



# Science-Switzerland, December 2018 – January 2019

News on Swiss science, technology, education and innovation



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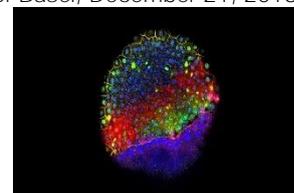
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## «Breakthrough of the Year 2018» for Alex Schier

(University of Basel, December 21, 2018)

Publications of Professor Alex Schier, director of the Biozentrum in Basel, and Professor at Harvard University were named "Breakthrough of the Year 2018" by the magazine Science. He and his team combined various techniques for their work, including the sequencing and mutagenesis of thousands of individual cells. They tracked in detail how tissues and entire animals develop from a single cell. They were able to reconstruct the developmental process of individual embryonic cells for the first time and, in addition, showed that cells can change their path during their maturation process. The title «Breakthrough of the Year» has been awarded annually since 1996 by the magazine Science.

<http://swissinnovation.org/news/web/2018/00-181221-84>



## 50th Birthday of EPFL

(EPFL, January 15, 2019)

Just over fifty years ago, on 1 January 1969, the Ecole polytechnique de l'Université de Lausanne (EPUL) became a Swiss federal institute of technology under the name EPFL. In his New Year's address, President Martin Vetterli touched on EPFL's key milestones over the past half century, and then presented the school's strategy for the coming years. The focus will be on experiential learning, open science, and research on such topics as the energy transition, neurotechnologies and digital trust. "There is no nobler calling than to work for a university like ours," he said, "one that is devoted to the future of our young people and society." Lastly, he provided a preview of some of the events planned for this jubilee celebration.

<http://swissinnovation.org/news/web/2019/00-190115-55>



## Ranking: EPFL Is World's Best Young University

(World Economic Forum, December 25, 2018)

The Times Higher Education (THE) ranking has assessed the best universities under 50 years old, taking into account their teaching, research, international outlook and work with industry, revealing a few that could give their centuries-old counterparts a run for their money. Founded in 1969 and located on the sunny shores of Lake Geneva, EPFL sits in the top spot. It's also placed 12th in the latest QS World University Rankings. The institution scores particularly highly on its international outlook (more than half of its 10,000 students are from abroad). According to the THE, Switzerland is one of the "big global trading hubs" that looks beyond its borders for personnel and ideas.

<http://swissinnovation.org/news/web/2018/00-181225-e5>



## Ranking: Switzerland Leads Global Talent Competitiveness Index

(startupticker.ch, January 22, 2019)

Talent competitiveness, according to the Global Talent Competitiveness Index (GTCI), refers to the set of policies and practices that enable a country to develop, attract, and empower human capital contributing to productivity and prosperity. Switzerland has maintained its top position due to its strong performance across all pillars. It ranks first in the following pillars: Retain Talent, Vocational and Technical Skills and Enable and Growth. It came in at fourth place in the Global Knowledge pillar. The country also performed well in sub-pillars such as Lifelong Learning, Sustainability and Employability. Switzerland's lowest performance this year is the Attract Talent pillar, where it placed fifth. This is due to its weak performances regarding Internal Openness, which includes gender equality variables such as female graduates (85th), gender earnings gap (27th), leadership opportunities for women (20th) as well as social inclusion variables such as tolerance of immigrants (34th).

<http://swissinnovation.org/news/web/2019/00-190122-df>





## 1. Policy

### Distribution of Departments in the New Federal Council

(Der Bund, December 10, 2018)

The distribution of the departments in the new Federal Council is as follows: Viola Amherd is going to be responsible for the Federal Department of Defense, Civil Protection and Sport (DDPS) and Karin Keller-Sutter the Federal Department of Justice and Police (FDJP). Guy Parmelin takes over the Federal Department of Economic Affairs, Education and Research (EAER) from Johann N. Schneider-Ammann and Simonetta Sommaruga takes over the Federal Department of the Environment, Transport, Energy and Communications (DETEC) from Doris Leuthard. Ueli Maurer keeps the Federal Department of Finance (FDF), Ignazio Cassis the Federal Department of Foreign Affairs (FDFA) and Alain Berset the Federal Department of Home Affairs (FDHA).  
<http://swissinnovation.org/news/web/2018/01-181210-39>

### Federal Council to Improve Conditions for Blockchain/DLT

(admin.ch, December 14, 2018)

The Federal Council recently adopted a report on the legal framework for blockchain and distributed ledger technology (DLT) in the financial sector. The report shows that Switzerland's legal framework is well suited to dealing with new technologies, including blockchain. Nevertheless, there is still a need for selective adjustments. The Federal Council also noted the analysis of an interdepartmental working group on the money laundering and terrorist financing risks posed by crypto assets. It is predicted that distributed ledger technology and blockchain technology have considerable potential for innovation and enhanced efficiency both in the financial sector and in other sectors of the economy. The Federal Council wishes to exploit the opportunities offered by digitalization for Switzerland. It wants to create the best possible framework conditions so that Switzerland can establish itself and evolve as a leading, innovative and sustainable location for fintech and blockchain companies.

