clinical benefit for cancer patients. Developing effective novel therapeutics for cancer while accurately predicting their clinical success in certain cancer types remains an urgent unmet medical need. Prof. Satchi-Fainaro incorporates cutting edge multidisciplinary basic, translational and clinical approaches to explore this scientific "blind spot". To this end, Satchi-Fainaro develops clinically relevant 3D cancer models that better capture the clinical characteristics and drug responsiveness of human cancer. These models are being exploited for the development of efficacious clinically-translatable therapies for various cancer types. Her vision is that this multidisciplinary approach will revolutionize our perception of tumor progression and consequently the way we diagnose and treat cancer.



3D glioblastoma. Cancer cells in red, endothelial cells in green, nanomedicine in blue



Dr. Shifrut, PhD, holds a joint position at the Department of Pathology, Gray School of Medical Sciences, Gray Faculty of Medical & Health Sciences and the Faculty of Life Sciences at Tel Aviv University and is a principal investigator at the Tel-Aviv Sourasky Medical Center. Dr. Shifrut completed his graduate studies under the mentorship of Prof. Nir Friedman at the Weizmann Institute of Science, mapping the TCR repertoire in health and disease. For his postdoctoral training, he joined Alex Marson at UCSF and Gladstone Institutes to pioneer CRISPR discovery platforms to study primary human T cells.

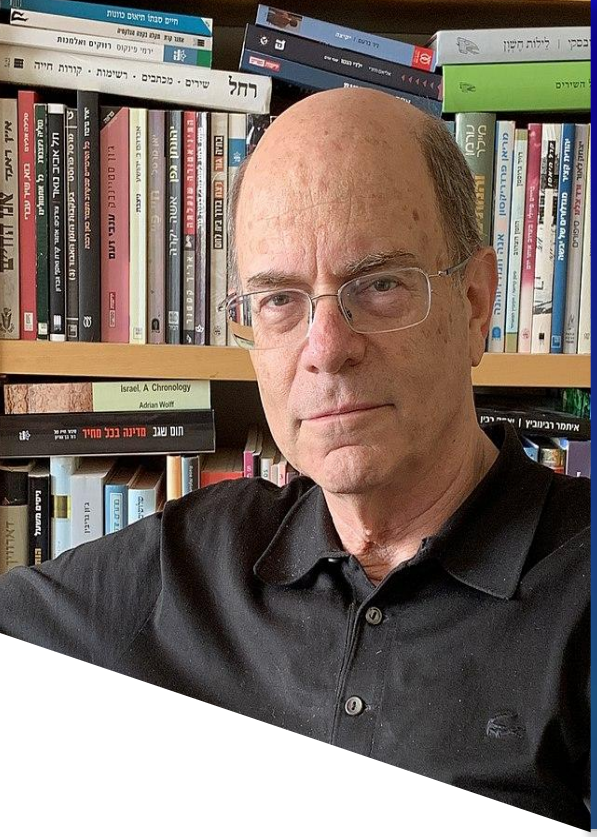
http://www.shifrut-lab.org/

Cancer and Molecular Therapies

Dr. Eric Shifrut

Immuno-oncology & cell engineering

Adoptive T cell therapies are a new class of living drugs, achieving durable results in a subset of patients with aggressive malignancies. These transformative outcomes are not shared with the majority of patients with solid tumors that remain resistant to current T cell therapies. Dr. Shifrut develops and leverages CRISPR-based platforms in primary human T cells to discover ways to engineer robust anti-tumor immunity. His goal is to design breakthrough cell-based therapies and learn how to engineer immune cells to function in the suppressive tumor microenvironment. His team uses lentiviral vectors, precise knock-in by CRISPR-mediated HDR and advanced experimental tools to map genetic programs that control anti-tumor immunity. The lab aims to test promising candidate perturbations in preclinical animal models of cancer immunology. His laboratory is uniquely positioned to address these translational gaps.



Prof. Shiloh, PhD, Professor Emeritus, heads the Myers Laboratory for Cancer Genetics at the Department of Human Molecular Genetics and Biochemistry at the Gray School of Medical Sciences. He obtained his Ph.D. in Human Genetics at the Hebrew University of Jerusalem and trained at the Harvard Medical School, University of Michigan, New York University Cancer Center, Memorial Sloan Kettering Cancer Center and Rockefeller University, and was a Fogarty Fellow at the U.S. National Institutes of Health. He is a member of the Israel National Academy of Sciences and Humanities and won the 2005 EMET Prize in Life Sciences, the American Association of Cancer Research G.H.A. Clowes Memorial Award for Outstanding Accomplishments in Cancer Research, the Israel Prize in Life Sciences and the Olav Thon Prize in Natural Sciences and Medicine (Oslo, Norway). Shiloh is a member of the US National Academy of Sciences. He has dedicated most of his scientific career to understanding A-T. He gives popular scientific lectures to the general public on the medical, social and ethical implications of the genome revolution.

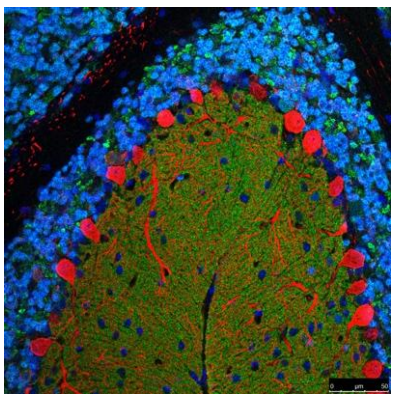
https://www.tau.ac.il/~yossih/

Cancer and Molecular Therapies

Prof. Yossi Shiloh

Genome instability in disease

The Shiloh lab studies the implications of genome instability on our health. Our DNA is constantly damaged by internal and external DNA damaging agents. In response to this ongoing threat to the genome, the DNA damage response (DDR) – a broad signaling network is activated. The Shiloh lab discovered a key player in this system – the protein kinase, ATM. This discovery was a result of a long quest to identify the gene responsible for a human genome instability syndrome called ataxia-telangiectasia (A-T). A-T involves cerebellar degeneration and cancer stability and continues to decipher the physiological basis of the many symptoms of A-T, particularly the cerebellar attrition. Recently, the lab initiated an investigation of the role of genome instability in aging and cellular senescence.



Mouse cerebellum. Purkinje cells, which gradually disappear in A-T patients, highlighted in red.

Dr. Inbal Wortzel is a faculty member in the Department of Human Molecular Genetics and Biochemistry at the Gray School of Medical Sciences, Tel Aviv University. She earned her Ph.D. in Biology from the Weizmann Institute of Science. Dr. Wortzel completed her postdoctoral training at Weill Cornell Medicine in New York City under the mentorship of Prof. David Lyden, where she investigated the role of extracellular vesicle (EV) DNA in cancer progression. Her research focuses on understanding how tumors communicate with the immune system through EVs, with the goal of identifying novel biomarkers and therapeutic targets for metastatic cancer. During her postdoctoral studies, she was awarded grants from Worldwide Cancer Research and the WCM RAPP program. Dr. Wortzel was recently named a Zuckerman Faculty Scholar for the academic year 2025.

Human Molecular Genetics and Biochemistry

Dr. Inbal Wortzel

Cracking cancer's code

Dr. Inbal Wortzel is a cancer researcher exploring how cancer cells send messages to other parts of the body. She studies tiny particles called extracellular vesicles (EVs), which carry bits of genetic material that can influence how the immune system responds to cancer and how the disease spreads. In her recent work, she discovered that DNA inside these particles can either help or hinder the body's ability to fight cancer. Her goal is to use this knowledge to find better ways to detect cancer early and stop it from spreading.

Cardiovascular Research and Diseases

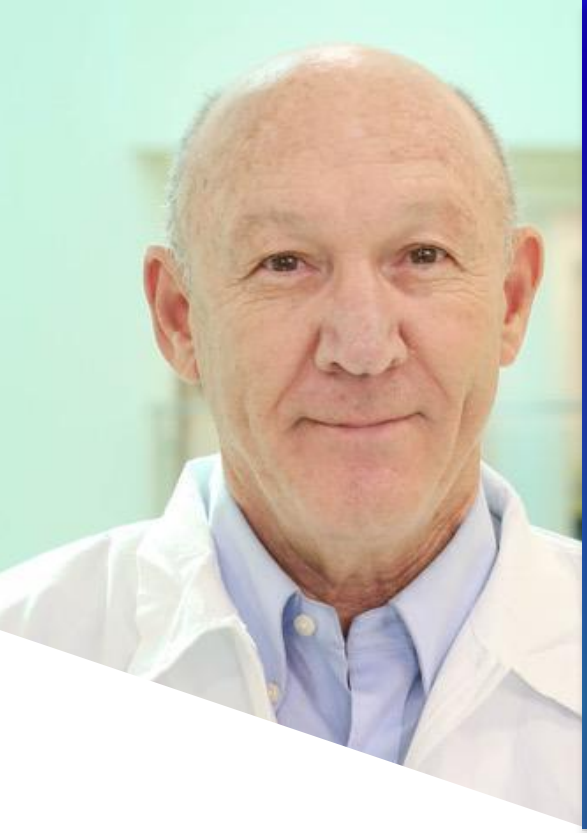
Affiliations

Neufeld Cardiac Research Institute at the Sheba Medical Center,
Affiliated with the Faculty

Credit: Leslie Synder Portney

Artist statement

The bravery of compassion, to love and the commonality of our experiences as human beings are key themes in my artwork. This heart series are my translations of our heroic journey. I use color, pattern, texture, and symbols to depict our universal human experiences such as birth, evolution, revelation, temporality, beauty, the sacredness of life, and experiences of suffering and joy. The image of the heart resonates for me as a symbol of these journeys.



Prof. (Yoni) Leor, MD, is a Professor of Cardiology at TAU and previously the Director of the Neufeld and Tamman Cardiovascular Research Institutes at TAU and the Sheba Medical Center. He is a cardiologist and physician-scientist. He obtained his MD degree from Tel Aviv University. He completed his medicine residency and cardiology training at the Sheba Medical Center, Israel. Leor performed a post-doctorate fellowship in cardiovascular regenerative medicine at the University of Southern California. He served as the director of the Intensive Cardiac Care Unit at Soroka Medical Center and head of the Experimental Cardiology Lab at Ben-Gurion University. He was previously the director of the Neufeld and Tamman Cardiovascular Research Institutes at Tel Aviv University and the Sheba Medical Center.

https://leor-lab.wixsite.com/leor

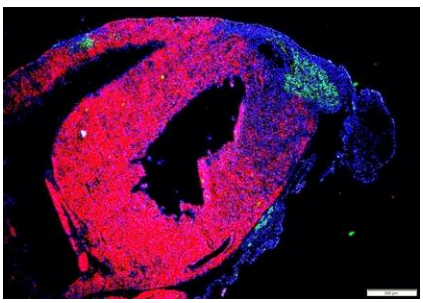
Cardiovascular Research and Diseases

Prof. Jonathan Leor

Cardiovascular regeneration

Prof. Leor's research includes the study of the heart's lack of reparative ability. His research group approached the challenge from a different angle by studying the role of extracellular matrix and immune cells in heart repair. Leor pioneered the use of scaffolds and injectable biomaterials to treat heart diseases. His lab was the first to target macrophages to improve infarct healing.

His work has led to establishing a novel line of research dedicated to understanding how the immune system and extracellular matrix affect heart repair. He was the first in Israel to develop novel cardiovascular regenerative therapies, such as cardiac stem cell therapy, tissue engineering, and gene therapy. Leor is a co-inventor of breakthrough injectable biomaterial to treat heart attacks and heart failure.



Myocardial regeneration. Macrophages (green cells) infiltrate the injured heart (red) of neonatal mouse and promote heart repair. Tal Konfino & Leor.

Dr. Melnikov, PhD, from the Department of Nursing of the School of Health Professions, is the head of the 4-year Bachelor of Arts in the Nursing program, which enrolls over 700 students. He earned his nursing degree at Tel Aviv University and then a M.Sc. and a Ph.D. at the Department of Cell and Developmental Biology at the School of Medicine, Tel Aviv University.

Cardiovascular Research and Diseases

Dr. Semyon Melnikov

Self-care among heart failure patients

Heart failure (HF) is a complex, multifactorial syndrome resulting from impaired heart function. It is a serious clinical and public health problem affecting 64.3 million people worldwide and about 180,000 people in Israel. “Heart failure self-care” refers to practices in which patients engage in maintaining their own health (e.g., taking medications as prescribed, monitoring their weight, engaging in physical activity, etc.), and in decision-making to successfully manage signs and symptoms. Appropriate HF self-care is associated with improved survival, less frequent hospital admissions and ER visits, and improved quality of life. However, HF self-care is challenging for patients and families, with 50–62% of patients not adhering to prescribed medications and 14–48% not adhering to lifestyle changes. Dr. Melnikov’s research is centered around identifying the factors that impact self-care practices and exploring the barriers that hinder patients with HF from engaging in appropriate self-care.

Computational & AI Biomedical Research

Affiliations

Edmond J. Safra Center for Bioinformatics

Alrov Center for Digital Medicine

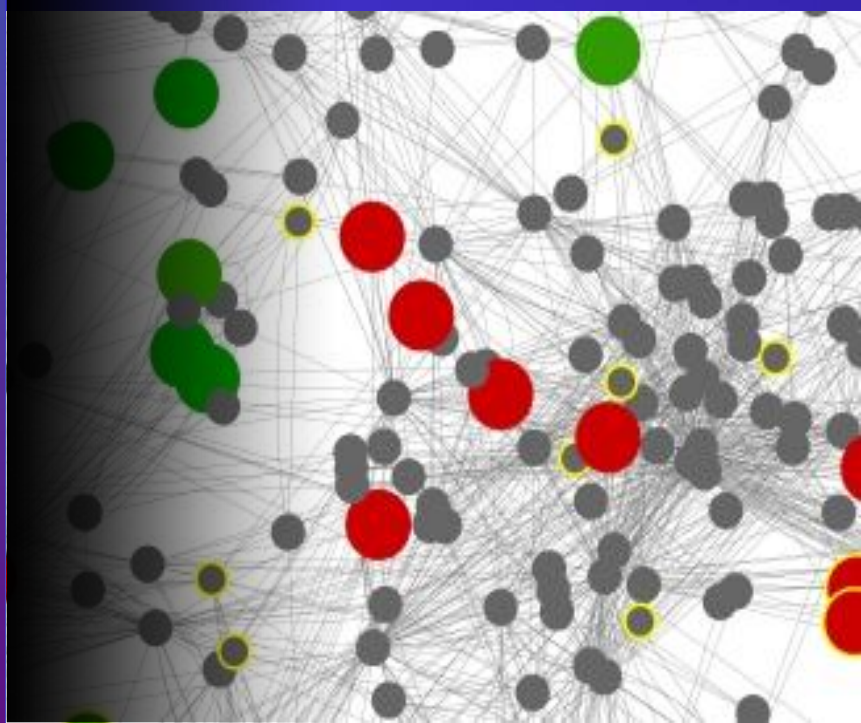
Developing novel computational tools to study a wide variety of biological problems and systems

A huge scope and scale of biomedical data is being generated by modern molecular technologies

Sophisticated computational techniques needed for analyzing, modeling, and mining data

Several research groups are dedicated to computational biomedical research

Topics range from the role of gut microbes on human health to the impact of genetic variation on disease risk



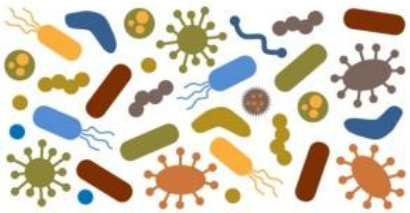
Prof. Borenstein, PhD, is a Professor at the Gray School of Medical Sciences, Gray Faculty of Medical & Health Sciences and at the Blavatnik School of Computer Science at Tel Aviv University. He is head of TAU's Edmond J. Safra Center for Bioinformatics, the Alrov Center for Digital Medicine, and an external professor at the Santa Fe Institute. Prof. Borenstein received his BSc in physics and computer science and his PhD in computer science from Tel Aviv University and held a joint postdoctoral position at Stanford University and the Santa Fe Institute. In 2010, he joined the Department of Genome Sciences at the University of Washington as a faculty member, and in 2018, moved to Tel Aviv University with a joint appointment in Medicine and in Computer Science. Prof. Borenstein is the recipient of the Alfred P. Sloan Fellowship and the NIH New Innovator Award.

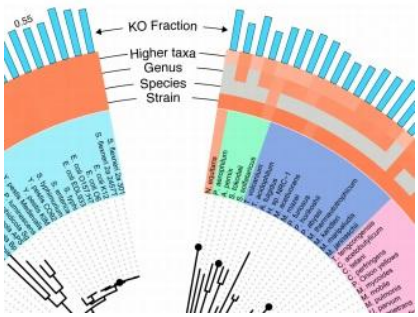
https://borensteinlab.sites.tau.ac.il/

Computational Biomedical Research

Prof. Elhanan Borenstein

Computational microbiome research





The human microbiome – the complex ensemble of microorganisms that populate the human body – has a tremendous impact on our health. World-wide research initiatives and novel metagenomics-based studies now provide exciting insights into the previously uncharted composition of the microbiome, and reveal marked compositional changes associated with a wide range of diseases. Yet, a system-level understanding of the human microbiome and its impact on the host is still lacking. To address this challenge, Prof. Borenstein focuses on the computational study of the human microbiome, spearheading research in microbiome systems biology. His group develops novel computational methods inspired by data science machine learning, metabolic modeling, and network theory to model the microbiome, to analyze multi-omic microbiome data, and to better understand the role of the microbiome in health and in disease.

Prof. Elkon, PhD, Department of Human Genetics and Biochemistry at the Gray School of Medical Sciences, has his training in Physics and Bioinformatics. He is a member of the Safra Center for Bioinformatics. He completed his Ph.D. at TAU and his postdoctoral research at the Netherlands Cancer Institute.

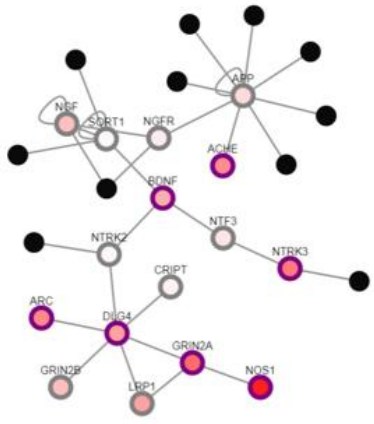
http://www.elkonlab.tau.ac.il/

Computational Biomedical Research

Prof. Ran Elkon

Computational tools for prevention of disease

Our genomes are 99.9% identical. The 0.1% variation determines not only the uniqueness of each one of us, but also our predisposition to common diseases such as cancer, heart diseases, diabetes, schizophrenia, and Alzheimer's Disease. Understanding how genetic variants affect the risk for developing these diseases is a major challenge of current human genetic research, and Prof. Elkon's lab develops and applies novel computational tools to decipher such links. Gaining a better understanding of genetic risk factors to common diseases will allow the identification of individuals who are at high risk before the onset of the disease and subject them to preventive regimens.



Development, Aging and Regeneration

Affiliations

Switzerland Institute of Developmental Biology

Healthy Longevity Research Center

Herczeg Institute on Aging

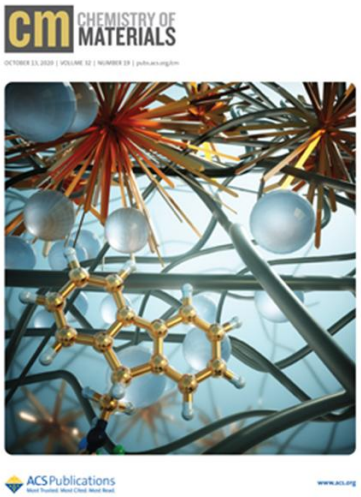
Contractile activity of actomyosin A: a miniature world (cell) where toy-like workers (formins: cyan and myosin: green) are reshaping the surface of their world (cell membrane: white) by pulling metal meshes (actin filaments). Diego Pitta de Araujo.

Prof. Adler-Abramovich, PhD, School of Dental Medicine, serves as a principal investigator and heads the Laboratory of Bioinspired Materials and Nanotechnology. She studied biology at Tel Aviv University, where she earned both her M.Sc. (summa cum laude) and her Ph.D. Prof. Adler-Abramovich has received numerous prestigious grants and awards, including the ERC Starting Grant and the ISF-Center for Excellence Grant. She has published more than 100 peer-reviewed papers in top journals such as *Nature Nanotechnology*, *Nature Chemical Biology*, *Nature Communications*, *Nano Letters*, and *ACS Nano*. Additionally, she is the inventor of over 10 patents.

https://www.lihiadler.sites.tau.ac.il/

Development, Aging and Regeneration

Prof. Lihi Adler-Abramovich



Bone regenerative medicine

Bone regeneration is a critical challenge in the treatment of fractures, bone loss due to tumor resection, and alveolar bone deficiencies. Approximately 2.2 million bone graft procedures are performed annually worldwide. Despite significant progress in bone tissue engineering, there is an unmet need for patient-specific long-lasting bone restoration. Prof. Adler-Abramovich's research in the Laboratory of Bioinspired Materials is focused on mimicking self-assembly processes that occur in nature, including biomineralization and the organization of short peptides and amino acids into ordered nanostructures. We are a materials science laboratory with emphasis on organic chemistry and medical-biological applications. The group aims to develop customized supramolecular scaffolds that will promote personalized therapy for bone regenerative medicine, thus significantly advancing the fields of tissue engineering and materials science while offering a novel solution to a major healthcare issue.

