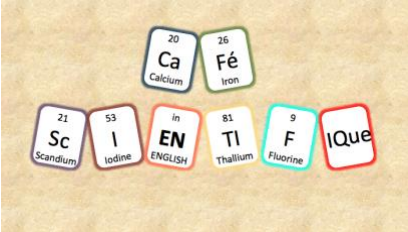


14. January 2019

Where There is No Doctor - A Mobile Health Approach

Universal access to health services is a challenge across the globe due to the lack of trained medical staff, and the increasing cost of health systems. Digital health, and in particular mobile health (mHealth), leverages information and communi-cation technologies (ICT) to decentralize and streamline health services, and facilitate access to basic diagnoses and treatments.

In his talk, Prof. Walter Karlen will present and discuss recent research on developing a new generation of sensor based mHealth solutions to deliver effective medical services anywhere and anytime. Such systems will benefit patients in low-resource and high-end medical settings alike and will be illustrated with research projects conducted in Switzerland and emerging countries.

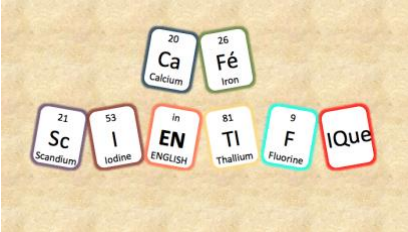
Walter Karlen is an Assistant Professor in the Department of Health Sciences and Techno-logy, ETH Zürich, Switzerland, where he is leading the Mobile Health Systems Lab since 2014. He earned a M.Sc. degree in Micro-Engineering and a Ph.D. in Computer, Communication and Information Sciences from EPFL. Between 2009 and 2014, he was a post-doctoral researcher at the Electrical and Computer Engineering in Medicine research group at the University of British Columbia (UBC) in Vancouver, Canada and at the Biomedical Engineering Research Group at the University of Stellenbosch, South Africa. He is an awardee of the Rising Stars in Global Health program of Grand Challenges Canada (2012), a Killam laureate (2013), and the recipient of a Swiss National Science Foundation professorship (2014). Walter is currently co-leader of the Hochschulmedizin Zurich Flagship SleepLoop project, and manages a number of national and international research projects that aim to improve patient outcomes with intelligent medical systems.

11. February 2019

Inflammaging ... What is it and what are its consequences?

In her talk, Dr. Chocano will address the subject of Inflammation, which can be acute or chronic and is part of our body response to harmful stimuli. As we age, we enter into a stage of chronic inflammation that can affect our risk of acquiring other age-related conditions, including accelerated cognitive decline, and decrease our quality of life. Several factors can affect our chronic inflammatory response, but the most important ones are the ones we can modify, that is diet and physical activity.

Dr. Chocano got her medical degree in Peru and then moved to the USA to study a PhD in Epidemiology with minors in nutrition and biostatistics at the University of Massachusetts Amherst. After finishing her PhD, she was accepted for a postdoctoral fellowship at Harvard School of Public Health, where she worked with the Neuroepidemiology group to evaluate the effects of diet on geriatric depression. Three years ago she moved to Zurich to work as a researcher at the Center of Aging and Mobility, where she is now head of the epidemiology



team and conducts research related to healthy ageing with particular focus on nutrition and inflammation.

4 March 2019

Productive Failure

Our lives are riddled with failures. How one frames these failures influences whether and how one learns from them. Now there is science to help explain how failure can motivate learning, and how one can seek out and design for failure to drive learning. This topic will be discussed in more details by Prof. Manu Kapur.

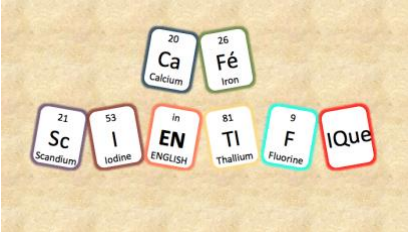
Manu is a professor for learning sciences at ETH Zurich. Before moving to Zurich, he taught and researched in Hong Kong, Singapore, and NYC. He is known worldwide for his research on Productive Failure. For more info: www.manukapur.com.

18 March 2019

Wearable technology: The Holy Grail of Healthcare Innovation?