<http://swissinnovation.org/news/web/2018/01-181214-bd>

## 2. Education

### Switzerland's First Certificates of Open Studies

(EPFL, December 01, 2018)

Switzerland's very first Certificates of Open Studies (COSs) were handed out at a ceremony at EPFL. These certificates were granted to participants who completed a new continuing education program that the school has made available to anyone, with no previous degrees required. The EPFL Extension School currently offers COSs in two areas – Applied Data Science: Machine Learning and Web Application Development. The courses are given online and participants get personalized feedback from their instructors and can request a videoconference. To obtain the certificate, participants must plan, carry out and present a significant individual project showing that they have acquired all the requisite skills.



<http://swissinnovation.org/news/web/2018/02-181201-8a>

### EPFL's Founder Passes Away Aged 101

(EPFL, December 07, 2018)

Maurice Cosandey, EPFL's founder and its president from 1963 to 1978, passed away on Tuesday, 4 December, after a long and full life. "Just as we get ready to celebrate our 50th anniversary next year, the driving force behind the school's transformation into a federal institute – and its first president – has left us in his 101st year. Maurice was a





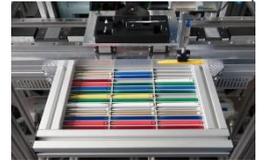
great man who led a very full and inspirational life,” said Martin Vetterli with great sadness. It is thanks to Maurice’s tireless efforts that the school became a federal institute. When he was appointed director of what was then EPUL, he was asked by Vaud State Councilor Pierre Oguey what his strategy would be. His reply left the politician skeptical: “All I can say is that I’ll do everything in my power to turn EPUL into a federal institute.”

<http://swissinnovation.org/news/web/2018/02-181207-d1>

## Industry 4.0 Facility for Demonstration and Learning Purposes

(Zurich University of Applied Sciences, December 11, 2018)

In a production facility of industry 4.0, one hand knows what the other one is doing because all work steps are networked with each other. A learning factory at the Zurich University of Applied Sciences provides an understanding of the new possibilities of industry 4.0. The researchers and master's students from Zurich University of Applied Sciences spend around one and a half years on its construction. Zurich University of Applied Sciences is the first university in Switzerland that has created such a facility for demonstration and learning purposes. By making the latest scientific findings available to students, lecturers and other professionals, the learning factory promotes and accelerates the transfer of knowledge into practice - a win-win situation for industry and academia.



<http://swissinnovation.org/news/web/2018/02-181211-75>

## Strong Female Presence Among New Professors

(ETH Zurich, December 14, 2018)

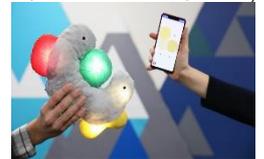
ETH Zurich is setting a strong example for top female talent in science: of the 12 professors appointed by the ETH Board on the recommendation of ETH Zurich President Lino Guzzella, five are women. That amounts to over 40% of the current round of appointments. The new female professors work in a wide range of fields, from plant and environmental sciences, structural physics and the development of materials through to theoretical cosmology. “I am delighted and proud that ever more highly talented female scientists are succeeding at our extremely competitive process for appointing professors,” says Lino Guzzella. “This also shows that ETH Zurich’s long-term efforts to promote female talent are bearing fruit. Greater diversity brings different perspectives to every research field.” He is convinced that this will also have a positive effect on academic quality, “and ultimately on the success of ETH as a whole.”

<http://swissinnovation.org/news/web/2018/02-181214-82>

## China Hardware Innovation Camp for Swiss Students

(EPFL, December 21, 2018)

For the China Hardware Innovation Camp (CHIC), EPFL Master’s students spend 14 months sketching out an idea for a connected device, then travel to China to manufacture a prototype. This gives them a chance not only to experience the entire product development process from design to production, but also to discover the Hong Kong and Shenzhen innovation hub, one of the world’s most vibrant technology and prototyping ecosystems. The program brings together students from EPFL, HEC Lausanne and ECAL, who team up to design original connected devices that could be of genuine interest to consumers. The three prototypes developed during the 2018 CHIC were presented in Renens in mid-December at an event open to the public.