Prof. Ashery-Padan, PhD, is at the Department of Human Molecular Genetics and Biochemistry at the Gray School of Medical Sciences, a member of the Sagol School of Neuroscience and holds the Zucker–Sussman Chair for Glaucoma Research. Ashery-Padan completed her MSc and PhD at the Hebrew University of Jerusalem and her postdoctoral training at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany. She is the recipient of the Teva Prize, and the E. Matilda Ziegler Foundation for the Blind Award. Prof. Ashery-Padan heads the Yoran Institute for Human Genome Research.

https://www.asherypadan.sites.tau.ac.il/

Development, Aging and Regeneration

Prof. Ruth Ashery-Padan

Development and disease of the visual system

Prof. Ashery-Padan's research group focuses on understanding the molecular mechanisms that control the development of the visual system in mammals. The group established and employs transgenic mouse lines for state-of-the-art functional studies of genes in vivo. This is combined with gene-expression profiles using laser capture and single-cell sequencing, transcription factor activity on target genes, and chromatin structure during development. Her group studies ocular cell types generated from human stem cells to uncover the molecular mechanisms underlying the differentiation of human lineages, and to model human diseases. The work is contributing to understanding the etiology of monogenic and complex retinal diseases, toward a better prediction of individuals' susceptibility and the design of stem cell-based models and future therapies for blinding diseases.

Cytoarchitecture of the mature mouse retina - subset of retinal cell types are identified by immunostaining. Shaul Raviv, Ashery-Padan.

Dr. Bar, PhD, is a faculty member at the School of Dental Medicine. Dr. Bar earned his bachelor's degree in physics and biology from Tel Aviv University. He later went on to complete his PhD in Genetics at the Hebrew University of Jerusalem in the lab of Prof. Gruenbaum, where he worked on the nuclear lamina and lifespan regulating pathways in *C. elegans*. He continued to a visiting-fellow position in the lab of Dr. Francis Collins at the National Human Genome Research Institute, the National Institutes of Health, USA. He serves as guest editor of *JOVE*.

https://barlabtau.wixsite.com/website

Development, Aging and Regeneration

Dr. Daniel Bar

Molecular biology of aging

Aging is the major risk factor for many prevalent diseases in the developed world, including cancer, diabetes and cardiovascular disease. Systemically slowing the aging process has been shown to delay the onset of many diseases and prolong health span and lifespan in multiple model organisms. We now know of metabolic and pharmacological interventions that slow aging, and of epigenetic modifications that correlate with aging with exceptional accuracy. However, the molecular details of these interventions, as well as natural aging, are only partially known. The Bar lab develops new tools and applies them to study the molecular changes that accompany aging. These include using antibodies and various enzymes to label proteins, DNA and RNA and analyze them using high-throughput methods.

Prof. Benayahu, PhD, is Professor Emeritus at the Department of Cell and Developmental Biology in the Gray School of Medical Sciences. She is currently the President of the Israel Calcified Tissue Society and was previously the Director of the Marian Gertner Institute for Medical Nano-systems. Prof. Benayahu's research is funded by the US-Israel Binational Science Foundation, the Israel Science Foundation, the Ministry of Health, the Ministry of Science, and the Ministry of Commerce. She has served as editor of a book, guest editor on special issues and reviewer for numerous international journals.

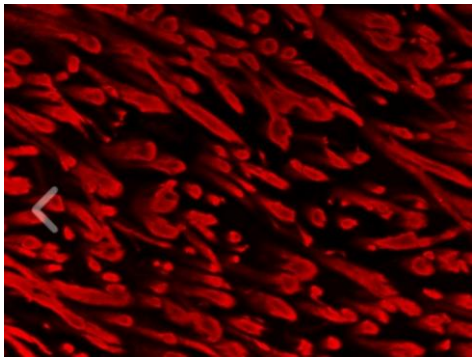
https://benayahulab.wixsite.com/benayahudafnatau

Development, Aging and Regeneration

Prof. Dafna Benayahu

Stem cell metabolism & tissue regeneration

Prof. Benayahu's research has two arms: one is on mesenchymal stem cells (NSCs) differentiation and related pathophysiology of skeletal and fat tissues. The mesenchymal cells are the main regulators of immune cells in the bone marrow and in fat tissue. The role of MSCs in aging and diseases is due to their capacity to convert into lipid-accumulating fat cells. Various pathways serve as cues in the niche regulating stem cell differentiation. The lab also uses mesenchymal stem cells (MSC) for various clinical applications such as immunomodulatory therapies and in cell replacement therapies application related to metabolic disease and tissue regeneration.

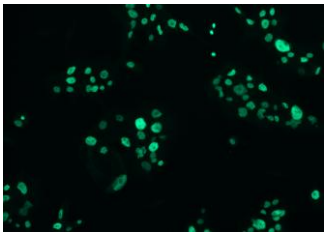


Prof. Broday, PhD, is at the Department of Cell and Developmental Biology at the Gray School of Medical Sciences. She obtained her PhD in Genetics from the Technion – Israel Institute of Technology and trained as a post-doctoral fellow at NYU Medical Center and Mount Sinai Medical Center, New York, NY. Prof. Broday's research focuses on cell biology during development and cancer and recently on the development of cancer diagnostic tools based on findings from her laboratory.

https://english.tau.ac.il/profile/broday

Development, Aging and Regeneration

Prof. Limor Broday



Post-translational modifications in development and cancer

Protein modifications by ubiquitin and ubiquitin-like proteins and their dynamic crosstalk with phosphorylation are essential for all cellular functions. De-regulation of such processes are a cause for many human diseases.

Prof. Broday's laboratory uses the nematode *C. elegans* to understand how post-translational modifications by SUMO, the Small Ubiquitin-like Modifier, are regulated. Her team's findings using the simple *C. elegans* SUMO system have been demonstrated by international research groups to be conserved in human and important in diseases such as intermediate filament–related disorders.

More recently, the Broday group uses patient-derived cancer cell cultures to study impaired phosphorylation processes initiated by oncogenic gene fusions with constitutive tyrosine-kinase activity, focusing on EML4-ALK, a known somatic driver in lung adenocarcinoma.

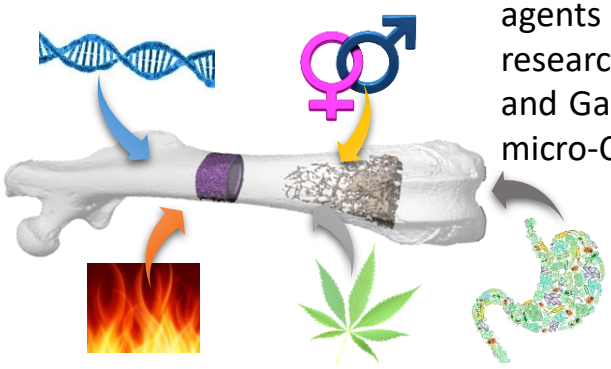
Prof. Gabet, DMD, PhD, is the Director of the Bone Research Laboratory in the Department of Anatomy & Anthropology in the Gray School of Medical Sciences. He completed his post-doctoral training at the University of Southern California. He has received several awards, including the ASBMR Young Investigator award. He serves as treasurer of the Israeli Society for Skeletal Biology and Medicine and was previously the Head of the Department of Anatomy & Anthropology. He is also a dentist, focusing on implantology and oral rehabilitation and a consultant and scientific advisor for companies in dentistry, orthopedics and cannabinoids.

Development, Aging and Regeneration

Prof. Yankel Gabet

Bone health & cannabinoids

Did you know that the skeleton is the largest organ by weight? Did you know that critical steps of immune cell development occur in the bone marrow? How do immune cells affect bone health? Can bone cells regulate our immune system? How can we suppress inflammation-induced bone destruction? Do specific strains of bacteria in our gut have an impact on the strength of our bones? Why do our bones weaken with age? Our main focus is on bone health and the crosstalk between bone and immune cells. Prof. Gabet developed unique models for the assessment of osteoporosis, inflammation-induced bone destruction and bone microarchitecture in response to modulations in the gut microbiota. The team's therapeutic approaches include cannabinoids, anti-inflammatory and bone anabolic agents that can modulate the bone-immune axis. The research spans from molecular biology to in vivo settings and Gabet has developed unique tools in 3D models using micro-CT.



Dr. Itkin, PhD, is in the Department of Pathology in the Gray School of Medical Sciences and the Sagol Center of Regenerative Medicine, with his lab at the Sheba Medical Center (SMC). Dr. Itkin completed his PhD and first postdoctoral training in Immunology and Stem Cells at the Weizmann Institute of Science, after which he continued to a second postdoctoral training and faculty position as Instructor of Biology in Medicine in New York Weill Cornell Medicine. Dr. Itkin was selected to participate in the Translational Research Training in Hematology (TRTH) program and received the American Society of Hematology (ASH) Achievement Award several times. Dr. Itkin is the first recruited Research Scholar of the Sagol Center for Regenerative Medicine. Itkin is the Director of Tel Aviv University's Neufeld Cardiovascular Research Institute at the SMC.

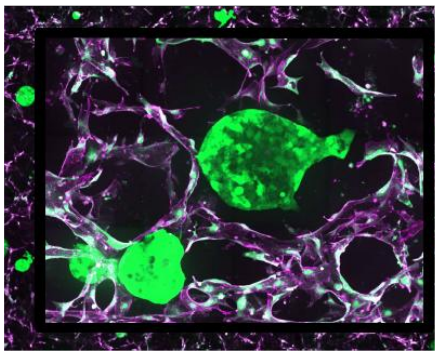
https://scrm.tau.ac.il/tomer_itkin

Development, Aging and Regeneration

Dr. Tomer Itkin

Cardiovascular regeneration

Dr. Itkin is focused on deciphering transcription factor-regulated genetic programs controlling fate choice decisions of cells in the cardiovascular and hematopoietic systems, heart, vessels, and blood, under homeostasis and disease in order to develop translational therapeutic strategies for tissue regeneration. For this goal he employs state-of-the-art microscopy imaging, flow cytometry sorting, and next-generation sequencing computational analysis methods. His basic research of the cardiovascular and blood systems in organ regeneration using genetic models is followed and supported by translational studies using vascularized human organoids. His research models allow screening of new therapeutic approaches promoting recovery and regeneration post injury or disease and the use of acquired knowledge to devise strategies to mitigate development of tumor malignancies.



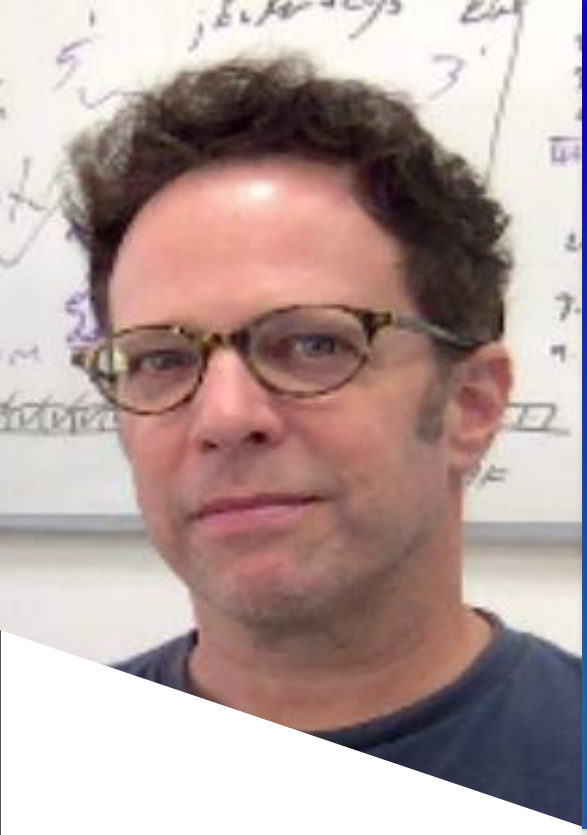
Dr. Benjamin Coyac, DMD-PhD, is a member of the School of Dental Medicine. He earned his dental and doctoral degrees from Paris Descartes University, specialized in periodontology at Rothschild Hospital, and completed a postdoctoral fellowship in plastic and reconstructive surgery at Stanford University. After making aliyah, he received his Israeli specialty in periodontology at Rambam Health Care Campus in Haifa. Benjamin Coyac has published peer-reviewed articles and book chapters in English, French, and Hebrew. Dr. Coyac has received several awards, including the 2021 André Schroeder Research Prize. He is a laureate of the French National Academy of Dental Surgery.

Development, Aging and Regeneration

Dr. Benjamin Coyac

Bone and tissue regeneration

Dr. Coyac focuses on the interplay between bone mineralization and tissue regeneration. He studies healing processes using a range of techniques and advanced animal models of dental procedures and rare bone diseases. Our skeleton and teeth are bio-rocks. They share the same mineral nature as all other geological crystals, but unlike gemstones, bones are specifically sculpted by proteins and molecules. This biological control over geology provides unique features that are seemingly contradictory, such as robustness and lightness, stability and remodeling. The Kovac laboratory investigates how these regulatory molecules impact bone formation and repair. Using models of rare bone diseases and advanced dental surgeries, they decipher molecular mechanisms underlying the interplay between biomineralization and each step of bone ossification. Based on mechanistic insight, they aim at developing clinically relevant strategies to overcome current limitations on bone regeneration.



Prof. Luxenburg, PhD, is in the Department of Cell and Developmental Biology in the Gray School of Medical Sciences. He completed his PhD studies in Molecular and Structural Cell Biology at the Weizmann Institute of Science. For his post-doctoral training, he trained at the laboratory of Prof. Elaine Fuchs at the Rockefeller University in New York. Prof. Luxenburg is the recipient of a number of research grants and awards, including the ISF, I-CoRE, BSF, ICRF, and the Teva Founders Prize. Prof. Luxenburg serves on the scientific board of the Israeli Society of Developmental Biology, Switzerland Institute of Developmental Biology. He is also the academic coordinator of the International Graduate program.

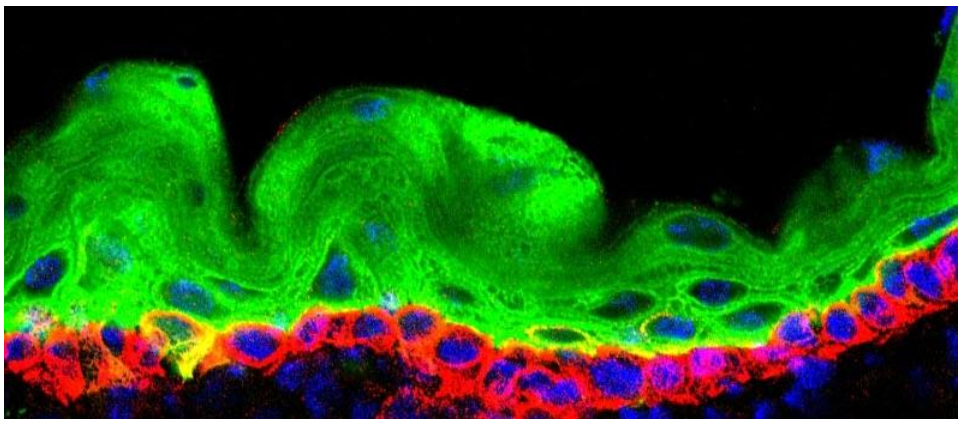
https://www.luxenburglab.com/

Development, Aging and Regeneration

Prof. Chen Luxenburg

Cytoskeletal regulation of epidermal stem cells

One of the significant challenges in biomedical research is to understand how stem cells give rise to functional tissue during development, maintain it throughout life, and regenerate it upon wounding. The Luxenburg lab studies how cytoskeleton-derived signals regulate stem cell function. The team uses the skin epidermis as their primary model system, and studies in the lab provide insight into both skin development and common skin diseases such as cancer and psoriasis.



Prof. Zaidel-Bar, PhD, is head of the Department of Cell and Developmental Biology at the Gray School of Medical Sciences and Vice Dean for Preclinical Research & Innovation of the Gray Faculty of Medical & Health Sciences. He completed his Ph.D. in Molecular Cell Biology at the Weizmann Institute and post-doctoral training at the University of Wisconsin - Madison. He started his independent group at the Mechanobiology Institute, National University of Singapore, where he was awarded the National Research Foundation Fellowship, and seven years later he joined Tel Aviv University. Zaidel-Bar is a world leader in the field of cell and tissue mechanobiology.

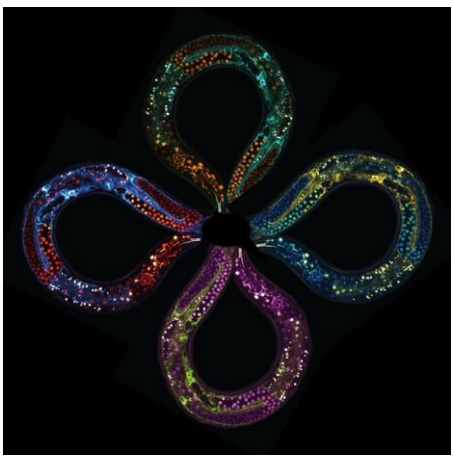
https://www.zaidelbarlab.com/

Development, Aging and Regeneration

Prof. Ronen Zaidel-Bar

Cytoskeletal regulation of morphogenesis

A developing embryo taking shape, a heart pumping blood, and a wound closing itself all rely on mechanical forces to accomplish their important tasks. A special cellular machinery, the cell's skeleton, is responsible for generating these forces, but how this machinery is assembled at the right time and place in our bodies remains poorly understood. Prof. Zaidel Bar's group is using cutting edge genetics and live-imaging microscopy in human and nematode models to gain a "front row seat" view of what the cytoskeleton is doing inside an animal. A better understanding of cytoskeleton regulation is important to prevent birth defects and to treat numerous diseases, such as asthma, hypertension, and cancer metastasis.



The germline of *C. elegans*. Germ cell nuclei and their surrounding basement membrane were labelled by fluorescent proteins and pseudocolored. Image by Priti Agarwal.

Dr. Danan-Gotthold, PhD, is in the Department of Cell and Developmental Biology at the Gray School of Medical Sciences. She completed her Ph.D. studies in Molecular Genetics at Bar Ilan University. For her postdoctoral studies, she joined Prof. Sten Linnarsson's lab at the Karolinska Institute in Sweden, specializing in the human brain and single-cell approaches. She continued for a one-year bridge position at the Weizmann Institute of Science. Dr. Danan-Gotthold's studies were supported by several prestigious grants and prizes, including the Azrieli Fellowship, EMBO Long-Term Scholarship, and the Council for Higher Education (VATAT) Program.

Development

Dr. Miri Danan-Gotthold

Elucidating the role of alternative splicing in human brain development

The fetal development of the human brain is a complex process that results in the formation of diverse brain cell types that are organized in precise spatial patterns. Any disruption in regulation of this process can lead to neurodevelopmental disorders such as Autism Spectrum Disorder or intellectual disability. Alternative splicing is increasingly recognized as a crucial regulatory mechanism in brain development, with specific splice variants and associated proteins playing essential roles in neuronal development. Dr. Danan-Gotthold combines computational analyses, single-cell approaches, and brain organoids to systematically investigate the role of alternative splicing in human brain development and related disorders. These insights are vital for identifying biomarkers and developing treatments for these devastating disorders.

Prof. Ofer Amir, PhD, is a speech pathologist at the Department of Communication Disorders, School of Health Professions. He received his Bachelor's and Master's degrees in Communication Disorders from Tel Aviv University and then completed his doctoral degree at the University of Illinois at Urbana-Champaign, USA. He is the former head of the Department of Communication Disorders at Tel Aviv University. In addition to his academic work, he runs a private practice for diagnosing and treating children and adults with fluency disorders and voice disorders. Prof. Amir is an active member of many local and international associations and professional committees.

www.oferamir.co.il

Development

Prof. Ofer Amir

Voice disorders and stuttering

Prof. Amir's research, teaching, and clinical work revolves around two major fields: voice disorders and disorders in speech fluency (i.e., stuttering).