Soon, the world will have a higher number of older adults than children. In particular, it is projected the increase of life expectancy in European Union will grow from the current 18% up to 28%. This fact alone will put an enormous pressure over the current healthcare system, which has been already suffering skyrocketing costs. The disruptiveness of wearable technology is arising as the new way of vital signs monitoring, and its widespread use integrated within the IoT provide an unified way to monitor the recovery or degradation of elder people at risk. What is exactly wearable technology? Is it as good as it seems? Do we even need doctors anymore? Dr. Delgado's talk will explore these questions and others in this rapidly evolving field.

Ricard Delgado, Ph.D. is the lead research scientist pushing for the digitalization in eHealth within the Swiss Center for Electronics and Microtechnology (CSEM). Trained as a Mathematician and an Engineer, he obtained his Ph.D. on biomedical image analysis from the Swiss Federal Institute of Technology in Lausanne (EPFL) within the SystemsX.ch consortium, the Swiss research initiative for the promotion of Systems Biology. He was awarded with the SSBE Research Award 2013 from the Swiss Society of Biomedical Engineering for the best PhD thesis, and the ABB Award 2014 for his “contributions to the field of bioimage informatics.” His current research focusses on pushing AI into to biomedical embedded systems, wearable technology, and their impact on the future of healthcare and the Medtech industry with more than 40 scientific publications on the topic.



15 April 2019

Engineering Living Tissue: Science or Fiction?

"As Nature's intentions are various, her workmanship is varied accordingly" (William Hunter, 1743). The field of regenerative medicine has emerged in the past two decades as a fundamental branch of medicine, aimed at restoring the function of living tissues. Cartilage, Tendon, Bone, Skin, Muscle, all different tissues with dedicated compositions and functions, which scientists have attempted to reverse engineer and recreate. As the boundary between science and fiction becomes blurred, the advancement of technological capabilities accompanies our growing understanding of the human body. In his talk, Dr. Darwiche will be presenting what goes into the design and restoration of a living tissue and how to redirect the body's own regenerative potential. He will be showing examples from cartilage and skin engineering, highlighting the commonalities as well as the tissue-specific differences. He will also present some of the measures needed to ensure the safe translation of an engineered construct to the patient's bedside.

Dr. Salim Darwiche is a trained bioengineer. He received his engineering training at the University of Pennsylvania in Philadelphia before completing a PhD in Biotechnology and Bioengineering from the Ecole Polytechnique Federale de Lausanne in 2013. He is now a study director at the Musculoskeletal Research Unit at the University of Zürich, working on the design, implementation and management of pre-clinical in vivo studies. His focus is in investigating the biocompatibility and healing capacity of novel engineered medical devices, implants, tissue engineered constructs and cell therapies.

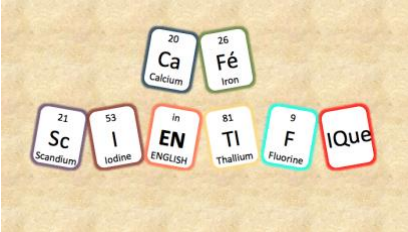
13 May 2019

CRISPR: how bacteria taught us to edit genes

Recent years have witnessed the emergence of a revolutionary technology enabling the editing of genes in cells and organisms with unprecedented efficiency and precision. This technology, known as CRISPR, originates from a bacterial immune system and is based on RNA-guided enzymes that function as programmable scissors for cutting DNA molecules. CRISPR genome editing promises breakthrough advances in biotechnology and in biomedicine, providing a method to correct defective genes causing hereditary diseases. However, the application of this technology in human germline or embryos raises ethical questions for which there currently is no societal consensus. In his talk, Prof. Jinek will provide an overview of the biological origin, technological capabilities, appplications and ethical challenges of CRISPR gene editing.

Martin Jinek is Associate Professor in the Department of Biochemistry at the University of Zurich. His research focuses on two main topics – (i) CRISPR-Cas systems and their genome editing applications and (ii) mechanistic studies of RNA processing and modification pathways in eukaryotic gene expression.

Originally from the Czech Republic, Martin Jinek studied Natural Sciences at the University of Cambridge (UK). In 2006, he received his PhD from the European Molecular Biology



Laboratory (EMBL) in Heidelberg (Germany). He then moved to the University of California in Berkeley (USA) for postdoctoral research with Prof. Jennifer Doudna, where his pioneering work led to the discovery of the biochemical function of the RNA-guided endonuclease Cas9 and was pivotal for establishing the CRISPR-Cas9 genome editing technology.