<http://swissinnovation.org/news/web/2018/02-181221-7d>

## Psychology Students Become Online Coaches

(Zurich University of Applied Sciences, December 27, 2018)

In a Zurich University of Applied Sciences master's program, prospective psychologists learn how to advise their clients "at distance". "Distance counseling is suitable for all types of counseling - from anonymous AIDS counseling to management coaching and psychotherapy," stresses Hansjörg Künzli. In the course the communication platform "CAI Coaching World", which combines (video) telephony, chats and shared work surfaces with the forms of distance consulting that are already common today, such as e-mail advice, is taught to use. In addition, the master students are brought up to date with the latest research, which Silvia Deplazes summarizes in this way: "Research shows that distance counseling has the same effect as personal consultation on the ground." Legal aspects such as data security and personal protection are taught in the master course.



<http://swissinnovation.org/news/web/2018/02-181227-78>

## Issue of Social Selectivity in Education System

(The Swiss Science Council, December 28, 2018)

In Switzerland, educational pathways and the acquisition of qualifications can be predicted with a high probability with minimal information about socio-economic resources and the education level of parents. The Swiss Science Council has been concerned with the phenomenon of the so-called social selectivity for several years. In particular, the associated negative effects on individual educational pathways, the national economy and the Swiss education, research and innovation system pose urgent problems for the Council. As the latest data from the Federal Statistical Office and the Swiss Education Report 2018 show, social inequalities are not reduced by the education system but rather reproduced. The Council is concerned that, despite clear data, the issue of social selectivity is still not adequately addressed at the policy level. The Council therefore sees an urgent need for action.

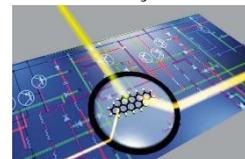


<http://swissinnovation.org/news/web/2018/02-181228-c2>

## "Reverse MBA": Learning about Technologies and Underlying Science

(ETH Zurich, January 22, 2019)

"Professionals with an engineering or scientific background often acquire the economic foundations in an MBA program for a career step into middle and upper management," explains ETH Zurich Rector Sarah Springman. "For people with an education in the social or economic sciences, there has been a lack of opportunities to acquire the technological foundations that will enable them to pursue a similar career". Against this background, ETH Zurich has developed a continuing education program in cooperation with Swissmem, the Swiss Engineering Federation, and representatives of high-tech companies such as ABB and Ruag. Springman describes the new program as a kind of "reverse MBA". The "Master of Advanced Studies ETH in Applied Technology" is intended to acquaint participants with the most important technologies and the underlying scientific principles and to show them future trends.



<http://swissinnovation.org/news/web/2019/02-190122-73>

### 3. Life Sciences / Health Care

#### Statins Overprescribed for Primary Prevention

(University of Zurich, December 06, 2018)

When deciding whether to prescribe statins to a patient, doctors use a number of risk factors such as cholesterol level, BMI and smoking to determine the likelihood of a person suffering a heart attack or stroke in the next 10 years. If this figure reaches or exceeds 10%, many medical guidelines recommend the use of statins. If these guidelines, most of which are drawn up by cardiology organizations, are to be believed, more than one third of all people between the age of 40-75 would have to take statins as a preventive measure. However, these guidelines do not properly take into account the unwanted side effects (muscle pain, cataracts, liver defects or diabetes). Researchers at University of Zurich have therefore carried out a comprehensive statistical modeling study, which shows that statins are recommended too often. The newly set thresholds could cut the number of people who are given a recommendation to take statins by half.

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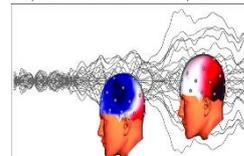


#### More Focused Attention to Threatening Voices

(University of Geneva, December 07, 2018)

Sight and hearing are the two main sensory modalities allowing us to interact with our environment. But what happens within the brain when it perceives a threatening signal, such as an aggressive voice? How does it distinguish a threatening voice from the surrounding noise? How does it process this information? To answer these questions, researchers from the University of Geneva studied brain activity during the processing of various emotional voices. They discovered that we notice a voice much faster when it is considered threatening than when it is perceived as normal or happy. Our attention is more focused on threatening voices to enable us to clearly recognize the location of the potential threat. This study demonstrates the resources leveraged by our brain when we sense danger to allow for adequate survival behavior.