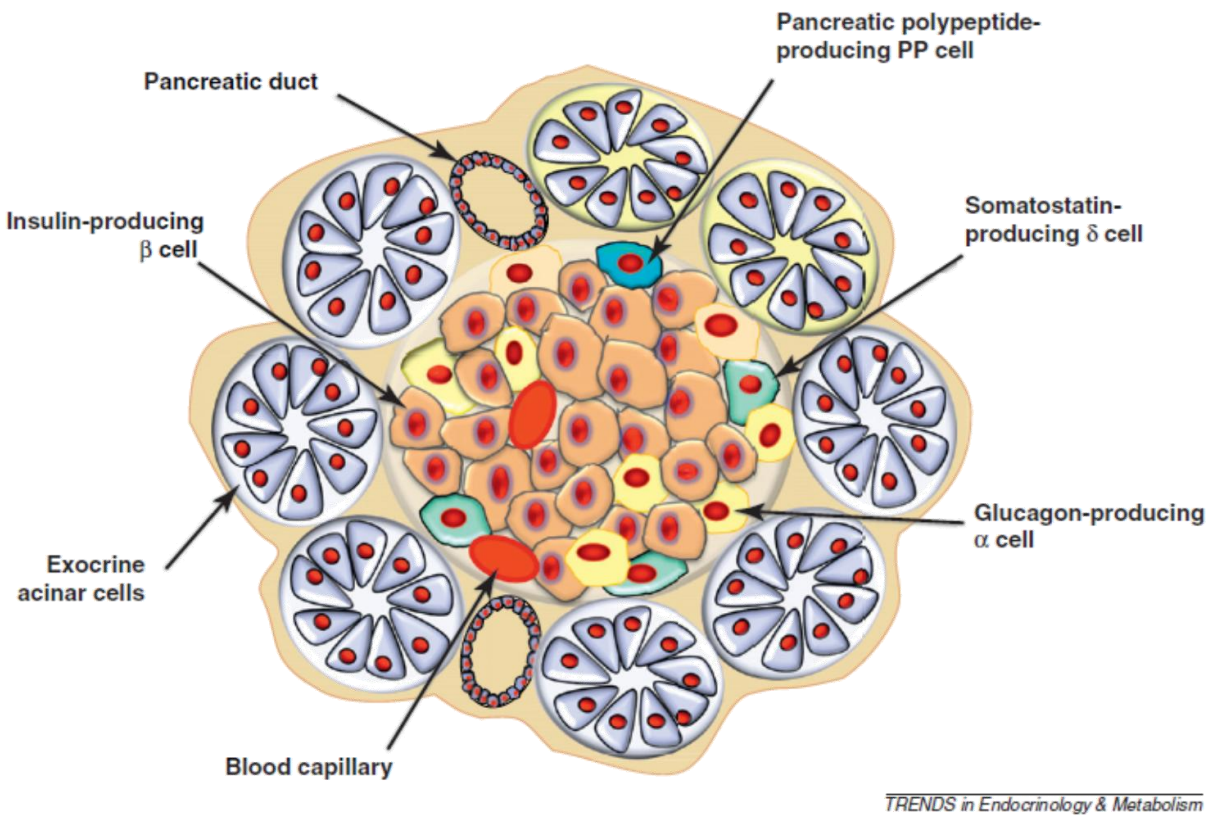
His research aims to bridge the gap between clinical work and theoretical research. For example, he developed many instruments for quantifying the individual self-reported voice handicap in adults and children. These instruments have become essential for voice evaluation in clinical and research settings. Recently, he presented a novel approach for arranging laryngeal pathologies and voice disorders. This new model challenges the traditional categorical approaches and suggests a two-dimensional continuous paradigm, that captures the complexity and multifactorial nature of voice disorders, hence facilitating a more holistic view of the field, clinically and theoretically.

Voice is a basic function of the human body, which is produced from birth, much before the development of language and cognition. Recognizing this unique capability, Prof. Amir's work over the years has also focused on identifying acoustic correlates of specific emotional and medical conditions that can be deciphered from voice recordings of various populations, both healthy and pathological.

Diabetes, Metabolic and Endocrine Diseases

One in 20 people in the world has diabetes, a chronic disease that occurs when the pancreas is unable to make insulin, or when the body becomes insensitive to this hormone.

This year marks the centenary of the discovery of insulin, which provided a life-saving treatment. However, most patients still develop severe long-term complications. Research is on for a cure, and for disease prevention.



Insulin-producing cells in the pancreatic islets

Prof. Landsman, PhD, is the head of the Pancreas Biology Lab in the Department of Cell & Developmental Biology at the Gray School of Medical Sciences. She graduated with honors from the Hebrew University of Jerusalem and obtained both her M.Sc. and Ph.D. degrees from the Weizmann Institute of Science. For her postdoctoral studies, she joined the laboratory of Prof. Matthias Hebrok at UCSF, a renowned expert in pancreas physiology and pathophysiology. Prof. Landsman has received grants from the ERC - Starting and Consolidator, the Israel Science Foundation, the EU Future and Emerging Technologies (FET), the European Foundation for the Study of Diabetes, and the German-Israeli Foundation. She was awarded the Hans Lindner Prize for Excellent Scientific Achievements by the Israel Endocrine Society.

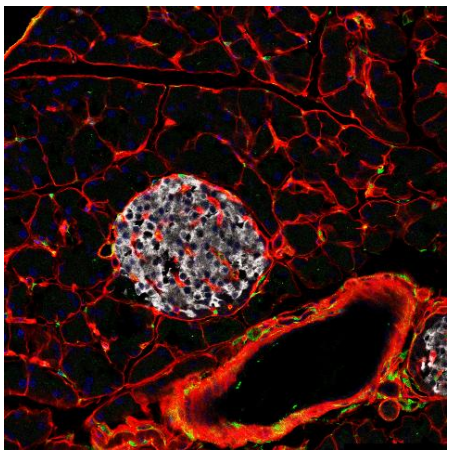
https://www.landsmanlab.sites.tau.ac.il/

Diabetes, Metabolic and Endocrine Diseases

Prof. Limor Landsman

Pancreatic microenvironment

Diabetes is now reaching epidemic proportions, yet our incomplete understanding of its etiology hinders the quest for a cure. Prof. Landsman studies the maintenance of proper pancreatic insulin production in healthy individuals and the mechanisms underlying its dysfunction in diabetes. Her research focuses on the crosstalk between insulin-producing beta cells and their microenvironment, particularly how this communication is disrupted by various diabetes risk factors. The primary objective of her work is to elucidate the fundamental causes of diabetes to enable the development of personalized therapeutic strategies.



Pancreas: White are insulin-producing cells; green and red cells marks the vasculature (Image: Eleonor Rachi)

Prof. Neumann, PhD, Department of Cell and Developmental Biology in the Gray School of Medical Sciences, completed her PhD at the Weizmann Institute and was trained as a postdoctoral fellow with Prof. Lodish at MIT. She set up and coordinated the EpoCan FP7 Consortium, which assessed the long-term risks of Epo and investigated better Epoetin-driven treatment modalities. She currently serves as Dean of Students at Tel Aviv University and holds the Lily and Avraham Gildor Chair for the Investigation of Growth Factors.

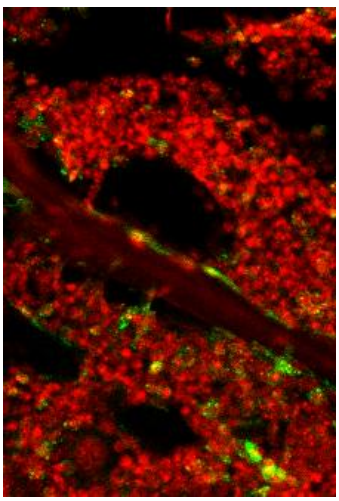
https://droritneumannlab.com/

Diabetes, Metabolic and Endocrine Diseases

Prof. Drorit Neumann

Osteoporosis

Anemia is a serious global health concern estimated to affect a third of the world's population. The introduction of erythropoietin (Epo) into clinical practice has revolutionized the treatment of this condition, although there is the risk of inadvertent effects that may be hazardous. Prof. Neumann has demonstrated that Epo is associated with a dual action of bone loss and immunomodulatory effects. Osteoporosis is the most common bone disease, affecting nearly half the population over the age of 50. Neumann's team studies Epo in mouse models and patients, in collaboration with bone experts and clinicians. Epo is a new player in osteoimmunology and will link the effects of the hormone to a wide range of outcomes on bone and immune cells, and suggest methods to realize the therapeutic potential of Epo, maintaining immune competence as well as the erythroid stimulating-effect while attenuating the risk for bone loss.



Deshet-Unger et al.
Theranostics 2020

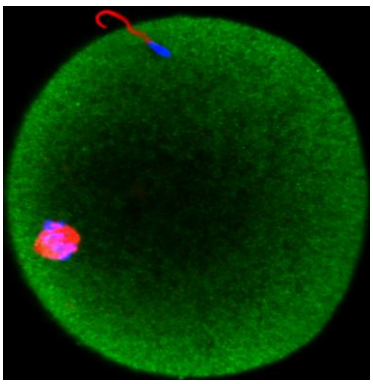
Prof. Shalgi , PhD, is a Professor Emeritus at the Department of Cell and Developmental Biology in the Gray School of Medical Sciences. She earned her Ph.D. at Tel Aviv University and completed her post-doc at the Population Council, Rockefeller University, NY. Throughout her career, she has held various leadership roles at TAU, including VP and Dean for Research, Dean of Students, Head of the Switzerland Institute for Dev Biol, Chairperson of IACUC, and Vice Dean for Preclinical Affairs. She has also served on numerous national and international boards and societies. Her research has been continuously funded by competitive grants from the ISF, BSF, ICA, ICRF, and the MOH. In recognition of her contributions to the field, she received the Israel Fertility Association's "Lifetime Achievement Award." Prof. Shalgi has been honored with the Outstanding Mentor Prize by the Israel Endocrine Society, as well as the Dean's Excellence in Teaching Award.

Reproductive Endocrinology and Physiology

Prof. Ruth Shalgi

Reproductive endocrinology and physiology

Mammalian females are born with a finite pool of oocytes for their lifetime. The majority will undergo atresia during development, with only a small fraction making it to ovulation. The oocytes reside within follicles, the functional units of the ovary, and are surrounded by granulosa cells (GCs), which provide them with somatic and endocrine support. Proper follicle development relies on intricate crosstalk between the oocytes and GCs, culminating in the ovulation of a high-quality oocyte capable of fertilization and embryo development. Molecular changes induced by factors such as aging, environmental insults, or cancer treatments, negatively affect oocyte quality and developmental potential. Prof. Shalgi's lab focuses on elucidating the oocyte and GCs activity affected by aging and chemotherapy and explores approaches to prevent oocyte damage. changes in their activity.



Human sperm within the oocyte stained for DNA (blue); and protein (Fyn kinase; green). Confocal microscopy .

Genomics and Precision Medicine

Affiliations

Safra Center for Bioinformatics

Single Cell Genomics Core

TAU-SCGC

Yoran Institute for Human Genome Research

Image credit: Uri Ben-David

Prof. Ast, PhD, is the head of the laboratory of Genome Medical Research in Rare Genetics Disorders and Cancer. He is a member of the Department of Human Molecular Genetics and Biochemistry, in the Gray School of Medical Sciences, the Sagol School of Neuroscience and the Edmond J. Safra Center for Bioinformatics. Ast is an EMBO member, Human Genome Organization member, the International Union Against Cancer Fellow, and head of the Israeli Society of RNA Biology, European Network of Excellence on Alternative Splicing member, and elected many times as 'Best lecturer' at the School of Medicine. Ast has mentored over 70 Ph.D. and M.Sc. students and postdoctoral fellows, 10 of whom now hold academic positions.

astlab.tau.ac.il

Genomics and Precision Medicine

Prof. Gil Ast

Alternative splicing & epigenetics in human disease

Prof. Ast's team has made several breakthroughs in the field of alternative splicing, revealing how the human genome obtained some of its unique characteristics, how chromatin structure and epigenetics can regulate the splicing reaction, and the links between alternative splicing and certain genetic disorders and cancer. Prof Ast currently focuses on the link between alternative splicing, epigenetic changes, and Hi-C in autism. His lab was the first in Israel and one of the first in the world to integrate computational biology and experimental bench work. His team's mastery of both bioinformatics and molecular biology approaches enables the multidisciplinary work that has led to their leading position in the field of RNA processing.

Prof. Avraham, PhD, is Dean at the Faculty of Medical and Health Sciences and holds the Drs. Sarah and Felix Dumont Chair for Research of Hearing Disorders. She heads the Laboratory of Neural & Sensory Genomics at the Department of Human Molecular Genetics and Biochemistry of the Gray School of Medical Sciences, the Sagol School of Neuroscience and the Safra Center for Bioinformatics. Avraham was awarded the Israel Science Foundation Breakthrough Research Grant, as well as NIH, ISF, BSF and GIF grants. She was co-director of the Aufzien Family Center for the Prevention and Treatment of Parkinson's Disease and the Healthy Longevity Research Center. Prof. Avraham founded and directs the MSc program in Medical Sciences / Genetic Counseling. She is an EMBO, CORLAS and HUGO member and was awarded the FISEB STAR Award for Scientific Excellence and Leadership and the international CORLAS Shambaugh Prize for Excellence in Otology Research.

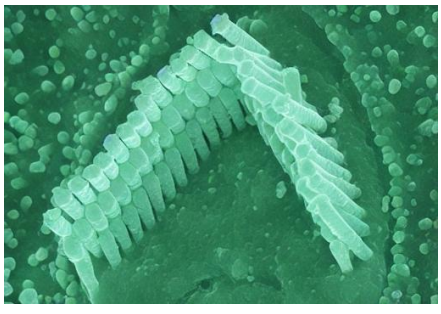
https://www.kbalab.com/

Genomics and Precision Medicine

Prof. Karen B. Avraham

Precision medicine & gene therapy for human disease

Prof. Avraham studies the genetic basis of disease, using genomic tools to address mechanisms leading to pathology, followed by gene therapy. These include deafness, epilepsy and developmental delay and CCHS. The lab addresses gene discovery, regulatory elements and gene therapy towards precision medicine for genetic disease. Hearing loss is a leading cause of disability worldwide, with over 50% due to genetic pathogenic variants in 200 genes. The team's work has demonstrated that genomic sequencing using high-throughput technologies is effective for genetic diagnoses in a diverse population, providing a guideline for precision medicine for hearing loss in Israel and worldwide. Drug repurposing and base editing is being applied to GRIN2D-associated epileptic encephalopathy. Antisense nucleotide therapy is being applied to CCHS, a deadline breathing disorder affecting children. The overarching goal is to work with clinicians to translate these discoveries to human genetic disease.



Hair cell treated with AAV gene therapy. Credit: Roni Hahn.

Prof. Gurwitz, PhD, is an Emeritus Professor at the Department of Human Molecular Genetics and Biochemistry of the Gray School of Medical Sciences, where he directs the National Laboratory for the Genetics of Israeli Populations (NLGIP). The laboratory was established by the Israeli Academy for Sciences and Humanities and serves as the National Biobank of Israel. Its collection of human DNA samples and cell lines is applied for numerous research projects on the human genome diversity. He is an editorial board member of several journals, including *Trends in Molecular Medicine*, *Genome Medicine*, *CNS Drugs*, and *Drug Development Research*.

Genomics and Precision Medicine

Prof. David Gurwitz

Precision medicine biomarkers for CNS disorders

Neurologic and mental disorders affect over 10% of the global population, with higher frequencies seen among the elderly. The anticipated graying of the human population makes the challenge of finding better personalized treatments for CNS disorders a priority. Prof. Gurwitz leads a team whose research is focused on the identification and validation of precision medicine biomarkers for diagnosis and treatment choice for CNS disorders, including Alzheimer's disease, major depressive disorder, bipolar disorder, and autism spectrum disorder. The team studies the effects of CNS disorders, and of their therapeutics, on the gene expression patterns of white blood cells from individuals with CNS disorders. The research approach has identified potential biomarkers and drug targets for patient-oriented CNS therapeutics.

Prof. Shomron, PhD, heads the Functional Genomic Team in the Department of Cell & Developmental Biology at the Gray School of Medical Sciences, after training at MIT. He leads a multidisciplinary team of scientists that develops computational methods for parsing big-data in the bio-medical field using Artificial Intelligence. Shomron is editor of the 'Deep Sequencing Data Analysis' book, Director of 'Rare-Genomics' Israel (NPO), Academic Director of 'ScienceAbroad' (NPO), and co-founder and Chief Scientific Officer (CSO) of Variantyx, which provides clinical interpretation of whole genome sequences.

http://www.tau.ac.il/~nshomron

Genomics and Precision Medicine

Prof. Noam Shomron

Genomics and human diseases

Our body is built from billions of cells. How each cell and organ interpret DNA is still a great puzzle. Understanding the molecular interactions within our cells, in health and disease, would greatly improve our ability to diagnose and treat complex human diseases, such as cancer and neurological disorders. Prof. Shomron and his team scan thousands of genes in order to pinpoint the ones that play a major role in tumor development and metastasis. His team has shown that by injecting nanoparticles with small molecules into the tumor the spread within the body is halted. In another study, using a simple blood test combined with artificial intelligence, the team has shown that circulating DNA and RNA molecules in the blood can indicate early development of neurological diseases, their stage, and the spectrum of the disease. This information could be used to devise a novel therapeutic approach.

Dr. Regev Schweige, PhD, is at the Department of Human Genetics and Computational Medicine at the Gray School of Medical Sciences, with a secondary affiliation at the Blavatnik School of Computer Science and AI. Regev earned his Ph.D. in Computer Science at Tel Aviv University and completed postdoctoral research in the Department of Genetics at the University of Cambridge with Prof. Richard Durbin, supported by an EMBO Postdoctoral Fellowship.

https://www.schweigerlab.org

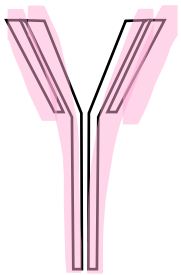
Human Molecular Genetics and Biochemistry

Dr. Regev Schweiger

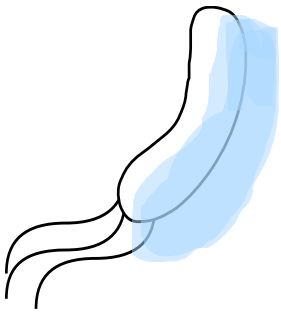
What shapes genetic variation?

Dr. Schweiger's research interests are in computational and population genetics, aiming to uncover the processes that shape genetic variation. To this end, the Schweiger Lab develops theory and algorithms that combine classical models in population genetics with modern machine learning and analyzes data from cutting-edge sequencing technologies. By integrating theory, algorithmic innovation, and large-scale genomic data, the lab decodes genetic variation to reconstruct the biological and evolutionary processes that generate it, from molecular mechanisms of recombination to patterns of diversity across individuals and species, advancing our understanding of evolution, human history, and health.

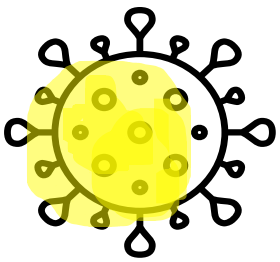
Infectious and Inflammatory Diseases



Chronic inflammatory diseases — including stroke, heart disorders, cancer, and diabetes — are the most significant cause of death worldwide (WHO)



Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi (WHO)



Infectious diseases are among the top 5 global causes of death (WHO)

Prof. Freund, PhD, is at the Department of Clinical Microbiology and Immunology in the Gray School of Medical Sciences. Her research focuses on human adaptive immune response towards diseases, such as HIV-1, Tuberculosis, SARS-CoV-2 and cancer. Before coming to Tel Aviv University, she completed her postdoctoral training at the Rockefeller University in New York City, where she led groundbreaking research on anti-HIV-1 neutralizing antibodies and proved their efficacy as novel HIV immunotherapeutics.

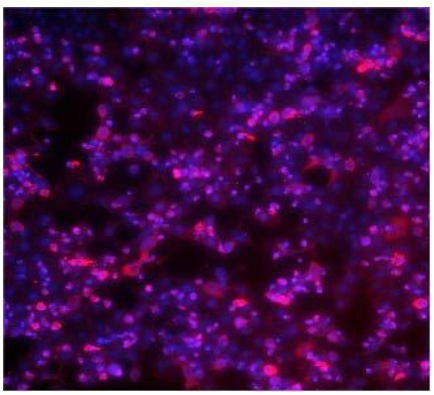
http://www3.tau.ac.il/nfreund/

Infectious and Inflammatory Diseases

Prof. Natalia Freund

Neutralizing antibodies

Neutralizing antibodies are a key component of adaptive immunity against many diseases and can be elicited by natural infection or vaccination. Recent studies showed that neutralizing antibodies are elicited following infection with viruses such as SARS-CoV-2, HIV-1 and Monkeypox. Moreover, antibodies that can inhibit the infection are formed in response to pathogenic bacteria, such as Mycobacterium *tuberculosis*. Prof. Freund's goal is to characterize the neutralizing antibody responses against these pathogens in humans by isolating neutralizing antibodies from infected donors and determining the mechanistic basis for their action. Additionally, she is interested in how auto-antibodies are formed in case of cancer and IBD and how the cells that produce antibodies, B cells, respond to various environmental stress and inflammation.



Vero E6 cells infected with SARS Coronavirus-2. Freund & Ben Croker, UC San Diego.

Prof. Gerlic, PhD, is head of the Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences. He obtained his PhD (Direct track) at Ben Gurion University, followed by a CCFA postdoctoral fellowship at Sanford Burnham Prebys Medical Discovery Institute (SBP), San Diego. Prof. Gerlic joined Tel Aviv University following a research officer position at WHEI & Melbourne University.

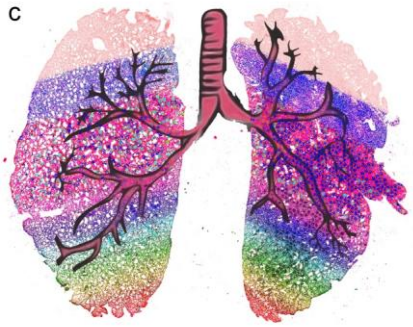
https://www.gerliclab.sites.tau.ac.il

Infectious and Inflammatory Diseases

Prof. Motti Gerlic

Cell death and disease

Cell death, an essential cellular process, facilitates the removal of damaged or infected cells, and is necessary for the resolution of immune responses. Cell death is long suggested to act as an innate immune response by killing infected cells to prevent dissemination of pathogens. Using animal models and genetics approaches, the Gerlic laboratory focuses on several projects including: Investigating the mechanisms of the inflammatory cell death pathways, necroptosis and pyroptosis, studying the immunological consequences of inflammatory cell death pathways during allergic and inflammatory disease in the skin, lung, liver and intestinal, studying the role of inflammatory cell death pathways during infectious diseases; and developing cancer immunotherapy based on non-apoptotic cell death. The Gerlic lab focuses on learning the mechanisms of necroptosis and pyroptosis to ultimately harness this knowledge to fight cancer and improve the health of infectious and inflammatory diseases patients.