Since starting his research group at the University of Zurich in 2013, Martin Jinek has studied the molecular mechanisms of CRISPR-Cas genome editor nucleases in atomic detail, providing fundamental insights into their molecular mechanism and contributing to their engineering to drive further development of genome editing technologies.

In recognition of his work, Martin Jinek has received several awards, including an ERC Starting Grant (2013), the EMBL John Kendrew Young Scientist Award (2014) and the Friedrich Miescher Award of the Swiss Society for Molecular and Cellular Biosciences (2015). He is an EMBO Young Investigator, Valle Scholar of the Bert N and L Kuggie Valle Foundation, and in 2017 became an International Research Scholar of the Howard Hughes Medical Institute.

11 June 2019

Superconductivity and Quantum Matter

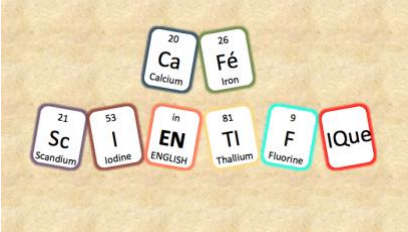
Superconductivity is a fascinating example of a macroscopic quantum matter state that allows dissipation-less transport of electricity. Superconducting materials holds enormous potential for applications in sectors such as medical imaging, power transmission, levitated transport and motors for high-power wind mills. In his talk, Prof. Chang will give a brief history of superconductivity with emphasis on breakthroughs made in the last decade. Although superconductivity emerge as a result of complicated quantum mechanical effects, a layman explanation will be put forward. Finally, an outlook into future developments and applications of superconductivity will be given.

Johan Chang is a professor in experimental condensed matter physics at the university of Zurich. His research is centered around unconventional superconductivity and related quantum matter problems involving correlated electrons. Originally from Denmark, his educational track has led him to work/study in Canada, Japan, France and Switzerland. Currently, Johan Chang's research is based on experiments using light-matter interaction experiments at synchrotron facilities such as the Swiss Light Source.

2. September 2019

From Brain to Behaviour - Connecting behavioral learning in songbirds to how the brain encodes information

Songbirds such as the Zebra Finch (Taeniopygia guttata) are an excellent model species to study the neuroscience of complex, natural behavior. They are the preferred animal model for studying vocal learning, i.e. the process by which animals acquire the vocabulary of vocalizations produced by the adults of their species. Young songbirds begin "babbling" just



like human infants, and develop species specific, structured vocalizations as they grow older. In his talk, Dr. Narula will describe some cool findings from the song learning literature and what kind of problems scientists are interested in. Songbirds are also a highly social species, and during his doctoral research Dr. Narula showed how they can learn to solve complex acoustic tasks by observing each other perform them. His results have implications for both animal and human social learning. Finally, if time permits, the talk will briefly describe more abstract, computational roles played by neuronal circuits in the brain and how they relate to such behaviors as singing and cognitive problem solving.

Gagan Narula is an Indian national and a post-doctoral researcher working at the Neurocritical Care Unit at the University Hospital Zurich. His current research focus is on time series forecasting and unsupervised learning in physiological signals. Gagan holds a Bachelor's degree in Biomedical Engineering and a PhD in Neuroscience from the Institute of Neuroinformatics, ETH Zurich. He has over five years of experience in statistical analysis, cognitive science and machine learning. Apart from neuroscience, Gagan loves performing in plays, playing basketball and writing short stories.

18. November 2019

Forests are Fungi: the Role of Forest Fungi in the Fight Against Climate Change

Forests are fungi. Nearly every tree on Earth forms a partnership with mycorrhizal fungi on their roots. These fungal networks can allow trees in a forest to share resources and work together. However, they can also allow entire forests to compete with other forests partnered with different fungi. In his talk, Dr. Averill will detail how these fungi allow trees to cooperate and compete, and what that means for the ability of forests to sequester CO2 from the atmosphere. Given the huge role these fungi play in sequestering CO2 and slowing climate change, it has never been more important to understand where these different fungi are, and where they will be in the future.

Colin Averill is a senior scientist at ETH Zürich where he leads a research program studying the forest microbiome. Dr. Averill has won multiple awards for his work on this topic, and given scientific presentations all over the world on how to use the forest microbiome to better understand and predict how forests will respond to global change.