<http://swissinnovation.org/news/web/2018/03-181207-c4>



#### Using Water Molecules to Unlock Neurons' Secrets

(EPFL, December 11, 2018)

Researchers at EPFL developed a way of tracking electrical activity in neurons simply by looking at the interactions between water molecules and the neural membranes. "Neurons are surrounded by water molecules, which change orientation in the presence of an electric charge," says Sylvie Roke. "When the membrane potential changes, the water molecules will re-orient – and we can observe that." The researchers altered the neuronal membrane potential by subjecting the neurons to a rapid influx of potassium ions. This caused the ion channels on the neurons' surface (which serve to regulate the membrane potential) to open and let the ions through. They then turned off the flow of ions, and the neurons released the ions that they had picked up.

<http://swissinnovation.org/news/web/2018/03-181211-45>



#### Combatting the Overuse of Antibiotics

(ETH Zurich, December 14, 2018)

Thomas Van Boeckel is a Branco Weiss Fellow. His postdoctoral research at the Institute of Integrative Biology at ETH Zurich focuses on the overuse of antibiotics in animal husbandry in different parts of the world. His first project is to produce a global map of antimicrobial resistance in order to give us a better idea of the scale of the problem. He is also investigating which potential interventions would be most effective in reducing



antimicrobial consumption. According to him, the problem of antimicrobial resistance can only be solved if researchers share their knowledge with politicians and business leaders. He has already been invited to speak to the EU and UK parliaments.

<http://swissinnovation.org/news/web/2018/03-181214-41>

## Drug Against Neglected Tropical Disease

(University of Basel, December 18, 2018)

Buruli ulcer, a neglected tropical disease, is a debilitating and stigmatizing disease. Affecting mainly children in West and Central Africa, the chronic disease results in devastating skin lesions and can lead to permanent disfigurement and long-term disabilities. Buruli ulcer is caused by *Mycobacterium ulcerans* which belongs to the same family of bacteria that cause tuberculosis (TB) and leprosy. *M. ulcerans* is found in the environment and, despite considerable research efforts, the mode of transmission of the bacteria to humans remains unclear. Researchers from the Swiss TPH, which is associated with the University of Basel, together with partner institutions such as the Nanyang Technological University, have discovered a promising compound against Buruli ulcer. They found that compound Q203 (an imidazopyridine amide) is highly effective against Buruli ulcer, both in vitro and in vivo.



<http://swissinnovation.org/news/web/2018/03-181218-9b>

## Harmonizing Fossil-Based and Phylogenetic Analysis

(ETH Zurich, December 18, 2018)

Scientists look to fossils and evolutionary trees to help determine the rate of evolution – albeit with conflicting results. The speciation and extinction rates derived from the fossil record are often much higher than those calculated through phylogenetic methods. To date, it has been unclear what was responsible for this discrepancy. A new model developed by ETH Zurich researchers has helped to resolve this contradiction. This model not only helps to harmonize the results of fossil-based and phylogenetic analysis but also provides indications as to which speciation mechanism predominated in a particular animal or plant group.



<http://swissinnovation.org/news/web/2018/03-181218-0b>

## Virus Depicting Swiss History

(University of Bern, December 19, 2018)

In order to better combat the worldwide cattle disease BVD (bovine viral diarrhoea) in Switzerland, researchers from the University of Bern have created a database of BVD viruses. They discovered that the two largest Swiss cattle breeds were infected by two different virus types. Thanks to the help of historians, they found that this spread was due to a religious power struggle in the 15th century. "Thinking outside the box was very productive in our study," says Ernst Peterhans from University of Bern. "We were able to show that a conflict over three popes has affected the distribution of genetically different viruses in cattle." What began as a purely virological study took a surprising turn and developed into a study with a political and economic background.

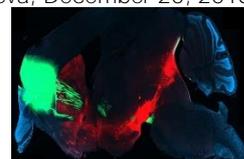


<http://swissinnovation.org/news/web/2018/03-181219-de>

## Addiction Circuit in Drug Abuse

(University of Geneva, December 20, 2018)

What happens in the brain of a compulsive drug user? What is the difference in brain function between an addict and a person who takes a drug in a controlled manner? In an attempt solve this puzzle, neurobiologists at the University of Geneva have been looking at this difference in a rodent addiction model. They have discovered that the brain circuit connecting the decision-making region to the reward system is stronger in compulsive animals. The researchers also found that by decreasing the activity of this circuit, compulsive mice



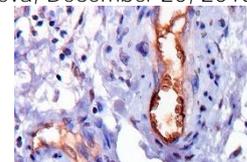
were able to regain control and that conversely, by stimulating the connection a mouse that initially remained in control became addicted.