Prof. Iraqi, PhD, at the Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences, completed his PhD at the Hebrew University in Jerusalem and three postdoctoral positions at University of Toronto, University of Michigan and the International Livestock Research Institute (ILRI).

Infectious and Inflammatory Diseases

Prof. Fuad A. Iraqi

Genetic basis of host response to diseases

People response differently to infection (viral, bacterial, fungal and parasite) and chronic diseases (obesity, diabetes, cancer, heart diseases). Based on Prof. Iraqi's and others' studies, this variation in response are controlled by the individual (host) genetic structure. Iraqi's team has studied, mapped and identified the host genetic components that control and define the individual response to variety of infectious and chronic diseases, including bacterial, fungal, viral, parasite, obesity, type 2 diabetes, periodontitis, lung cancer, and intestinal cancer. Currently, they also focus on studying the host genes that control the variation in response to COVID-19.

Prof. Kobiler, PhD, is at the Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences. Kobiler obtained his BSc from the Hebrew University in Medical Sciences. He received, in parallel, his MD and PhD from the Hebrew University. As a postdoctoral fellow at the Department of Molecular Biology at Princeton University, he received a Human Frontier Science Program (HFSP) Long Term Fellowship and the ISF Bikura Postdoctoral Award. He frequently appeared on the news to share a scientist's perspective on the COVID-19 pandemic.

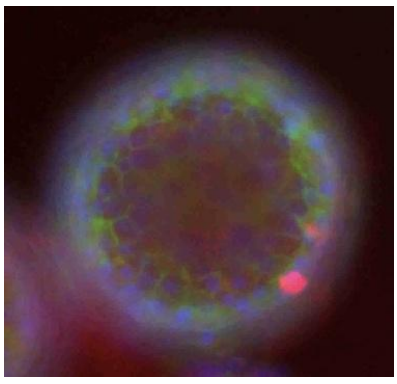
https://www.tau.ac.il/~okobiler/Home.html

Infectious and Inflammatory Diseases

Prof. Oren Kobiler

Organoid models

SARS-CoV-2 is a new emerging coronavirus that cause the COVID-19 global pandemic. The clinical manifestations among SARS-CoV-2 infected individuals vary from asymptomatic infection to acute respiratory failure and death. While SARS-CoV-2 share many features of the other human coronaviruses, it has become a major threat on global human health. By comparing basic infection processes of the seasonal coronaviruses to the SARS-CoV-2, Kobiler anticipates to identify the unique features of this virus. His team is establishing a model system for coronavirus infection of patient-derived airway organoids. The reproducibility of the model system will allow the team to test and identify the role of specific parameters of the SARS-CoV-2 infection, and to test possible drugs.



Prof. Munitz, PhD, is at the Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences. He obtained a BSc in Medical Science and direct PhD in Pharmacology at Faculty of Medicine at Hebrew University. His post-doctoral training was at the Division of Allergy and Immunology at Cincinnati Children's Hospital Medical Center, Ohio. Munitz was awarded the Alon Fellowship, the Teva Medicine Award for Outstanding Research, the Eva and George Klein Award by the Israel Science Foundation, the Tel Aviv University Rector Award for Outstanding Teaching Achievements and the Dean Prize for Excellent Teaching Skills. He is a board member of the International Eosinophil Society.

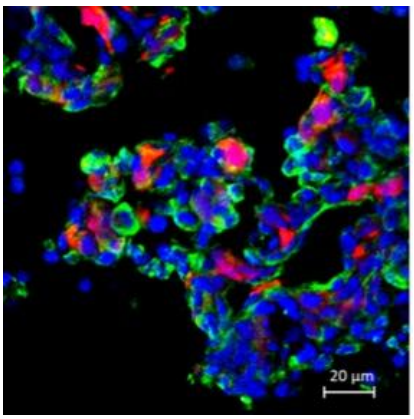
www.munitzlab.com

Infectious and Inflammatory Diseases

Prof. Ariel Munitz

Immunity in health and disease

Type 2 immunity occurs during allergic diseases or infection with parasites. Emerging data highlight new roles for Type 2 immune responses in metabolism, tissue regeneration and cancer. The Munitz team aims to define the roles of cells and proteins that are "traditionally" associated with allergy in additional chronic inflammatory diseases and the tumor microenvironment. Their main research aim is to define how eosinophils, white blood cells, operate in settings of allergy and cancer. How and when do eosinophils recognize tumor cells? Do resident and recruited eosinophils act differently in the tumor microenvironment? Are the opposing activities of eosinophils dictated by heterogeneity of these cells in distinct microenvironments? Finally, can eosinophils be therapeutically targeted as a new cellular target in the cancer? Answering these questions will introduce a conceptual shift from allergy to tumor biology providing cross-disciplinary understandings of the tumor microenvironment that can be translated into novel immunotherapy.



Prof. Osherov, PhD, is at the Department of Clinical Microbioloy and Immunology at the Gray School of Medical Sciences and holds the Chair for the Ella Kodesz Institute for Host Defense. He completed his PhD studies at the Hebrew University of Jerusalem and his post-doctoral training at the Baylor College of Medicine and MD Anderson Cancer Center in Houston, Texas, USA. Osherov heads the Joint BSc Program in Medical and Life Sciences.

www.tau.ac.il/~nosherov/index.html

Infectious and Inflammatory Diseases

Prof. Nir Osherov

Fungal diseases and novel treatments

Every year, over 1.5 million people die worldwide from fungal infections. These numbers are increasing fast because of the growing number of at-risk immunocompromised patients. Worryingly, fungi are developing resistance to our top antifungal drugs. One of the most dangerous and common fungal infections, called Invasive Aspergillosis, is caused by the green mold Aspergillus fumigatus. It is commonly found in decaying vegetation, producing airborne spores that can infect the lungs. The Osherov lab uses cutting-edge molecular techniques to study how this fungus infects the lungs and how it develops resistance to antifungal drugs. They develop new drugs that take advantage of its weaknesses. This work is contributing to better understanding and treatment of a surprisingly common and lethal fungal infection.

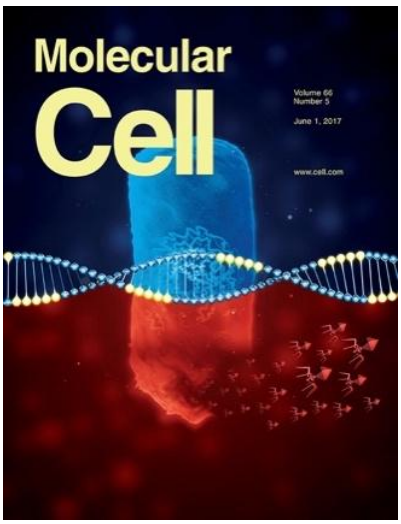
Prof. Qimron, PhD, is at the Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences. He has authored over 50 scientific articles, some in prestigious journals such as Nature, Science, and Cell. He won the prestigious ERC grant twice. He is also the CTO of a company established based on his inventions, Trobix-Bio. https://flaxadam.wixsite.com/qimronlab

Infectious and Inflammatory Diseases

Prof. Udi Qimron

CRISPR-Cas for bacterial resistance

Bacterial resistance to antibiotics is among the top three major health threats according to the World Health Organization. Rather than producing more antibiotics, which may worsen the problem, we have taken a unique approach, in which we reverse bacterial resistance to antibiotics. Prof. Qimron's approach uses the genetic engineering tool, CRISPR-Cas, to eliminate resistance genes from bacteria, and at the same time to enable growth of antibiotic-sensitive bacteria.



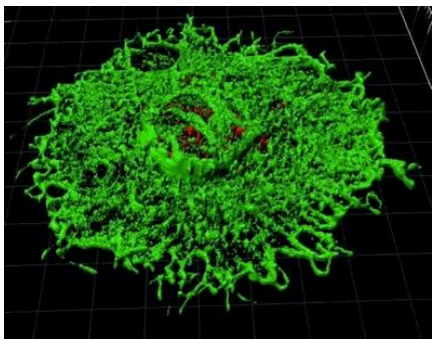
Prof. Sagi-Eisenberg, PhD, holds the Herczeg Memorial Chair of Argentine Friends on Allergy and Related Diseases and was head of the Graduate School for Advanced Degrees. She is a Professor Emeritus of the Department of Cell and Developmental Biology at the Gray School of Medical Sciences and the Sagol School of Neuroscience. She completed her PhD at Tel Aviv University and trained at the Weizmann Institute of Science and at the National Institutes of Health in the US. Sagi-Eisenberg is an elected member of the Collegium Internationale Allergologicum (CIA) and member of the European Mast Cell and Basophil Research Network (EMBRN). Her research is funded by grants awarded by the Israel Science Foundation, the U.S.-Israel Binational Science Foundation and the Israel Ministry of Science and Technology. Sagi-Eisenberg was awarded the Dean Prize for Excellent Teaching Skills.

https://rselab.wixsite.com/mysite

Infectious and Inflammatory Diseases

Prof. Ronit Sagi-Eisenberg

Allergic diseases



Allergic diseases have reached epidemic proportions, affecting more than 30% of the world population. Yet, allergy treatment is still largely symptomatic. Mediators cause allergic symptoms when mast cells are triggered by an allergen, but they also play a significant role in the progression of neurogenic inflammation and chronic inflammation, when mast cells are activated by neurotransmitters or neighboring cells, as is the case of neurodegenerative diseases and cancer. The Sagi-Eisenberg lab combines functional genomics analyses with high resolution microscopy to delineate the secretory response of mast cells during allergic, neurogenic and tumorigenic activation. The goal is to identify the protein networks that control these processes. Central proteins are marked as targets for the development of novel therapeutic means aimed at targeting the pathological activity of mast cells during disease.

Prof. Salomon, PhD, is at the Department of Clinical Microbiology and Immunology at the Gray School of Medical Sciences. He completed his PhD (direct track) at Tel Aviv University, followed by a Postdoctoral fellowship at the University of Texas Southwestern Medical Center. Prof. Salomon was awarded the NIH Pathway to Independence Award (K99/R00) and was also awarded the Alon Fellowship for young investigators and the prestigious European Research Council (ERC) starting grant. During the period of the COVID-19 quarantine, he pioneered the organization of virtual international conferences. Prof. Salomon is an elected board member of the Israel Society for Microbiology. He is also a member of the international Vibrio organizing committee, in charge of the bi-annual meetings of Vibrio researchers from around the world.

https://www.dorsalomonlab.sites.tau.ac.il/

Anthropology and Ancient DNA

Prof. Dor Salomon

Bacterial toxins and antibacterial treatments

The World Health Organization predicts that by 2050, multidrug-resistant pathogens will become the leading cause of death worldwide. To prevent this catastrophe, the development of novel antibacterial treatments is necessary. Prof. Salomon is employing multi-disciplinary approaches to study mechanisms and toxins that are used by bacteria to neutralize their bacterial competitors. By adapting and custom-engineering these natural antibacterial mechanisms, Prof. Salomon is developing next-generation antibacterial treatments and prophylactics. In addition, Prof. Salomon's research focuses on identifying and investigating virulence toxins used by bacteria to colonize animal hosts and cause disease.

Prof. Ella Sklan, PhD, is at the Department of Clinical Microbiology and Immunology in the Gray School of Medical Sciences. Sklan obtained her Ph.D. in Biological Chemistry from the Hebrew University of Jerusalem and trained as a post-doctoral fellow at the Department of Gastroenterology and Hepatology at Stanford University.

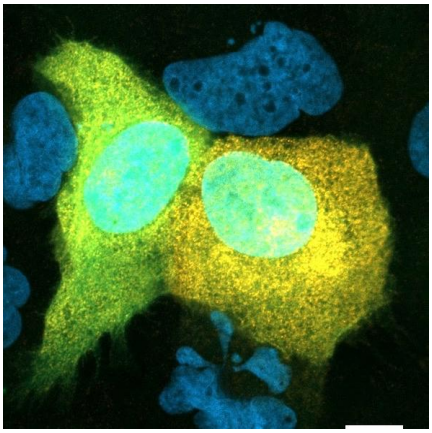
https://www.sklanlab.sites.tau.ac.il/

Anthropology and Ancient DNA

Prof. Ella Sklan

Novel anti-viral drugs

RNA viruses are major pathogens affecting the lives of millions worldwide. Prof. Sklan's primary goal is to better understand the interactions of these pathogens with their host cells using RNA viruses from different families as models. Her team employs genome-wide genetic screens to identify host factors affecting viral propagation and study the underlying mechanisms. In addition, they are trying to understand how some of these viruses overcome the innate host defenses. The hope is that a better understanding of these molecular mechanisms will contribute to the identification of novel anti-viral drugs.



Cells expressing a Sandfly virus protein

Dr. Livnat Afriat-Jurnou has joined the Department of Oral Biology at The Goldschleger School of Dental Medicine, Faculty of Medical & Health Sciences, as a Senior Lecturer. She holds a BSc in Chemistry and Biology from Tel Aviv University, and her MSc and PhD studies at the Weizmann Institute of Science focused on enzyme evolution. After completing a postdoctoral fellowship at the Australian National University, she became a group leader at the Migal Research Institute in Upper Galilee and later a Senior Lecturer at Tel Hai College. Additionally, Dr. Afriat-Jurnou is a board member of The Israel Society for Microbiology.

Infectious and Inflammatory diseases

Dr. Livnat Afriat-Jurnou

Microbial Communication and Enzyme Solutions

Her research focuses on the fascinating realm of enzyme evolution, delving into the mechanisms by which enzymes acquire new functions. She specifically examines enzymes that disrupt microbial communication, particularly through the process of quorum sensing, while also exploring the enzymatic mechanisms that govern inter-kingdom interactions between fungi and bacteria. Additionally, her work employs protein engineering to customize enzymes for innovative applications, including the degradation of xenobiotics and the development of cutting-edge antimicrobial strategies.

Ethics, Biomedicine and Policy

Affiliations

Bioethics and Law Center

Samueli Initiative for Responsible AI in Medicine

Dr. Asman, LLD, is a member of the Department of Nursing at the School of Health Professions. He is the founder and co-director of the Bioethics and Law Center and the Director of the Samueli Initiative for Responsible AI in Medicine at Tel Aviv University. His doctorate at the Hebrew University focused on mental competence in Israeli law, both in Rabbinical and Shar'i courts. His role as Chair of The Ethics Committee at the Geha Mental Health Center and of District Psychiatric Committees in other Mental Health Centers inspires some of his research projects and collaborations. He is a member of the Harvard Project on Disability and the Harvard Program in Psychiatry and the Law.

https://www.asmanlab.com/

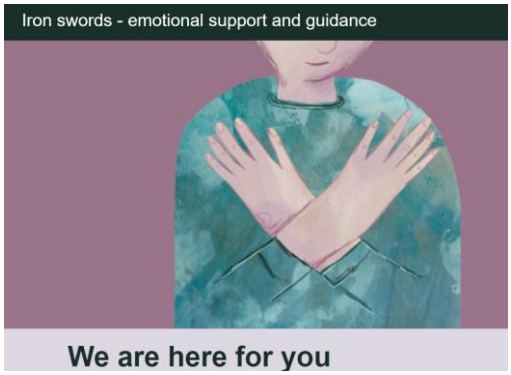
Medical Ethics, Biomedicine and Policy

Dr. Oren Asman

Bioethics, Policy and Mental Health

Ethical conflicts and dilemmas in medicine require a nuanced and adaptive approach, such as the one provided by the insightful, multi-disciplinary bioethical perspective on how new medicines, procedures and technologies could be morally, ethically and legally addressed and considered. Conceptual and normative discussions may inform practice, clinical research, as well as health and public health policies on moral status, end of life decisions, autonomy and decisional capacity, healthcare professional commitments and patients' rights.

Dr. Asman's Interdisciplinary Lab's current projects include developing guidelines for responsible adoption of Generative Artificial Intelligence (AI) in the Mental Health Rehabilitation system and identifying and mitigating potential algorithmic bias in the Israeli Health care setting. Following the October 7th attack on Israel, together with Prof. Yael Lahav, GAIA, an online system for Prevention and Reduction of Post-Traumatic Distress was developed in order to provide an ethically guided support tool for people in distress.



Dr. Segev, PhD, RN, is in the Department of Nursing in the School of Health Professions. He earned his BA, MA, and PhD from Tel Aviv University and his post-doctoral training from the Ben Gurion University of the Negev. Dr. Segev has clinical experience from the Department of Nephrology at the Hasharon Hospital of the Rabin Medical Center. He has more than ten years of experience in teaching nursing at the Ruppin Academic Center. He is focused on Medical Education and the history of nursing and health professions, chronic patients, and health and multicultural societies' research.

Medical Education, Ethics and History

Dr. Ronen Segev

Israeli first decades' immigrants and kidney stones: What can be learned from history?

During the 1950s, the incidence of kidney stones in Israel was 11.6 per 1000, significantly higher than the incidence in the "Stone Belt" of Florida, USA (0.947 per 1000). This high rate was particularly interesting considering the characteristics of the newly founded young nation, which spanned only 20,600 square miles. Israel was also characterized by a variety of climate types (hot and dry weather in the Jordan Valley, temperate and wet in the north, and warm and dry in the south), and an ethnically diverse new immigrant population that was facing changes of profession and exposure to new climate conditions. The relative incidence of stones among Jewish persons from Asian regions patients was only 0.6 compared to among Ashkenazi Jewish originally from European regions. Genetic, nutritional, and climate explanations for the phenomenon were ruled out. In 1966, behavioral habits were found to be the main factor causing this phenomenon. The research team had to understand this phenomenon and the need to encourage new drinking habits among immigrants arriving in the warm country of Israel from cold climate countries. Their studies identified the need for preventative measures and developed health education methods to prevent stone formation.

Dr. Gutentag, PhD, MBA, is a faculty member in the Department of Medical Education in the Gray School of Medicine. Dr. Gutentag completed her BA, MA, PhD, and MBA, all *magna cum laude*, at the Hebrew University of Jerusalem. She completed her post-doctoral training in educational psychology at the Hebrew University, and in psychology at the University of Toronto and at the University of Melbourne.

Medical Education, Ethics and History

Dr. Tony Gutentag

The psychology of medical education

Dr. Gutentag studies social and emotional aspects in education in general, and in medical education in particular. For example, in what way can we help physicians to be more empathic toward their patients? How can we attenuate burnout among healthcare professionals? Can we improve medical students' learning by using academically productive talk?

Dr. Gutentag's research is interdisciplinary, combining psychology, organizational behavior, education, and psychometrics, and uses multi-method (e.g., experiments, surveys, experience sampling).

Prof. Karnieli-Miller, PhD, is at the Department of Medical Education at the Gray School of Medicine. She received her PhD in Social Work from Haifa University in Israel with a specialty in communication in healthcare. She completed a post-doctoral fellowship at the Regenstrief Institute at the Indiana University School of Medicine, focusing on professionalism and humanism in healthcare. Prof. Karnieli-Miller has been awarded numerous significant research grants and has published widely in leading peer-reviewed journals within the field of medical education and communication in healthcare.

Medical Education, Ethics and History

Prof. Orit Karnieli-Miller

Humanist care

One of the challenges physicians face is managing difficult conversations, including breaking bad news. These conversations require high-level capabilities to identify different patients' needs, share information in a tailored manner, and address patients' emotions with empathy. Prof. Karnieli-Miller explores these challenging encounters from patients, family members, and physicians' perspectives. Her research focuses on understanding participants' needs and developing physicians' skills. Prof. Karnieli-Miller, as the director of communication skills training, studies and publishes how to teach communication skills, including developing a revised protocol on how to break bad news. She also identified physicians' personal and professional challenges and created a reflective practice protocol to prepare for these encounters. Furthermore, Prof. Karnieli-Miller explores the medical culture and focuses on its impact on medical students' identity formation. Her studies focus on enhancing students' moral courage to speak up when faced with professionalism and patient safety breaches to enhance humanistic, compassionate, and trustworthy medical care.

Dr. Warshawski, PhD, RN, at the Department of Nursing, School of Health Professions, is a registered nurse and holds a post-basic professional license as a Pediatric and Preterm Intensive Care Nurse. Dr. Warshawski received her Master's degree in Nursing from Tel Aviv University and a PhD in Health Sociology from Ben-Gurion University. Her doctorate was one of the first in Israel that focused on Interprofessional collaboration between healthcare teams in hospitals. She is active internationally in nursing education and collaborates with nursing educators in academic institutions worldwide exploring new and creative approaches for teaching nursing.

Rehabilitation and Educational Training

Dr. Sigalit Warshawski

Nursing education and advanced technologies

Nursing education has undergone significant changes in its training programs for several decades with the purpose of ensuring quality care and adjusting to organizational and technological changes in healthcare systems. Dr. Warshawski employs both quantitative and qualitative methods to explore nurse and nursing students' roles in leading the therapeutic process. As such, examining their training and skills during their studies is crucial. Understanding students' needs and competencies accompanied by the integration of novel teaching methods may improve students' learning experience, confidence, and professional skills. These may bring about improved treatment outcomes. Dr. Warshawski is part of a research project at the School of Health Professions that is developing interprofessional courses for students and exploring interprofessional skills and attitudes among health profession students in Israel.

Nervous System and Brain Disorders

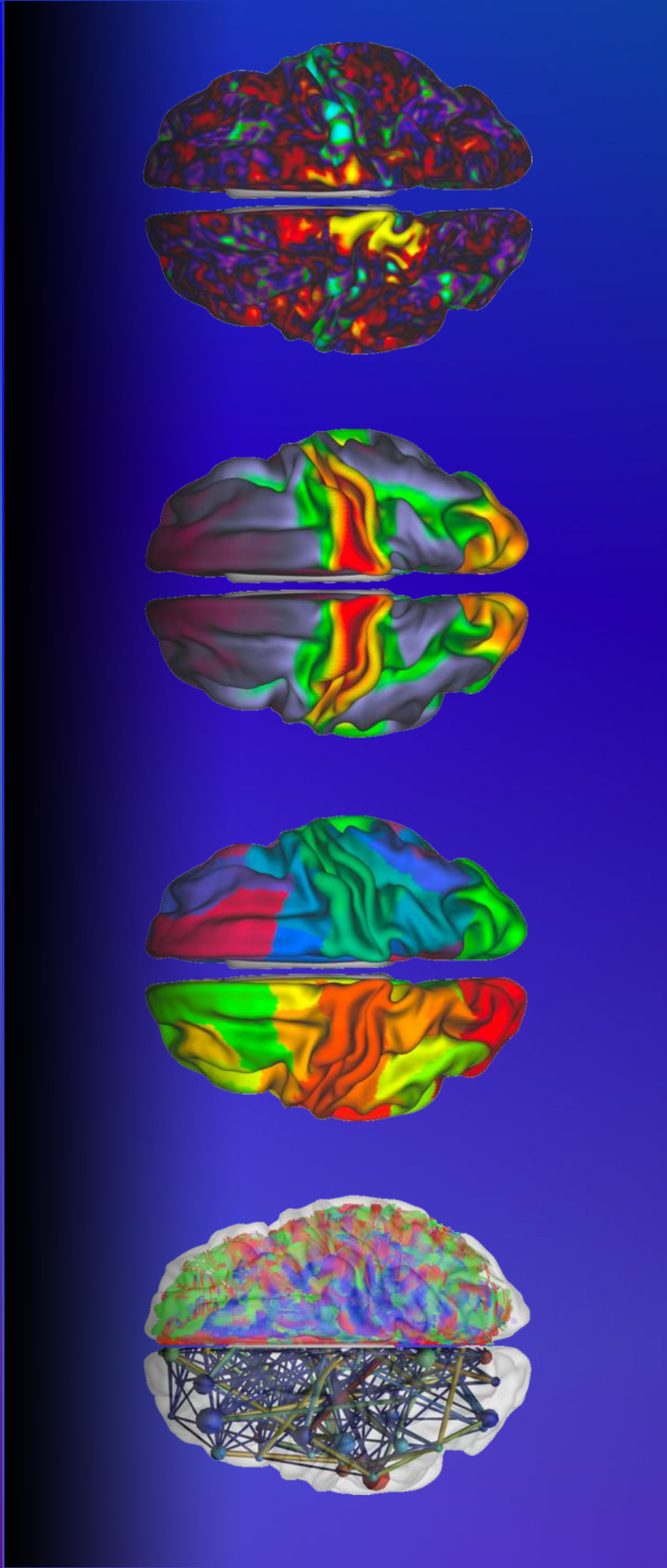
Affiliations

Sagol School of Neuroscience

Aufzien Family Center for the Prevention and Treatment of Parkinson's Disease

Goldschleger Eye Research Institute

Institute for Psychedelic Research



From left to right: Structural brain connectivity, extracted from diffusion MRI scans; Parcellation of the human cortex, based on functional connectivity; Myelin map (calculated from T1w/T2w MRI scans); Brain activation map extracted from functional MRI, while moving the right foot. Ido Tavor.

Prof. Ashkenazi, PhD, is at the Department of Cell and Developmental Biology at the Gray School of Medical Sciences and Sagol School of Neuroscience. He completed his PhD at the Weizmann Institute of Science and his postdoctoral training at Cambridge University. He was awarded the Young Investigator Award by the European Biochemical Society and the Azrieli Fellowship for excellent new faculty in Israel. He is part of the Taube-Koret Global Collaboration in Neurodegenerative Diseases. He was awarded the Neurotoxin Exposure Treatment Parkinson's Program Early Investigator Research Award by the US Department of Defense and the Aufzien Family Center Parkinson's Disease Junior Scientist Prize.

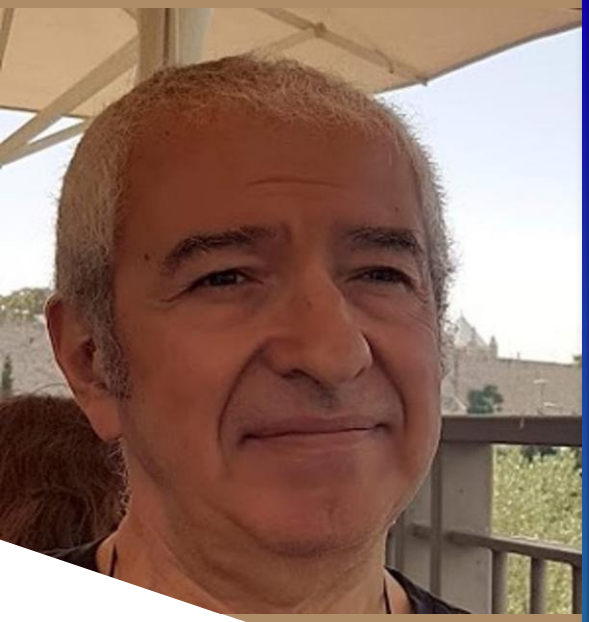
https://www.ashkenazilab.com/

Nervous System and Brain Disorders

Prof. Avraham Ashkenazi

Autophagy in Huntington and Parkinson's disease

Prof. Ashkenazi's long-term scientific goal is to identify mechanisms that contribute to neuronal survival. To achieve this goal, his laboratory combines stem cell technology, primary neurons, animal models, and biochemical and cellular approaches. Dr. Ashkenazi's pioneering work on autophagy (self-eating) revealed how this cell survival pathway breaks down protein clumps (aggregates) and reduces toxicity in models of triplet repeat expansion diseases, such as Huntington's and Parkinson's disease. He was the first to describe a biological function of triplet repeats encoding polyglutamine stretches in regulating autophagy in health and in Huntington's disease. Dr. Ashkenazi's research opens several new venues of understanding protein degradation pathways and the biology of neurodegenerative diseases. Moreover, his research has the potential to reveal new druggable targets that can be utilized to control a range of neurological disorders caused by aggregate-prone proteins.



Prof. Attali, PhD, is a Professor Emeritus at the Department of Physiology and Pharmacology in the Gray School of Medical Sciences. He was educated in France and received a BSc/MSc in Chemistry and PharmD from Paul Sabatier University (Toulouse). He obtained his PhD in Neurobiology from the Weizmann Institute of Science and performed his post-doctoral training at the National Centre for Scientific Research (CNRS) in France.

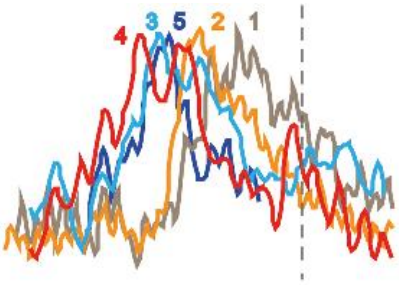
https://attalilab.com/

Nervous System and Brain Disorders

Prof. Bernard Attali

Channels in disease

Prof. Attali focuses on potassium channels since they play crucial roles in many cellular functions such as shaping cardiac and neuronal action potentials, tuning neuronal firing patterns, synaptic integration or modulating neurotransmitter release. Using the powerful combination of molecular biology, biophysics, biochemistry and electrophysiology, his team's research aims at elucidating the structural, biophysical and physiological attributes of potassium channels in human brain and heart. His laboratory is a worldwide leader in studying Kv7 potassium channels, whose mutations lead to major neurological and cardiovascular disorders such as epilepsy, myokymia, atrial or ventricular fibrillation. Notably, he showed that SK4 Ca2+-activated K+ channels are involved in the cardiac pacemaker activity and represent new targets for cardiac arrhythmias.



Dr. Bar-Shalita, PhD, Department of Occupational Therapy at the School of Health Professions, completed her PhD at the Hebrew University of Jerusalem and her postdoctoral training at the University of Southern California. She is actively translating the knowledge evolved in her lab to the clinical field.

Nervous System and Brain Disorders

Dr. Tami Bar-Shalita

Sensory modulation dysfunction

We all share the same physical environments, yet for some of us these severely attenuate our efficient function and well-being. This condition is termed sensory modulation dysfunction (SMD), characterizing about 10% of the general population. Dr. Bar-Shalita is the first to apply a unique approach by the coupling of sensory and pain domains using neurophysiology and psychophysical methods. Through this approach, Dr. Bar-Shalita found that SMD is linked to disorders such as substance use disorder and chronic pain, which further served developing novel mechanism-based therapeutic modalities, currently under testing.

Dr. Bart, PhD, is a faculty member at the Department of Occupational Therapy in the School of Health Professions. She holds a PhD in health professions and performed her post-doctoral training at Haifa University. She was previously head of the Department of Occupational Therapy. Bart is a member of the International Advisory Council for Children with Developmental Coordination Disorder (DCD) and of the Israeli Association of Occupational Therapy and the American Occupational Therapy Association.

Nervous System and Brain Disorders

Prof. Orit Bart

Autism spectrum disorder

Children with autism experience stress in diverse life situations. The most common stress provoking situations are engagement in social interaction and exposure to tactile stimuli. Dr. Bart aims to assess brain engagement during different play settings (solitary play vs. dyadic play) and during exposure to different tactile stimuli (direct - physiology vs. indirect - cognitive) in children with autism. This is a step towards a better understanding of the physiological and cognitive-emotional mechanism underlying atypical sensory responsiveness and social interaction. To overcome the challenge of assessing young children with autism, Dr. Bart uses an electro-physiological marker for sustained attention, the Brain Engagement Index, which is an easy-to-use, reliable, and valid tool.

Dr. Darshan, PhD, is a member of the Department of Physiology and Pharmacology at the Gray School of Medical Sciences and the Sagol School of Neuroscience, as well as affiliated with the School of Physics and Astronomy of the Faculty of Exact Sciences. Darshan holds a BSc in Physics and Biology from the Hebrew University, where he participated in the 'Amirim' special honors program for Exact Sciences and the 'Etgar' honors program for Life Sciences. He pursued a PhD in theoretical and computational neuroscience at the Hebrew University, focusing on developing theories of learning and dynamics of neural networks. Following the completion of his doctorate, Dr. Darshan established his own theoretical lab as a fellow researcher at Janelia Research Campus, HHMI.

https://darshanlab.sites.tau.ac.il/

Nervous System and Brain Disorders

Dr. Ran Darshan

Shaping cognitive behaviors

Dr. Darshan is a theoretical neuroscientist, employing computer simulations and the use of mathematical tools to unravel how our brain works. His research draws from the realms of statistical physics, theory of nonlinear dynamics and machine learning, as he constructs and studies mathematical models of neural circuits and develops innovative tools for analyzing neural data. His primary goal is to understand how cognitive abilities emerge from the collective activity of neurons at the network level, and how such activity evolves during the process of learning. Spanning a wide range of neuroscience domains, his work delves into topics including learning, memory, motor preparation, and decision-making processes within the brain. His lab will work closely with experimentalists, forging a collaborative effort to reveal the mechanisms underlying these cognitive brain processes.

Prof. Eldar-Finkelman, PhD, holds the Lady Davis Chair in Biochemistry at the Department of Human Molecular Genetics & Biochemistry in the Gray School of Medical Sciences. She is head of the School of Graduate Studies. Prof. Eldar-Finkelman obtained her BSc in Chemistry from the Hebrew University of Jerusalem, and her MSc in Physical Chemistry and PhD in Life Sciences at the Weizmann Institute. Her postdoctoral work was conducted with the Nobel Prize Laureate Edwin G. Krebs at the University of Washington in cell signaling. She then became an Assistant Professor at the Harvard Medical School in the Division of Women's Health and then joined TAU. Eldar-Finkelman was awarded Distinguished Scientist of the Israeli Association of Diabetes and the Hans-Linder Prize of the Israeli Endocrinology Society. She is part of the Taube-Koret Global Collaboration in Neurodegenerative Diseases.

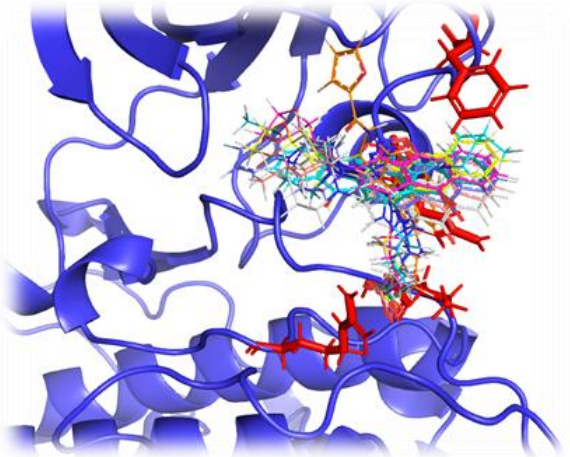
https://www.heflab.sites.tau.ac.il/

Nervous System and Brain Disorders

Prof. Hagit Eldar-Finkelman

GSK-3 inhibitors in treating neurodegeneration

The research in Prof. Eldar-Finkelman's laboratory is focused on understanding the signal transduction mechanisms contributing to human diseases, particularly in the context of protein kinases and neurodegenerative disorders. Her focus is on the protein kinase, GSK-3, as a prominent drug target for treating neurodegeneration. Her team combines expertise in chemistry, biology, and computational modeling to design drugs with unique inhibition modality. An important aspect of the work is the development of their platform "from peptides to small molecules" for rational discovery and design of protein kinase inhibitors that bind the substrate binding site of the enzyme.



Designed molecule inhibitors bound to GSK-3

Dr. Finkelstein, PhD, is in the Department of Physiology & Pharmacology in the Gray School of Medical Sciences and is affiliated with the Sagol School of Neuroscience. He completed his PhD studies at the Weizmann Institute of Science and his postdoctoral training at Janelia Research Campus (Howard Hughes Medical Institute, USA). Dr. Finkelstein is a recipient of several awards including the Wolf Foundation award, Clore Foundation fellowship, the John F. Kennedy Prize (Weizmann Institute of Science), FENS-Kavli Network of Excellence PhD Thesis Prize, Young Investigator Award and the Capranica Prize from the International Society for Neuroethology, EMBO Long-Term Fellowship, Rothschild Fellowship for postdoctoral research, and is an Azrieli Foundation Early Career Faculty Fellow.

https://www.finkelstein.sites.tau.ac.il/

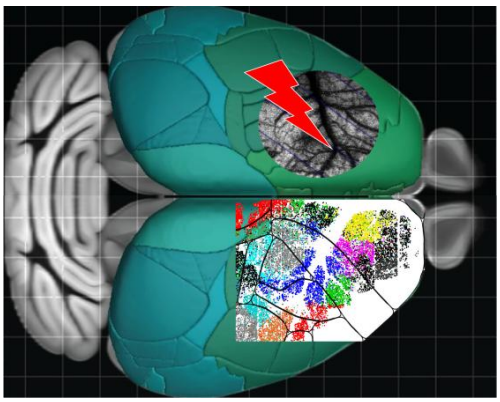
Nervous System and Brain Disorders

Dr. Arseny Finkelstein

Memory formation and neural plasticity

The brain is a highly plastic system that is constantly changing. Changes in interactions between neurons allow us to learn from experience and to create new memories. The long-term goal of Dr. Finkelstein's lab is to study what constitutes the building blocks of memory by literally watching how memories are formed using optical imaging of the living brain, and by implanting artificial memories directly into the brain using novel optogenetic methods.

Dr. Finkelstein studies memory formation processes using mice engaged in cognitively complex behaviors involving decision-making and navigation. The lab employs cutting edge microscopy techniques allowing turning on or off specific neurons in the brain, in combination with advanced computational methods for modeling and analysis of neural dynamics. In addition to studying changes in neural interactions in the healthy brain, Dr. Finkelstein's lab will study another important aspect of neural plasticity – the reorganization of brain networks during neurodegeneration, with a focus on brain plasticity following stroke.



Nervous System and Brain Disorders

Prof. Illana Gozes

Prof. Gozes, PhD, is Professor Emeritus and head of the Dr. Diana and Zelman Elton (Elbaum) Laboratory for Molecular Neuroendocrinology at the Department of Human Molecular Genetics and Biochemistry, Gray School of Medical Sciences, the Adams Super Center for Brain Studies and the Sagol School of Neuroscience. She is Vice President of Drug Development at Exonavis Therapeutics. Her BSc is from Tel Aviv University, Direct PhD from the Weizmann Institute of Science, and her postdoc was performed at the MIT and Salk Institute. Prof. Gozes was a Senior Scientist/Associate Professor at the Weizmann Institute and Fogarty-Scholar-in-Residence at the NIH, USA. Prof. Gozes has been awarded the Tel Aviv University's Vice President Award, Olson Prize, Julodan Prize, Teva Prize, Neufeld Award, Hanse-Wissenschaftskolleg (HWK) Fellowship, Humboldt Award, the Landau Prize for Life Achievements and the RARE Champion of Hope Award. She is the President of the European Society for Neurochemistry (ESN), was a member of the Israeli Ministry of Education, Council of Higher Education and is the Editor-in-Chief of the *Journal of Molecular Neuroscience*.

Therapeutics for autism and brain protection

Prof. Gozes discovered and studies Activity-dependent neuroprotective protein (ADNP), recognized as a leading gene accounting for 0.17% of autism spectrum disorder (ASD) cases globally. The Gozes laboratory focuses on genome editing, to test and develop therapeutics such as the ADNP enhancing fragment NAP (davunetide) and pipeline products, for effects on autism and other ASD-related predicaments. Prof.

Gozes further discovered convergence among autism, schizophrenia, stress-related ailments and Alzheimer's disease with ADNP playing a role in all of these diseases. In a recent paper, assessing clinical trial results separating men and women, the Gozes team discovered efficacy for davunetide in women suffering from progressive brain degeneration (progressive supranuclear Palsy). As such, the Gozes laboratory strives to pave the way to novel diagnostics and treatments toward healthy development, maturation and aging of the brain.

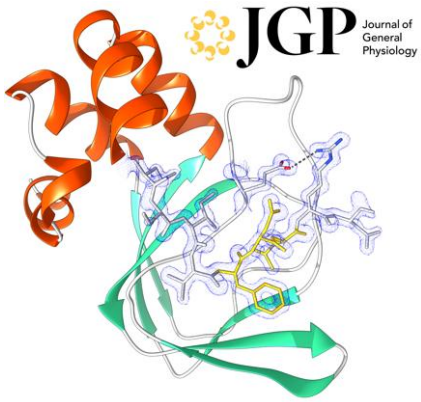
Prof. Yoni Haitin, PhD, is a member of the Department of Physiology and Pharmacology in the Gray School of Medical Sciences and Sagol School of Neuroscience. After completing his PhD studies at Tel Aviv University, he continued his postdoctoral training at the University of Washington, where he was awarded the Human Frontier Organization Long Term Postdoctoral Fellowship. Upon his return, Prof. Haitin established a structural-physiology research program. Prof. Haitin served as the secretary of the Israeli Society for Physiology and Pharmacology and is on the editorial board of PLoS One. He headed the Joint Undergraduate Program for Life Sciences and Medicine and is currently the head of the M.Sc. program at the School of Graduate Studies of the Gray Faculty of Medical and Health Sciences.

https://www.haitinlab.sites.tau.ac.il/

Nervous System and Brain Disorders

Prof. Yoni Haitin

Ion channels in disease



Proteins are molecular machines essential for all cellular activities. When they malfunction due to genetic mutations or environmental effects, they also underlie and facilitate many human diseases. As the roles of these crucial cellular building blocks are tightly related to their atomic structures, deciphering disease-related mechanisms requires scrutinizing proteins' utmost fundamental molecular properties. Prof. Haitin focuses on studying ion channels and prenyltransferases, two types of radically different enzyme families. By utilizing cutting-edge biochemical and biophysical approaches, they delineate the structural mechanisms underlying functional regulation of these key protein families. Moreover, given the emerging pivotal roles these proteins play in numerous diseases, they use high-throughput screens to identify novel modulators, which may prove beneficial for future development of targeted therapeutic strategies.

Prof. Hendler, MD-PhD, is a member of the Department of Physiology and Pharmacology of the Gray School of Medical Sciences, the School of Psychological Sciences and the Sagol School of Neuroscience at Tel Aviv University. She earned her PhD in SUNY at Stony Brook, NY, USA and her MD at Tel Aviv University. Hendler completed a psychiatry residency at the Sheba Medical Center. She is the founding director of the Sagol Brain Institute at the Tel-Aviv Medical Center. She was awarded the leading scientist voucher by the Flagship EU Program of the Human Brain Project. She is the inventor and chief medical scientist at GrayMatters Health.

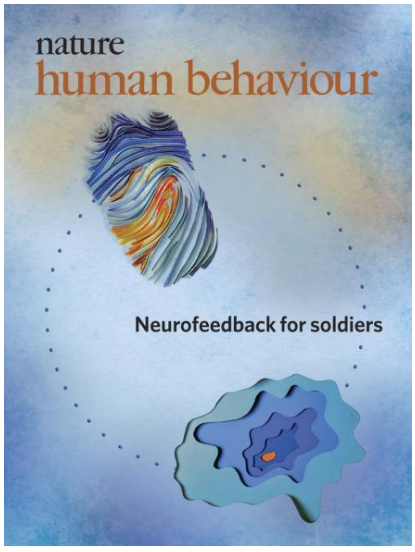
https://www.cbf-tlv.com/

Nervous System and Brain Disorders

Prof. Talma Hendler

Neuropsychiatry and neuromodulation

The main research aim in the Hendler lab is to harness the brain for improving mental health, by examining emotional brain processing in healthy and diseased human states. They are approaching the problem by applying multi-scale brain imaging (fMRI, EEG and intracranial recording), ecological behavioral sessments and computational modeling. Prof. Hendler is using innovative neuroimaging methods, and prospective large scale human studies to untangle cause from consequence in mental disorders with respect to traumatic stress, Her team was the first in Israel to apply simultaneous recording of EEG/fMRI in humans, and the first in the world to perform a prospective study in humans showing that the amygdala is a vulnerability marker for traumatic stress psychopathology, developing and validating an fMRI-informed electrical fingerprint of the amygdala and applying it in self-neuromodulation (NueroFeedback) for stress resilience.



Keynan…Hendler 2019

Prof. Henkin, PhD, from the Department of Communication Disorders at the School of Health Professions, completed her PhD and post-doctoral studies at TAU and at the University of Michigan, respectively, focusing on auditory processing in cochlear implant recipients, using auditory cortical neurophysiology. Prof. Henkin is Head of the Hearing, Speech, and Language Center and Communication Disorders Services, and co-director of the cochlear implant program at the Sheba Medical Center. She manages a diverse spectrum of diagnostic and therapeutic activities in the field of communication disorders including audiology, hearing rehabilitation, speech, language, communication disabilities, and swallowing disorders. She was awarded the DFG German-Israeli grant in collaboration with scientists from the University of Hannover. Prof. Henkin consults the Israeli Ministry of Health on various topics in the fields of communication disorders and hearing healthcare.

Nervous System and Brain Disorders

Prof. Yael Henkin

Auditory neuroscience and hearing rehabilitation

What are the neurophysiological underpinnings of auditory processing in the normal and impaired auditory system? how are they affected by increasing age, monaural vs. binaural listening, and by rehabilitation with cochlear implants and hearing aids? Prof. Henkin utilizes a complementary auditory neuroscience approach in search of neurophysiological biomarkers and behavioral indices of auditory processing in normal hearing listeners, hearing-impaired listeners with bilateral/unilateral hearing loss habilitated by cochlear implants and hearing aids, and in children with autism, selective mutism, and auditory processing disorders (APD). Her clinical experience in audiology and hearing rehabilitation have set the ground for clinical research aimed at transforming research findings into diagnostic and rehabilitative approaches.

Prof. Itzhaki, PhD, is head of the Department of Nursing, School of Health Professions. She is the first registered nurse in Israel to have completed a direct PhD track, which she obtained at the Department of Nursing at Tel Aviv University. She completed her post-doctoral training at the Department of Sociology & Anthropology at Bar-Ilan University. She collaborates with nursing theorists in academic institutions worldwide, exploring caring and emotional resilience in multicultural societies.

https://caring.science/leadership.html

Nervous System and Brain Disorders

Prof. Michal Itzhaki

Emotion management

Feeling rules are unwritten social rules that dictate the strength of emotions appropriate for different situations. In case of incompatibility between experienced and socially expected emotions, emotional management is required to overcome the dissonance. Prof. Itzhaki explores the emotional management of patients and caregivers in complex, challenging, and demanding health and illness situations: emergencies and disasters, violence in the health care system, life-threatening situations, multicultural dilemmas, mental, terminal, and chronic illnesses.

The investigation of the emotional management experienced by nurses and physicians includes attention to caring and personal/staff resilience. Her research forms the basis for developing intervention programs aimed at efficient emotional labor, which includes raising the caregiver/patient's sense of resilience and emotional support.

Prof. Kishon-Rabin, PhD, is at the Department of Communication Disorders, School of Health Professions and is the Dean of Innovation in Teaching & Learning at Tel Aviv University. She completed her PhD in psychoacoustics from the Speech & Hearing Sciences Department at the Graduate Center, City University of New York. She was the first Israeli to be awarded with the Graham Fraser Memorial Lecture by the British Cochlear Implant Group. She is an associate editor for the International Journal of Audiology. She is vice president of the European Federations of Auditory Societies (EFAS) and will serve as president from 2021-2023. Prof. Kishon-Rabin initiated a series of social startups in infant day-cares and pre-schoo,l bringing evidence-based practice of language acquisition programs to practitioners, caretakers and parents either directly or via novel on-line programs.

Nervous System and Brain Disorders

Prof. Liat Kishon-Rabin

Speech processing and brain plasticity in cochlear implant users

Prof. Kishon-Rabin investigates the effect of sensory, cognitive and linguistics processes that are involved in speech perception in optimal and degraded listening conditions in normal and pathological hearing. The different factors that influence performance assist in understanding the wide variability in performance of implanted cochlear implant users, as well as in developing habilitation protocols that are tailored to the hearing-impaired individual. Prof. Kishon-Rabin was one of the first to study functional hearing in infants with cochlear implants, for which she received worldwide recognition. She investigates the influence of auditory stimulation and experience dependent factors that drive cortical development in infants using video analysis and brain-imaging techniques. Her team are pioneers in implicit learning processes via auditory modality using fNIRS measurements, for the first time for cochlear implants in Israel.

Dr. Laviv, PhD, is at the Department of Physiology and Pharmacology of the Gray School of Medical Sciences and the Sagol School of Neuroscience. His PhD in neurobiology was conducted in the Interdisciplinary Doctoral Program in Neurosciences at Tel Aviv University. His postdoctoral research was conducted at the Max Planck Florida Institute for Neuroscience (Jupiter, Florida). He received a BSc in the Joint Program in Life and Medical Sciences at Tel Aviv University. Dr. Laviv received two international postdoctoral fellowships, from the European Molecular Biology Organization (EMBO) and the Human Frontiers Science Program (HFSP). He was awarded the ERC Starting Grant and the Ben Barres early career investigator award from the Chan Zuckerberg Initiative (CZI).

https://www.lavivlab.com/

Nervous System and Brain Disorders

Dr. Tal Laviv

Protein signaling dynamics in the brain

The brain has an amazing capacity to change throughout our life, a process essential for our most basic functions: experiencing the world through our senses, learning a new task or remembering past events. This involves highly synchronized changes in electrical activity of cells within the brain, much like individual orchestra tools playing together to achieve harmony. Inside cells, complex array of proteins provide the molecular instructions for this process. We develop biosensors, sensitive biological devices and specialized microscopy to visualize them in the brain. Our main goal is to explore the protein landscape in the living brain, during processing of information from the environment. This approach, first of its kind in Israel, will allow us to better understand the inner workings of the healthy brain, and identify critical failure points leading to detrimental conditions such as cognitive decline and neurodegeneration.

Prof. Nir, PhD, is at the Department of Physiology and Pharmacology of the School of Medicine and is a member of the Sagol School of Neuroscience and the Department of Biomedical Engineering at the Faculty of Engineering. He completed his PhD at the Weizmann Institute of Science and his postdoctoral training at the Center for Sleep and Consciousness, University of Wisconsin-Madison. He serves as the scientific director of the Sieratzki-Sagol Centre for Sleep Medicine at the Tel-Aviv Sourasky Medical Center. He has been awarded the Sieratzki Prize for Advances in Neuroscience and the Adelis Neuroscience Prize.

https://yuvalnirlab.com/

Nervous System and Brain Disorders

Prof. Yuval Nir

Sleep

Sleep is a universal behavior that is present across the animal kingdom. We spend a third of our lives sleeping but still do not fully understand what it is for. Prof. Nir is studying the relationship between sleep and cognition using a unique combination of animal and human research: what it is about sleep that keeps us 'disconnected' from the external environment? How does sleep promote learning and memory? Can we harness sleep to improve neuropsychiatric diagnosis and counteract neurodegeneration?

Prof. Offen, PhD, is a member of the Department of Human Molecular Genetics & Biochemistry in the Gray School of Medical Sciences and Sagol School of Neuroscience. He studied molecular biology, specializing in RNA processing, at the Weizmann Institute of Science, Israel. He furthered his education at the Albert Einstein College of Medicine, NY, USA, as a Post Doctoral Fellow, where he developed transgenic models of autoimmunity. Offen heads the Laboratory for Neurosciences at the Felsenstein Medical Research Center, Tel Aviv University. Prof. Offen is a co-founder of several biotechnology companies developing gene and cell therapies for neurological disorders. One of them, Brainstorm Cell Therapeutics, showed efficacy in ALS patients in a Phase III clinical trial.

https://www.danioffenlab.com/

Nervous System and Brain Disorders

Prof. Dani Offen

Translational neuroscience

Prof. Offen's work has concentrated on the processes of cell death in neurodegenerative diseases, specifically in Parkinson's and ALS. He focuses on developing cell-based and gene-based therapies for neurodegenerative diseases. His team uses advanced methods, such as CRISPR/Cas9, for in vivo gene modification, and takes advantage of multiple platforms for the delivery of therapeutics into the CNS, including mesenchymal stem cells, exosomes and peptides.

Using cell cultures and animal models, his team evaluates the effect of gene modification on cognition and behaviour, as well as on disease-related biochemical and histological features. Recently, Prof. Offen and his group conducted pioneering work in the role of stem cells in health and disease

Prof. Moshe (Shiko) Parnas, PhD, a member of the Department of Physiology and Pharmacology of the Gray School of Medical Sciences and Sagol School of Neuroscience, completed his PhD studies at the Hebrew University of Jerusalem. He conducted his postdoctoral training at the University of Oxford, where he was awarded the European Molecular Biology Organization and the Edmond & Lily Safra Center for Brain Sciences Long Term Postdoctoral Fellowships. He previously had an ERC starting grant and now holds an ERC consolidator grant.

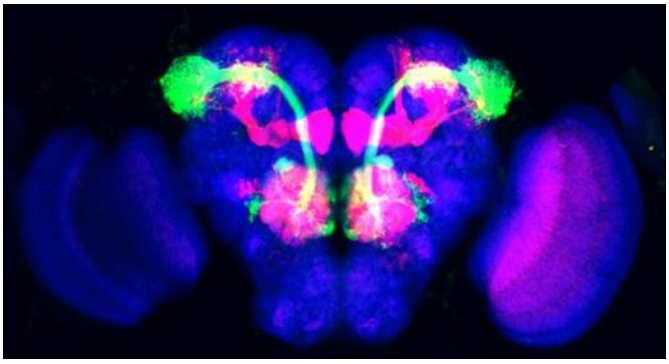
https://www.parnaslab.sites.tau.ac.il/

Nervous System and Brain Disorders

Prof. Moshe Parnas

Neural circuits encode learning and memory

The Parnas lab uses the fruit fly to study how neural circuits encodes information and support behavior, learning and memory. Using a multidisciplinary approach, we modulate the activity of single proteins and neural circuits in behaving animals and examine the consequences such manipulations have on flies' perception, decisions and behavior. In particular we are interested in a novel phenomena in which G-protein coupled receptors (GPCRs) change their activity when neurons change their electrical activity. Whether these changes in GPCR activity have physiological importance is unknown. Approximately 35% of approved drugs target GPCRs. Thus, unraveling the physiological roles of this novel phenomena may lay the foundation to an entire new approach of drugs development.



Prof. Perlson, PhD, is head of the Department of Physiology and Pharmacology of the Gray School of Medical Sciences. He completed a PhD at the Weizmann Institute of Science in molecular and cellular neurobiology. As a Postdoctoral Research Fellow at University of Pennsylvania Medical School, he focused on understanding the mechanisms underlying axon degeneration in ALS.

http://www3.tau.ac.il/medicine/perlson/

Nervous System and Brain Disorders

Prof. Eran Perlson

Amyotrophic Lateral Sclerosis (ALS)

ALS is a devastating adult-onset disease marked by the death and degeneration of motor neurons, with no current effective treatment. However, hope is on the horizon with the groundbreaking work of Prof. Perlson and his team. By using NMJ-on-a-Chip, a silicon platform which uniquely mimic the human motor unit, advanced molecular/cellular neurobiology approaches, state of the art microscopy, genetically engineered mice, and strong collaboration with neurologists, they are leading the charge in ALS research.

The Perlson lab is dedicated in understanding the critical molecular mechanisms underlying ALS. They focus on local protein synthesis and axonal transport, essential for maintaining neuromuscular junctions, the first compartment to fail in ALS. Using cutting-edge Lab-on-a-Chip technology, which grows patients' neurons and muscles on a single chip, they open new possibilities for studying motor neuron degeneration and regeneration. This platform also enables personalized medicine by tailoring treatments to individual patients. By stopping nerve degeneration and promoting regeneration, Perlson lab aim to develop effective treatments for ALS and other neurodegenerative diseases.

Prof. Portnoy, PhD, is head of the Department of Occupational Therapy at the School of Health Professions. Prof. Portnoy received her B.Sc. in Electronic Engineering at Tel Aviv University and her M.Sc. and Ph.D. in Biomedical Engineering at the Musculoskeletal Biomechanics Laboratory at Tel Aviv University. Previously, she was the scientific director of the Gait and Motion Laboratory at the Hadassah Medical Center in Jerusalem.

https://www.tau.ac.il/~portnoys/

Nervous System and Brain Disorders

Prof. Sigal Portnoy

Technology for rehabilitation

The promise of new and exciting technologies to enhance the world of motor and cognitive rehabilitation, relies on its integration in the clinics. One of the main goals of Prof. Portnoy is to create and distribute accessible and innovative tools that will promote the use of technologies in rehabilitation. Among the developed tools are a software that evaluates cognitive function, validated, published and to date, downloaded by more than 250 users worldwide, and a software that automatically fits the dimensions of virtual model of orthoses for 3D printing, according to simple limb measurements performed by the clinician, and a haptic-based virtual reality evaluation of discrimination of stiffness and texture.

Dr. Rozani, PhD, is at the Department of Nursing in the School of Health Professions. She is a Registered Nurse and holds a Master's Degree in Nursing from Tel Aviv University. Her graduate research study was one of the first in Israel to examine exposure to viral occupational hazards among nurses in the course of their work. She earned a PhD in Epidemiology and Preventive Medicine at Tel Aviv University, examining risk and protective factors associated with Parkinson's disease. These findings were reported to the Israeli Center for Disease Control (ICDC), allowing the ICDC, for the first time, to make a comprehensive report regarding neurodegenerative morbidity in Israel. She then continued her postdoctoral training at the Faculty of Health Science at Ben-Gurion University of the Negev, exploring the indicators of healthy aging.

Nervous System and Brain Disorders

Dr. Violetta Rozani

Bio-physiological factors in aging

Dr. Rozani's research focuses on bio-physiological and psychosocial factors, as well as on case/disease management associated with both aging and chronic illness. She conducts big-data studies based on national and international medical datasets, as well as studies in the clinical field focusing on the well-being of older patients, their families, and medical staff. In her research on bio-physiological factors, Rozani focuses on the association between medications for type two diabetes mellitus treatment and Parkinson's disease, trying to better understand the mechanism of these medications for the prevention or modification of Parkinson's disease. As a researcher in the field of case/disease management, Dr. Rozani examines the quality and safety of care provided by nurses in various wards during the hospitalization, as well as the burden of chronic illness experienced by patients, their families, and health care providers.

Dr. Ruban, PhD, at the Department of Nursing in the School of Health Professions, received a PhD in Clinical Pharmacology from the Ben Gurion University. She was a postdoctoral scholar at the Department of Neurobiology at Weizmann Institute of Science. During this period, she and Prof. Teichberg developed a novel Blood Glutamate Scavenging (BGS) technology for the treatment of malignant and neurodegenerative disorders. Her lab research has focuses on evaluating the therapeutic potential of the treatment in the neurotrauma, neurodegenerative and malignant diseases.

https://www.angelarubanlab.com/

Nervous System and Brain Disorders

Dr. Angela Ruban

Spinal cord injury

Spinal cord injury causes permanent changes in strength, sensation and motor functions. Hope of recuperation is slim to none. Primary mechanical damage to spinal cord tissue kills a certain number of neuronal cells. But there is a secondary damage due to the release of excess glutamate, which is responsible for an additional functional disability. Our main idea is to reduce the secondary damage as soon as possible — to block the body's reaction to the spinal cord trauma. Our new study finds the intravenous injection of a

potent enzyme, just hours after the accident, has the potential to diminish a cascade of pathological events responsible for neuronal death, such as inflammation and scarring. It will be the first emergency treatment for neurotrauma in the world. We suggest administering the injection by paramedics even in cases of uncertain diagnosis. There is no side effect, but it might just mitigate secondary damage and dramatically improve the quality of a person's life.

Prof. Rubinstein, PhD, is head of the Goldschleger Eye Research Institute, a member of the Department of Human Molecular Genetics of the Gray School of Medical Sciences and Biochemistry and the Sagol School of Neuroscience.
She completed her Ph.D. studies at Tel Aviv University and her postdoctoral training at the University of Washington, Seattle, USA. Prof. Rubinstein's research focuses on deciphering the neuronal basis of neurodevelopmental disorders and developing novel treatment options for these devastating conditions.

https://moranrub.wixsite.com/rubinsteinlab

Nervous System and Brain Disorders

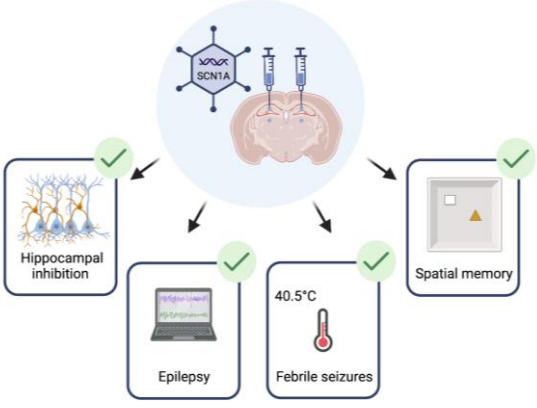
Prof. Moran Rubinstein

Molecular basis of developmental epilepsies and autism

Neurodevelopmental disorders, which include cognitive impairment, severe epilepsy and autistic features, are the leading cause of morbidity in children. While genetic studies, exposing involvement of specific genes in the etiology of these disorders, have contributed to diagnosing these disorders, our understanding of the pathophysiological pathways leading from a genetic mutation to abnormal brain function is limited.

To bridge this gap, Prof. Rubinstein's lab uses mouse models, which mimic the human disorders. By combining genetic, electrophysiological, and behavioral approaches, their goal is to elucidate the neurobiological basis of these disorders and unveil novel diagnostic and therapeutic approaches.

The lab have recently developed a novel viral mediated gene therapy treatment for Dravet syndrome, a devastating form of developmental epilepsy caused by mutations in the SCN1A gene .



Dr. Saban, PhD, is in the Department of Occupational Therapy at the School of Health Professions. Dr. Saban completed his Clinical Neuropsychology Ph.D. studies at the Department of Psychology of the University of Haifa. He then completed his postdoctoral training at the University of California Berkeley in the Department of Psychology, and the Helen Wills Neuroscience Institute, where he received the Rothschild Fellowship.

Nervous System and Brain Disorders

Dr. William (Will) Saban

Test your brain remotely

Remote testing enables researchers to collect vast amounts of data. Dr. Will established the Center for Accessible Neuropsychology (CAN), specializing in remote neuropsychological testing for people with neurological conditions such as Parkinson's Disease, Alzheimer's, Ataxia, and Dyslexia. For instance, through the CAN approach, data can be collected from nearly 2,000 participants, whereas in-person studies might have 20 participants.

Using machine-learning algorithms, CAN aims to identify risk factors and cognitive markers, promote earlier disease detection, and develop cognitive treatments. Together with several researchers, neuroscientists, and physicians located in Israel, the United States, and around the world, Will is building iPONT: an international platform for online neuropsychological testing.

Prof. Slutsky, PhD, is the head of the Department of Physiology and Pharmacology at the Gray School of Medical Sciences , the head of the Sieratzki Institute for Advances in Neuroscience, and a member of the Sagol School of Neuroscience at Tel Aviv University. Prof. Slutsky completed her PhD at the Hebrew University of Jerusalem and post-doctoral studies at MIT. She is a member of the American Federation for Aging Research (AFAR) National Scientific Advisory Council, editorial member of eLife and Scientific Reports journals. Dr. Slutsky is a recipient of the MetLife Foundation Prize in Alzheimer's research, Bernard Katz Prize in Neuroscience, the New Investigator Award in Alzheimer's Disease from American Federation for Ageing Research, the Sieratzki Prize and the ERC Starting, Consolidator and Advanced Awards. Prof. Slutsky is the President of the Israel Society for Neuroscience.

https://www.slutskylab.com/

Nervous System and Brain Disorders

Prof. Inna Slutsky

Resilience of neural circuits to Alzheimer's disease

Prof. Slutsky's research focuses on understanding the basic mechanisms that maintain the stability of neural circuits, synaptic plasticity, and memory function. Moreover, her laboratory studies how the dysregulation of these processes initiates memory dysfunctions in Alzheimer's disease (AD). Using optical imaging, electrophysiology, and molecular biology, Slutsky's team aims to identify circuit-level mechanisms that drive the transition from the presymptomatic to symptomatic stages in AD. Dr. Slutsky and her team have discovered how patterns of neuronal activity and sensory experience regulate the molecular composition of amyloid-beta, the physiological role of amyloid-beta, the role of magnesium ions in cognitive enhancement, and the role of the limbic thalamus in the hyperexcitability of hippocampal circuits during the presymptomatic stages of AD. Their work demonstrates that deep brain stimulation of the thalamic nucleus reuniens can boost resilience to synaptic, neuronal and cognitive deficits in a mouse model of AD by rescuing circuit-level homeostasis.

Dr. Tavor, PhD, from the Department of Anatomy and Anthropology at the Gray School of Medical Sciences and the Sagol School of Neuroscience, completed his PhD at Tel Aviv University. He then proceeded to a postdoctoral training at the University of Oxford where he specialized on advanced imaging techniques. He holds an inter-disciplinary lab, combining computational, statistical and cognitive neuroscience methods to study the human brain and behavior.

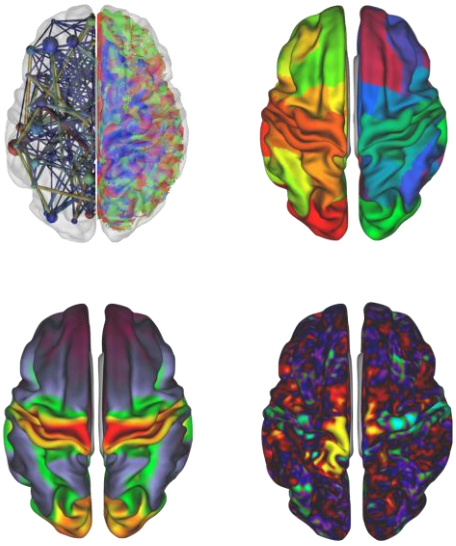
https://www.tau.ac.il/~idotavor/

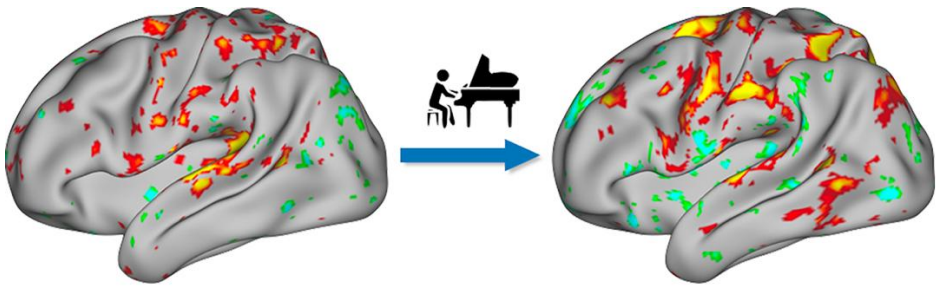
Nervous System and Brain Disorders

Dr. Ido Tavor

Brain structure, function and human behavior

What makes us different? While doing the exact same thing, different individuals present different patterns of brain activity. Dr. Tavor studies what underlies behavioral and functional differences between individuals using Magnetic Resonance Imaging (MRI). Specifically, he uses advanced imaging techniques to examine how modifications in brain connectivity and microstructure affects brain function and human behavior, both in healthy and clinical populations. By better understanding the relations between brain function and structure, new insights on human behavior may be gained.





Dr. Wolpe, MD, PhD, Department of Physical Therapy in the School of Health Professions, completed his medical degree at the Hebrew University, Jerusalem. He completed an MSc degree in Neuroscience and PhD at University College London and was a Bill & Melinda Gates Scholar and post-doctoral fellow at the University of Cambridge. He received a National Institute of Health Research Academic Clinical Fellowship in general psychiatry, allowing him to combine clinical psychiatry and academic work.

https://psyact.org/

Nervous System and Brain Disorders

Dr. Noham Wolpe

Psychiatry in action

It may seem quite menial, but even a simple action like reaching for a cup of coffee requires complex, yet instantaneous computations by the brain. In addition to variables like how full the cup is or the shape of the cup, there are many other factors that can affect these computations. Changes in cognition, such as memories of using similar cups in the past, and changes in mental health, affecting how much we value drinking this coffee – can all determine how we will reach for and grasp this cup of coffee. Dr. Wolpe's research aims to improve our understanding of the links between cognition, mental health and action both in health and disease. More specifically, a main theme of the current research is how mental health impacts cognition and motor functioning across the adult lifespan. His team examines the role of specific mental health factors, such as motivation, in bringing about age-related decline. For our research, we combine clinical and basic neuroscience methods, including neuroimaging and computational models of behaviour.

Dr. Nativ-Zeltzer, PhD, is at the Department of Communication Disorders of the School of Health Professions. Dr. Nativ-Zeltzer completed her Ph.D. studies at Northwestern University and her postdoctoral training at the University of California Davis Department of Otolaryngology-Head and Neck Surgery, where she was the recipient of the Dickenson Fellowship.

Nervous System and Brain Disorders

Dr. Nogah Nativ-Zeltzer

Swallowing disorders

Swallowing disorders are prevalent in older adults and have severe health implications including dehydration, malnutrition, pneumonia and reduced quality of life. Dr. Nativ-Zeltzer's research focuses on investigating the effects of ageing on the swallow and devising prophylactic treatment methods for the preservation of swallow function in the elderly. She utilizes high resolution manometry and biomechanical analysis of the swallow to characterize physiological components of both normal and disordered swallowing, with the goal of designing accurately targeted preventative and rehabilitative treatment for adults with dysphagia (difficulty swallowing). Her research also focuses on identifying risk factors and biomarkers for the development of aspiration pneumonia, a common complication of swallowing disorders, and translating these research discoveries into novel approaches for pneumonia prevention in individuals with dysphagia.

Prof. Ruth Defrin, PhD, is at the Department of Physical Therapy in the School of Health Professions. She completed a Bachelor's degree in Physical Therapy, MSc and PhD in Physiology and Pharmacology at Tel Aviv University and post-doctoral training in pain imaging at the University of Toronto, Canada. Prof. Defrin established the Pain Laboratory, which includes branches in several departments of affiliated hospitals. Prof. Defrin founded the Biomed@TAU Pain Research Hub and was the research chair of the Israeli Pain Association for several years. Prof. Defrin has won the Dean's Award for Excellence in Teaching and the Israeli Pain Association Award for outstanding contributions in the promotion of national and international pain research.

Nervous System and Brain Disorders

Prof. Ruth Defrin

Pain and PTSD

A traumatic spinal cord injury may provoke a debilitating, lifelong pain in some people, whereas other people may remain pain free thereafter. Similarly, some people develop posttraumatic stress disorder (PTSD) in the aftermath of traumatic events, which is often accompanied by chronic pain, whereas other people are resilient to both PTSD and chronic pain. By applying a multidisciplinary approach using advanced psychophysical, physiological and imaging methods, Prof. Defrin aims to uncover the mechanisms leading to these seemingly opposite effects of physical and psychological stressors. She also searches for biomarkers that enable the prediction of/vulnerability to PTSD and to chronic pain. Early detection of vulnerability would enable preemptive management, which may mitigate or prevent the hazardous consequences of such pathological conditions.

Public Health

Public health laboratories at the Faculty of Medical & Health Sciences are responsible for providing timely and reliable results, primarily for the purpose of disease control and prevention, as well as improving quality of life across range of population.

Our public health researchers conduct interdisciplinary studies, incorporating behavioral health, mental health, health education, occupational safety, disability, gender issues in health, reproductive epidemiology, and disease prevention.

Programs

Summer Institute of Advanced Epidemiology and Preventive Medicine, in collaboration with Johns Hopkins University Bloomberg School of Public Health

Emergency & Disaster Management Program

Prof. Adini, PhD, at the Department of Emergency& Disaster Management in the School of Public Health, is an expert in both field and academic activities in disaster management. Adini serves as a board member of Local Authorities Confronting Disasters and Emergencies (LACDE) and the Israeli National Council for Trauma and Emergency Medicine and served two terms as a board member of the World Association of Emergency & Disaster Medicine (WADEM).

Public Health & Disaster Management

Prof. Bruria Adini

Resilience during crises

Resilience is crucial in crisis management, encompassing the ability of populations, responders, and societal infrastructure to withstand and recover from adversity. Key questions include: What factors influence compliance with behavioral directives? How do different dimensions of resilience affect well-being and adaptive capacity? What predicts resilience at individual, community, and societal levels? How does resilience relate to distress and impact adherence to authorities' directives?

Individual, community, national, societal, and organizational levels of resilience are a vital component of the capacity to cope with all crises. The evolving research findings facilitate policy-makers' ability to sustain or modify measures to improve the management of varied adversities, including the COVID-19 pandemic, the Ukraine crisis, the judicial reform, the prologed "Iron Swords" war, the climate change, and other emerging threats.

Prof. Bodas, MPH, PhD, is head of the Department of Emergency & Disaster Management in the School of Public Health. Formerly, he served as the acting director of the Israel National Center for Trauma & Emergency Medicine Research, Gertner Institute of Epidemiology. Prof. Bodas holds a B.Sc. in Life Sciences, a Master's in Public Health (MPH) with an emphasis in emergency and disaster management, and a PhD in Disaster Management, all from Tel Aviv University. He completed a post-doctoral fellowship at the Research Center in Emergency and Disaster Medicine (CRIMEDIM) in Novara, Italy, where he studied the Italian population's preparedness for earthquakes. For over seven years, Prof. Bodas held the position of Chief Technical Officer (CTO) of PrevenTech Ltd, a CBRN Defense company based in Israel. Prior to that, he served as a CBRN Defense Officer at the Israeli Ministry of Defense.

Public Health

Prof. Moran Bodas

Health behavior researcher, disaster psychology

Prof. Bodas deciphers the psychosocial determinants of preparedness behavior and develop newer and more refined behavioral models that could explain why disaster risk communication falls short of achieving its goal of promoting public readiness to emergencies.

Among his research topics:

- Disaster psychology, public behavior, and motivation
- Risk communication and strategies for optimal risk messaging
- Public health, well-being, and resilience
- Emergency medicine and trauma
- Preparedness and response to CBRN (Chemical, Biological and Radio-Nuclear) threats

Prof. Chodick, PhD, MHA, School of Public Health, earned his MSc and PhD degrees in Epidemiology from Tel Aviv University, where he also completed his Master's in Health Administration. He was a Fulbright Visiting Scholar at the School of Public Health, UNC at Chapel Hill and completed a two-year post-doctoral fellowship at the National Cancer Institute in Bethesda. Prof. Chodick previously headed the Maccabitech Institute for Epidemiology and Database Research at Maccabi Healthcare Services, the second largest HMO in Israel. He heads the TAU-AstraZeneca BEAM Hub.

Public Health

Prof. Gabriel Chodick

Epidemiology and database research

The integrated system of state-mandated health providers in Israel has facilitated the linking of inpatient, outpatient, hospital, ambulatory care, pharmaceutical, and laboratory data. Prof. Chodick uses the wealth of real-world data for policymaking and guidelines to increase well-being and improve prevention efforts. His focus has been to study the use of new drugs, study the long-term adverse outcomes of cancer, metabolic disorders, and vascular events, and assess the economic and medical burden of diseases. During the pandemic, Prof. Chodick has led observational studies that have given immediate findings to decision makers such as the safety of ACE-I therapy, and the effectiveness of COVID vaccines and anti-viral therapies. Chodick's lab's goal is to further develop the use of healthcare electronic records, registries, and other data resources to improve the quality of healthcare delivery and clinical innovation.

Prof. Cohen, PhD, MPH, is Professor Emeritus at the Department of Epidemiology and Preventive Medicine in the School of Public Health. He is former head of the School of Public Health and the Chair of the Middle East Consortium for Infectious Diseases Surveillance (MECIDS). Prof. Cohen has served for many years on the National Advisory Committee on Vaccines and Infectious Diseases and is currently a member of working groups on the COVID-19 immunization program in Israel. Prof. Cohen is an appointed member of the WHO COVID-19 working group for selection of candidate vaccines for the WHO solidarity vaccine trial.

https://en-med.tau.ac.il/profile/dancohen

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Public Health

Prof. Dani Cohen

Epidemiology of infectious diseases and vaccinology

Prof. Cohen's research has contributed to the development of Shigella conjugate vaccines, which are currently the leading Shigella vaccine candidates. Prof. Cohen studies the immune response following natural exposure to Shigella species or vaccination with Shigella candidate vaccines. His group has developed immunological correlates of protection against shigellosis and are currently quantifying them in observational and vaccine studies facilitated by competitive grants, including support from the Bill and Melinda Gates Foundation. A longstanding expertise developed by Prof. Cohen and his group in Israel in different populations at risk for diarrheal diseases and shigellosis are currently applied in studies for young children in low- and middle- income countries severely affected by shigellosis. Prof. Cohen is involved in the preclinical development of a conjugate vaccine against brucellosis and in the performance of sero-epidemiological studies of selected vaccine preventable diseases.

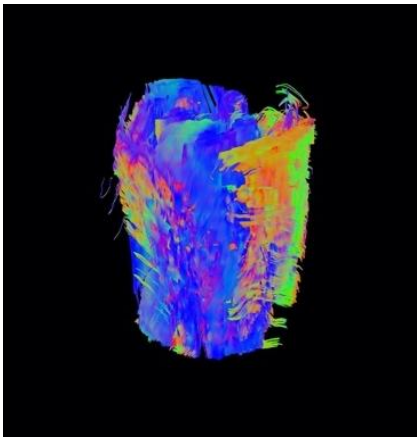
Prof. Gepner, PhD, School of Public Health, completed his PhD at Ben-Gurion University on the role of lifestyle intervention on various body fat depots. He then continued his training in the Department of Sport and Exercise at University of Central Florida, to better understand the field of exercise physiology in both applied and basic in nature. Prof. Gepner is the head of the Department of Epidemiology & Preventive Medicine. He was awarded the 2020 Neufeld Memorial Research Grant, which runs concurrently with his BSF and other grants.

https://www.gepnerlab.com/

Public Health

Prof. Yftach Gepner

Impact of exercise training



Regular physical activity is one of the most important things you can do for your health and has long been touted as a strategy for weight loss. However, only 20% meeting the physical activity guidelines and over 90% of the people who lose weight will gain it all back. Prof. Gepner's research focuses on understanding the impact of exercise training, combined with dietary strategies, on muscle damage and mass, metabolism and performance across a range of populations. Prof. Gepner uses cutting-edge technologies, including magnetic resonance imaging (MRI) for assessing muscle damage and adipose tissue distribution, doubly labeled water to assess energy expenditure and labeled amino acid to determine protein synthesis by muscle biopsy. By combining applied and mechanistic metabolism and physiology adaptation studies, his goal is to elucidate the unique beneficial effect from physical activity.

Prof. Gerber, PhD, School of Public Health, completed his direct track PhD at Tel Aviv University. He then continued his training in the Division of Cardiovascular Diseases, Mayo Clinic College of Medicine, Rochester, Minnesota, in cardiovascular disease epidemiology. He is Director of the Stanley Steyer Institute for Cancer Epidemiology and Research and holds the Lilian & Marcel Pollak Chair in Biological Anthropology. He is an Adjunct Professor of Epidemiology at Mayo Clinic College of Medicine.

Public Health

Prof. Yariv Gerber

Cardiovascular disease epidemiology

Prof. Gerber studies risk factors for and time trends in various vascular diseases across different populations and settings, with the goal of improving public health and training future leaders in epidemiologic research. Much of his work has centered on factors affecting prognosis and well-being of patients suffering an acute myocardial infarction (“heart attack” or MI). His team investigated a large cohort of Israeli patients aged ≤65, longitudinally, hospitalized for a first MI. They assessed the clinical course, risk factor control and adjustments among these patients over decades of follow-up. They have looked at individual and area-based risk factors while applying advanced epidemiologic methods and statistical modeling. The ultimate goal of Prof. Gerber’s work is to reduce the massive burden of vascular disease through advancing the scientific basis for appropriate public health interventions.

Prof. Halperin, PhD, School of Public Health, completed his PhD studies at Edith-Cowan University in collaboration with the Australian Institute of Sport. He studied the effects of augmented feedback on physical performance. He then completed his post-doctoral training at Memorial University of Newfoundland, focusing on ways to optimize exercise training programs. Halperin is the Vice Deputy and a member of the Sylvan Adams Sport Institute.

https://www.halperin-lab.com/

Public Health

Prof. Israel Halperin

Personalized exercise prescription models

Exercise is medicine, yet few get the recommended dose. One reason for this is that exercise prescription models tend to be complicated and generic, leading to low participation and adherence rates. Accordingly, Prof. Halperin studies personalized exercise prescription models that emphasize individual abilities and preferences. Specifically, he investigates the effects of providing trainees with choices regarding the structure of the training sessions (e.g., selecting the number of repetitions) and if trainees can effectively regulate the intensity of exercise based on their subjective experiences (e.g., perception of effort). His team's goal is to develop simple and personalized exercise prescription models that will increase participation and adherence rates, and lead to better health, psychological well-being, and physical performance.

Dr. Samah Hayek, DrPH, is a faculty member in the Department of Epidemiology and Preventive Medicine, at the School of Public Health. She also serves as a senior researcher/ epidemiologist at Clalit Research Institute. Samah holds a BA in statistics, and sociology-anthropology; and a Master Degree in public heath from the University of Haifa. She obtained her doctoral degree in Public Health (Epidemiology) at the University of Kentucky, as a Fulbright scholar. She completed a two-year fellowship at the Center for Disease Control and Prevention (CDC), Atlanta, Georgia, USA. Further, she completed a post-doctoral study in the department of Epidemiology and Cancer Control, at St. Jude Children Research Hospital, Memphis, Tennessee, USA. She heads the Samueli Initiative for Integrative Personalized Health.

Public Health

Dr. Samah Hayek

Leveraging big data to improve public health and cancer care

We are in a new era of medicine and healthcare where innovation and big data are a significant part of healthcare delivery. Cancer care does not only rely on advanced and therapeutic solutions, but it starts years before cancer diagnosis. Further, cancer care does not end with the completion of cancer therapy, it continues decades after therapy. Thus, there is a need for establishing innovative approaches and new clinical decision tools to assist in the early identification of individuals at most risk of developing. cancer, based on the combination of genotype and phenotype data. Dr. Hayek's studies explore the late effect of cancer therapies among children, adolescents, and young adult cancer survivors. She has been utilizing big data from large national and international cohorts and using electronic medical record data to answer the unmet medical need of clinicians and patients

Prof. Lerner, MD-PhD, is head of the School of Public Health and a member of the Department of Epidemiology and Preventive Medicine. She is a board-certified physician in Epidemiology and Public Health with special emphasis on reproductive epidemiology. She is the founder and director of the National Registry for In Vitro Fertilization Treatment Cycles in Israel and the director of the National Registry for Very Low Birth Weight Infants. Recently, Prof. Lerner was appointed as the head of the Stanley Steyer Institute for Cancer Epidemiology and Research and holds the Stanley Steyer Chair in Prevention and Control of Cancer.

Public Health

Prof. Liat Lerner

Reproduction and infertility

Israel has a world-wide unique epidemiology and public health policy regarding reproduction in general and infertility treatments in particular. Prof. Lerner-Geva are taking a scientific, evidence-based approach to evaluate these topics, including investigation of factors that predicts successful reproduction and having healthy babies. She is carefully assessing on a national basis the short and long-term adverse outcomes of infertility treatments. These insights will lead to the development of safer and better procedures that are of great interest in the national, as well as the international arena.

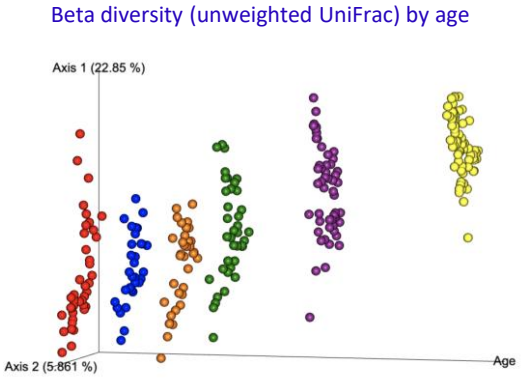
Prof. Muhsen, PhD, is head of the Department of Epidemiology and Preventive Medicine at the School of Public Health. She started her career as a public health nurse in Arab villages in northern Israel. She completed her Master's degree and PhD in Epidemiology and Preventive Medicine. Prof. Muhsen completed a postdoctoral fellowship at the Center for Vaccine Development at the University of Maryland School of Medicine.

Public Health

Prof. Khitam Muhsen

Infectious diseases in the population

Prof. Muhsen's main research field is infectious disease epidemiology, including assessing disease burden, risk factors, and populations' exposure to various pathogens. Helicobacter pylori infection causes chronic gastritis, and in some infected individuals, it causes peptic ulcers and gastric cancer. Her team's current research focuses on the role of *H. pylori* in extragastric diseases e.g., iron deficiency anemia and cognitive function. The epidemiology of enteric infections is also a main research area in her group. They also assess the role of the gut microbiome in children's health and development. During the COVID-19 pandemic, Prof. Muhsen led several epidemiological studies in the Israeli population to assess the transmission of the infection in populations at risk, and the effectiveness of COVID-19 vaccines.



Gut microbiome in infants 2-18 months of age

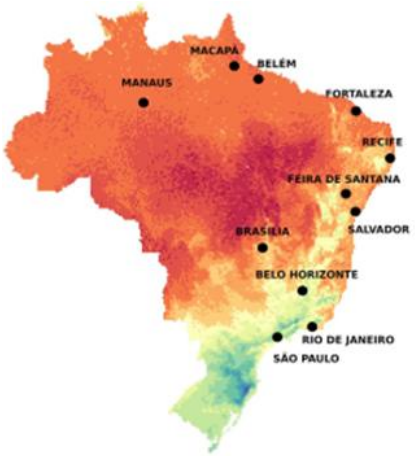
Prof. Obolski, PhD, is in the Department of Epidemiology and Preventive Medicine at the School of Public Health. He obtained a BSc in mathematics, and an MSc and PhD in computational biology from Tel Aviv University. He conducted his postdoctoral research at the University of Oxford as an EMBO Research Fellow.

Public Health

Prof. Uri Obolski

Infections diseases and the environment

Prof. Obolski is interested in infectious diseases and their interactions with the environment. Specifically, his group analyzes the dynamics of mosquito-borne diseases with respect to climate, and patterns of antibiotic resistance and their relation to antibiotic usage. They develop and apply mathematical models, as well as machine learning and advanced statistical techniques to electronic medical records and other disease-related data. For example, they analyzed the relationship between the incidence of dengue virus in Brazil and West Nile Virus in Israel to weather; and they predicted antibiotic resistance patterns of hospitalized patients' infections using machine learning. Prof. Obolski's major aim is to understand and predict the dynamics of infectious diseases to successfully mitigate their future emergence and spread.



Dr. Raanan Raz, PhD, is a faculty member at the School of Public Health. He is an environmental epidemiologist and holds a Bachelor's degree in computer science, an M.Sc. in epidemiology and preventive medicine, and a Ph.D. in neuroscience. Dr. Raz served as a researcher at the Sheba Medical Center, Maccabi Healthcare Services, and the Israel Ministry of Health. After his postdoctoral fellowship at Harvard School of Public Health, he served as a faculty member at the Braun School of Public Health, Hebrew University of Jerusalem, and recently joined Tel Aviv University.

https://raananraz.sites.tau.ac.il/

the School of Public Health

Prof. Raanan Raz

Environmental Health

Dr. Raz's research concentrates on two primary areas: environmental epidemiology and sustainable healthcare. In environmental epidemiology, he studies how environmental factors affect public health. Specifically, he investigates the impact of climate change on women's health and child development outcomes. He also examines the short-term effects of ambient temperatures on primary care outcomes. Additionally, he explores issues related to causal inference in environmental epidemiology and methods for detecting and minimizing bias in this field. In sustainable healthcare, he analyzes the environmental impact of healthcare practices and strategies to reduce them. For example, he assesses the climate footprint of various healthcare activities, the circular economy in healthcare, sustainable anesthesia, and sustainable surgery.

Prof. Rosen, PhD, is at the Department of Health Promotion at the School of Public Health. She completed her B.Sc. at Rutgers University in mathematics, her M.Sc. at the Harvard School of Public Health in biostatistics, and her Ph.D. at the Hebrew University of Jerusalem Braun School of Public Health. Rosen initiated and teaches Israel's only academic course on tobacco control and is on various national and international health advisory committees. Prof. Rosen spearheaded TAU's participation in the global research consortium, the International Tobacco Control Policy Evaluation (ITC) Project, which is the first-ever international cohort study of tobacco use. She is the principal investigator for ITC Israel. Results of the first survey were presented to the Ministry of Health and to the Supreme Court in Case 1416/21 on Neighbor Smoking.

Public Health

Prof. Leah Rosen

Reduction of tobacco-attributable death and disease

Tobacco use is the leading cause of preventable death in the world today, with 8 million annual deaths, and a predicted 1 billion deaths in this century. About a million of the annual deaths are due to exposure to other people's smoking. Prof. Rosen's primary area of research is promoting public health through reduction in tobacco use and exposure. Topics include prevention of child exposure to tobacco smoke, smoking cessation and initiation, public attitudes regarding tobacco policy, and public understanding of tobacco smoke exposure and its dangers. At the intersection of evidence and policy, Rosen contributes to the science base for healthy public policy; her work has been quoted widely in the press, used in policy-making by health bodies and in the Knesset, and submitted to the Supreme Court. Most of Rosen's original research is conducted in Israel, often with ramifications for those in other countries. Rosen's proposal to include tobacco package inserts in all tobacco products, as a means of messaging smokers about risks and ways to quit smoking at very low cost to the government, was passed into law by the Knesset.

Health Professions

Dr. Amit-Aharon, PhD, is at the Department of Nursing, School of Health Professions. She is a registered nurse and holds a Master's degree in health administration from Tel Aviv University and a PhD in public health from Haifa University. Dr. Amit-Aharon serves as the head of the Acceleration Program for non-nursing BA graduates. She was one of the first researchers in Israel to examine parental non-compliance to childhood vaccines during her service as a head nurse in the Department of Public Health at the Tel Aviv-Yafo municipality. Her doctoral dissertation dealt with parental compliance of vaccinations and their feelings of control over health factors.

Public Health

Dr. Anat Amit-Aharon

Culture and decisions affecting health

How does culture influence health? What is the mutual relationship between culture and health? How does cultural diversity generate health differences and disparities and what is the association with health education and promotion? Dr. Amit-Aharon explores these complex issues among a variety of communities, including secular and orthodox Jews, Arabs, and asylum seekers in Tel Aviv. Understanding the associations between culture and health may lead to implementation of programs tailored to individual needs in different communities and hence, reduce health inequity.

Prof. Lahav, PhD, is a faculty member in the Department of Occupational Therapy. She is a licensed clinical psychologist. Prof. Lahav completed her PhD studies at Tel Aviv University, where she studied the longitudinal associations between attachment and perceived health among former-prisoners-of-war of the 1973 Yom Kippur War. She was a post-doctoral fellow at the University of Southern Denmark, where she studied the link between attachment and dissociation during treatment among childhood sexual abuse survivors and at Stanford University, as a Fulbright grantee, where she studied posttraumatic growth, as well as the phenomenon of identification with the aggressor among childhood sexual abuse survivors.

https://www.tau.ac.il/~yaellah1/

Public Health

Prof. Yael Lahav

Trauma and abuse

Prof. Lahav investigates the implications of psychological trauma and focuses on uncovering the mechanisms underlying post-traumatic distress following interpersonal and ongoing traumatic events, such as captivity, domestic violence, as well as sexual, physical, and emotional abuse during childhood. Her interests revolve primarily, around the unique associations. Between the psychological, interpersonal, somatic, physiological, and functional facets of psychological trauma; as well as the interpersonal processes involved in the victim-perpetrator dynamics, known as identification with the aggressor.

Rehabilitation and Educational Training

The Stanley Steyer School of Health Professions

Four clinical fields of study and research

- Communication Disorders
- Nursing
- Occupational Therapy
- Physical Therapy

Our major goal:
To improve the health and wellbeing of our population

Dr. Avrech Bar, PhD, is at the Department of Occupational Therapy at the School of Health Professions. She received her PhD from Tel Aviv University, followed by a postdoctoral fellowship at the University of British Columbia, Vancouver, Canada. She joined the Occupational Science Europe (OSE) - Research Committee as Israel's representative. The committee is responsible for developing the research agenda for Occupational Science Europe.

Rehabilitation and Educational Training

Dr. Michal Avrech Bar

Occupational science

Dr. Avrech Bar’s primary area of research is occupational science, a scientific discipline that is defined as the systematic study of the human as an occupational being. It is the basic science that supports the practice of occupational therapy. As an occupational scientist she studies the relationship between engagement in occupations, health, and wellbeing. The goal of her research is to clarify the nature of these relationships and to provide empirical evidence to support them, especially among women in relation to their role as mothers. In her research she employs advanced qualitative and quantitative methods with healthy women, women in their role as caregivers to their children or spouse and women diagnosed with illness or having a disability.

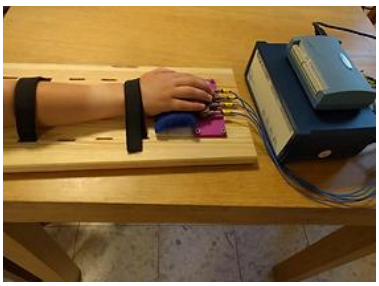
Prof. Friedman, PhD, is in the Department of Physical Therapy, School of Health Professions, where he is a principal investigator and co-director of the Movement Sciences lab. Originally from Australia, Prof. Friedman completed his undergraduate studies at Monash University in Australia, followed by an MSc and PhD at the Weizmann Institute of Science, all in the field of Computer Science. He performed postdoctoral research in the Department of Kinesiology at Penn State University in the US, and in the Department of Cognitive Science at Macquarie University in Australia. Prof. Friedman is co-director of the Synergy Translate initiative on Motor Control: From Neuroscience to Rehabilitation.

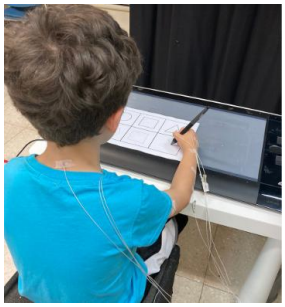
https://www.curiousjason.com/

Rehabilitation and Educational Training

Prof. Jason Friedman

Motor learning





Prof. Friedman takes advantage of his multidisciplinary background to find new ways of looking at problems related to human motor control - how the brain controls movement, and how we learn new movements. In day-to-day life, we perform an enormous variety of movements, usually with little thought. However, we know that planning and executing these movements is in reality very complicated. Prof. Friedman seeks to enhance our understanding of how we produce movements, with a focus on how we can speed up the process of motor learning. He tests applications of the techniques developed in the lab on different populations, including children as they develop, and individuals with motor disorders such as Parkinson's disease and cerebral palsy, with a goal of improving rehabilitation and other motor learning processes. load.

Recently, Prof. Friedman has been studying why we have difficulty in producing slow, smooth movements; how we can optimize learning to play the piano, what is the role of variability in motor learning, and the connection between motor learning and cognitive load.

Prof. Kalron, PhD, PT, is head of the Department of Physical Therapy at the School of Health Professions and affiliated with the Sagol School of Neuroscience. Prof. Kalron completed his undergraduate studies at Ben-Gurion University of the Negev, and his Master's and PhD at Tel Aviv University. He also served as head of the Physical Rehabilitation Research Unit at the Center of Multiple Sclerosis, Sheba Medical Center, Israel. Prof. Kalron is a PI in the Movement and Brain Interaction Research lab.

https://www.alonkalron.sites.tau.ac.il/

Rehabilitation

Prof. Alon Kalron

Physical rehabilitation

Prof. Kalron's research focus is on new (and traditional) physical rehabilitation treatments that affect the brain and improve mobility functions (walking and balance). Additionally, physical activity is a significant interest of the lab, as it has a huge impact on brain function, especially for people suffering from damage in the CNS. The main interest is people suffering from multiple sclerosis (MS), in addition to other population groups, such as ALS and stroke. This line of research will add new insights into the neural mechanisms of physical rehabilitation and open new frontiers for the treatment of people with central neurological damage. Prof. Kalron's work involves creating and testing new rehabilitation treatments that promote brain plasticity and restore lost mobility functions. He challenges conventional thinking by combining new technologies such as Virtual Reality (VR), while tracking the impact via advanced motion sensors in/outside the laboratory environment focusing on real-life situations.

Prof. Masharawi, PhD, is in the Department of Physical Therapy, School of Health Professions and is co-director of the Spinal Research Lab. He specializes in orthopedic and spine disorders. He completed his Bachelor (BPT) at Tel Aviv University, Master's degree at the University of Adelaide, and PhD at the Department of Anatomy and Anthropology, Tel Aviv University. Prof. Masharawi is a reviewer and associate board member of the Spine Journal and an active member of the International Society for the Study of the Lumbar Spine.

Rehabilitation

Prof. Youssef Masharawi

Spinal form and function

Prof. Masharawi founded the Spinal Research Lab, conducting clinical, diagnostic, therapeutic, epidemiological, kinematical, and anthropometric research on the human spine. He has developed unique models for the pathogenesis and biomechanics of various spinal pathologies. Key research projects include studies on the directional and positional preferences in group exercises for individuals with chronic low back pain and osteoporosis, clinical reasoning and decision-making processes, and kinematical evaluations of lumbar rotations in different postures. Additionally, the lab conducts morphometric analyses of normal and pathological human spines.

Prof. Rand, PhD, is at the Department of Occupational Therapy at the School of Health Professions and affiliated with the Sagol School of Neuroscience. She completed her PhD at Haifa University and her postdoctoral training at the University of British Columbia, Canada. She presented her research at international conferences in the field of rehabilitation, gerontology and advanced technologies. Prof. Rand heads the Herczeg Institute on Aging.

https://www.tau.ac.il/~drand/

Rehabilitation and Educational Training

Prof. Debbie Rand

Gaming for rehabilitation

Prof. Rand's research aims to achieve a better understanding of the factors hindering and facilitating the recovery of individuals post stroke and specifically the use of their affected upper extremity.

Her studies are clinical, aiming to research the factors related to the limited recovery of the affected upper extremity. She has developed interventions (utilizing gaming technologies) aimed to improve the affected upper extremity as well as assessment and treatment of the cognitive deficits of these individuals. Recently, Rand has expanded her research to the growing population of (healthy) older adults. She investigates physical and social frailty as well as cognitive decline, aiming to determine ways to promote successful aging.

Osnat Segal, PhD, is head of the Department of Communication Disorders, School of Health Professions. Dr. Segal earned her BA, MA and PhD in Communication Disorders at Tel Aviv University. Her doctoral studies focused on speech perception and language acquisition in infants. During her PhD she established the first dedicated laboratory in Israel for assessing processes in speech perception and language acquisition in infants. Her post-doctoral studies focused on recognition of morphological patterns by infants learning Hebrew and took place at Tel Aviv University and at the Department of Language and Linguistics Science, University of York. She is the Chair of the Israeli Speech Hearing and Language Association (ISHLA), and an executive board member of the International Association of Logopedics and Phoniatrics (IALP).

Rehabilitation and Educational Training

Dr. Osnat Segal

The journey of early language acquisition

One of the most interesting questions in the field of language acquisition is how a newborn becomes a speaker of its native language within the first three years of life. Understanding early language-learning processes, from infancy, is highly important in order to: gain insight on the typical and atypical courses of language acquisition, identify developmental difficulties as early as possible, and assess the influence of interaction, exposure and use of language on the processes of language learning. My goal as a researcher and communication disorders clinician is to study the aforementioned processes of early language development in typically developing infants as a basis for understanding these processes in special populations including children with hearing loss, children with autism spectrum disorder (ASD), children with developmental language disorder (DLD), children with childhood apraxia of speech (CAS), and children from low socio-economic status (LSES).

Dr. Simon-Henri Schless, PhD, is a member of the Department of Physical Therapy, School of Health Professions. He earned his BSc in Physiotherapy at the University of Salford, UK, before completing several years of clinical practice at the ALYN Pediatric and Adolescent Research Center in Jerusalem. Driven to advance his knowledge in movement sciences, Dr. Schless completed a pre-doctoral degree in Human Movement Sciences, followed by a PhD in Biomedical Sciences from KU Leuven (Belgium). Upon returning to ALYN Hospital, he served as the manager of the Motion Analysis Laboratory, with an emphasis on the integration of clinical services. In parallel, he also completed a visiting research fellowship at the University of Jyväskylä, Finland, and currently serves as one of the principal investigators at the ALYN Research Center (PARC).

Rehabilitation

Dr. Simon-Henri Schless

Personalized rehabilitation in motor function

Dr. Schless' laboratory focuses on capturing and analyzing human movement, such as gait—an essential function in daily life. His research aims to bridge the gap between observable movement patterns and the underlying neuromuscular mechanisms that govern them. Using advanced in-vivo ultrasound imaging, he investigates changes in muscle architecture and function during movement. This is complemented by high-density electromyography techniques to study motor unit activation profiles, which provide insights into how the nervous system controls muscle activity. By linking these two areas, the team's research holds significant potential to inform personalized rehabilitation strategies for individuals with impaired motor function, particularly in pediatric populations with movement disorders, such as cerebral palsy.

Dr. Zaltz, PhD, is at the Department of Communication Disorders, School of Health Professions. Her PhD was conducted at the Department of Communications Disorders at Tel Aviv University. Her postdoctoral training on the psychoacoustic cues for voice discrimination in hearing impaired individuals with cochlear implants, as compared to individuals with normal hearing, was conducted at the University of Southern California (USC). Her research work in the areas of auditory skill learning, voice discrimination and speech perception in normal and pathological populations has been presented at leading international and national professional conferences. Dr. Zaltz is an audiologist and a speech therapist.

Rehabilitation and Educational Training

Dr. Yael Zaltz

Auditory training to improve speech perception

Can we improve speech-in-noise perception via behavioral auditory training? What is the best way to do so? Will the improvement last? Dr. Zaltz examines the possibility to enhance the underlying psychoacoustic, linguistic, and cognitive mechanisms for speech perception in degraded listening conditions in normal and pathological populations via auditory training. She explores the behavioral effects of auditory training, including the time course of learning, magnitude of improvements, generalization, susceptibility to interferences, and long-term retention of the learning-gains. She is also the head of a neuroimaging lab that examines the cortical mechanisms that underlie speech perception in individuals with normal hearing and with hearing impairment using functional Near Infrared Spectroscopy (fNIRS).

Technology & AI in Healthcare

Dr. Saban, PhD, is in the Department of Nursing in the School of Health Professions. She holds a BA degree in Nursing, three Master's degrees (MA, MPH, MEM) and a PhD in the field of clinical decision making in an emergency setting. Dr. Saban completed a post-doctoral fellowship in the Department of Health System Management at Ben-Gurion University. She continued her studies in data science with a specialization in machine learning at Bar-Ilan University. Dr. Saban has earned several prestigious prizes, including the Reboot.Forum Prize for supporting HealthCare with Innovation. She is also the head of DataMED Lab, a laboratory that focuses on evaluating the effectiveness of various technologies in the healthcare field, building optimization models to enhance patient care using methods such as GenAI (LLMs and LMMs), NLP and ML, and analyzing clinical decision-making process.

https://www.datamed-lab.sites.tau.ac.il/

Technology in Healthcare

Dr. Mor Saban

Clinical decision making in medicine using AI

Over the years, the importance of clinical decision support systems in medicine have increased as part of the information revolution, the digitalization of the world of medicine, and the development of various technologies. Dr. Saban's research focuses on decision-making processes in the clinical field and the impact of decision support systems on medical decision-making. In recent years, Dr. Saban has been involved in pioneering projects on diagnosing remote life-threatening conditions, such as stroke, using AI-based systems. She has also played a key role in integrating LLMs and LMMs tools into the clinical field (such as ED).

Dr. Dubovi, PhD, is at the Department of Nursing, School of Health Professions. She completed her PhD in Education at the Department of Learning, Instruction and Teacher Education, University of Haifa. She completed two postdoctoral positions, at the Department of Instructional Technology and Learning Sciences at Utah State University, and at the Faculty of Education at Ben-Gurion University of the Negev, Israel.

Technology in Healthcare

Dr. Ilana Dubovi

Educational technology

Digital technologies, including large language models, open new opportunities to leverage healthcare. Dr. Dubovi and her team are exploring how these technologies can foster learning and training for healthcare practitioners as well as patient education. She develops and evaluates various cutting-edge digital technologies, such as virtual reality simulations, online games, computer-based models, interactive visualizations, and more. Using intelligent multi-modal biosensors, Dr. Dubovi's team was first to explore personalized adaptive technology to fine-tune the learning process according to individual needs and engagement flow. This personalized approach ensures that educational content is accessible and fits needs of each learner. The implementation of intelligent educational technologies in digital health is an innovative approach to support both distant patient-clinician encounters and remote healthcare practitioners' training.

Training opportunities

The School of Graduate Studies at the Gray Faculty of Medical & Health Sciences strives for excellence in research and serves as a training platform for Master's programs – M.Sc., M.P.H., M.Occ.H., M.A. - and Doctor of Philosophy - Ph.D. - in diverse biomedical fields. The school is the largest graduate school at Tel Aviv University, with 1050 students, including 500 Ph.D. students, and 550 Masters' students.

The Gray Faculty of Medical & Health Sciences' M.Sc. and Ph.D. students have financial support to undertake research in our laboratories. Tuition and stipend scholarships are available to qualified students, providing a tuition-free degree and living stipend.

We welcome students from abroad, with opportunities for courses in English. While our official spoken language is Hebrew, all laboratory members speak English, providing an international environment.

Prof. Hagit Eldar-Finkelman
Head Graduate School

Prof. Chen Luxenburg
Academic Coordinator,
International Graduate Program

Gray Faculty of Medical & Health Sciences
Tel Aviv University

LIFE IN TEL AVIV

The city of Tel Aviv-Jaffa is a bustling, energetic and dynamic one, with opportunities for sun, exercise, food and socializing like no other place.

Source: Unsplash

For more information please visit https://en-med.tau.ac.il/

Gray Faculty of Medical & Health Sciences

Cover credits

Top: Second and third order olfactory neurons in the Drosophila brain. Hadas Lerner Nussbaum, Moshe Parnas.

Middle left: Manot 1 skull, 55,000 years ago, the mother of modern populations. Israel Hershkovitz.

Middle right: Genetic engineering and fluorescence microscopy in the tnematode C. elegans allows observation of cytoskeletal protein localization and dynamics in adult physiology and embryonic development. Priti Agarwal, Kriti Sethi, Ronen Zaidel-Bar.

Bottom left: Rab5-stimulated fusion that mast cell secretory granules undergo during their biogenesis. Ronit Sagi-Eisenberg.

Bottom right: Recording electrical brain activity during overnight sleep with a high-density (256-channel) EEG system. Yuval Nir.

For more information

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