<http://swissinnovation.org/news/web/2018/03-181220-01>

## Cutting Power of Tumors

(University of Geneva, December 20, 2018)

Instead of tackling tumors head-on, an international team of researchers from the University of Geneva and the Amsterdam Academic Medical Center, location VUmc, has chosen to regulate their vascularization by intervening with cellular receptor that is overexpressed specifically in cancer blood vessels. By acting on the development of the blood vessels within the tumor, the scientists hope to modulate vasculature and deliver the treatments extremely accurately, and even if necessary «cut the food» to the tumor, much like you would close a tap.

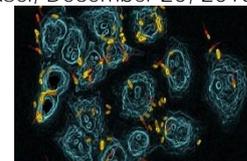


<http://swissinnovation.org/news/web/2018/03-181220-d4>

## Colonization Strategy of Pathogens

(University of Basel, December 20, 2018)

The pneumonia causing pathogen *Pseudomonas aeruginosa* has developed a twin-track strategy to colonize its host. It generates two different cells, motile spreaders and virulent stickers. Researchers at the University of Basel have now elucidated how the germ attaches to tissue within seconds and consecutively spreads. Just like the business model: settling – growing – expanding. The researchers speculate that this colonization strategy is of a general nature and can be found in a wide variety of bacteria that effectively colonize different surfaces such as stones, shower curtains, coffee cups or human organs.



<http://swissinnovation.org/news/web/2018/03-181220-b0>

## Statin Reduces Brown Adipose Tissue

(ETH Zurich, December 20, 2018)

A certain proportion of the adult population has not only white adipose tissue, but also the brown kind. People with brown adipose tissue are better at regulating their body temperature in the winter and are less likely to suffer from excess weight or diabetes. Researchers from the ETH Zurich have now discovered that statin reduces the formation of brown adipose tissue. Statins are prescribed to reduce cholesterol levels in the blood. The researchers insist that these findings are no reason to demonize these drugs. Rather, further research should be conducted to reveal the mechanisms behind and find out which patients are affected. It might then be possible to take a personalized medicine approach.



<http://swissinnovation.org/news/web/2018/03-181220-aa>

## Brain Learns by Talking to Itself

(University of Geneva, January 02, 2019)

Human beings, like other animals, possess an enormous learning capacity that allows for the apprehension of new sensory information to master new skills or to adapt to an ever-changing environment. However, many of the mechanisms that enable us to learn remain poorly understood. One of the greatest challenges of systems neuroscience is to explain how synaptic connections change to support adaptive behaviors. Neuroscientists at the University of Geneva previously showed that synaptic learning mechanisms in the brain's cortex are dependent on feedback from deeper brain regions. They have now precisely deciphered how this feedback gates synaptic strengthening by switching on and off particular inhibitory neurons. This study not only constitutes an important milestone in our understanding of the mechanisms for perceptual learning but may also offer insight into computerized learning systems and artificial intelligence.



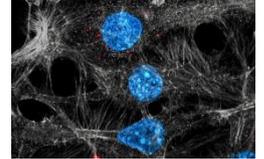
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## Tumors Backfire on Chemotherapy

(EPFL, January 02, 2019)

Some patients with breast cancer receive chemotherapy before the tumor is removed with surgery. This approach, called 'neoadjuvant' therapy, helps to reduce the size of the tumor to facilitate breast-conserving surgery. But not all tumors shrink under chemotherapy. If the tumor resists neoadjuvant therapy, there can be a higher risk of developing metastatic disease, meaning that the tumor will recur in other organs. This could be due to cancerous cells that resist chemotherapy and spread to other organs while the primary tumor is being treated. An international team of scientists at EPFL has shed new light into this process. Importantly, the researchers found that neutralizing annexin-A6 or blocking monocytes during chemotherapy prevents the experimental mammary tumors from metastasizing to the lung. These results may help to improve the efficacy and safety of neoadjuvant chemotherapy.



<http://swissinnovation.org/news/web/2019/03-190102-54>

## Change of Teeth Causes Yo-Yo Effect in Elephants' Weight

(University of Zurich, January 09, 2019)

The teeth of most mammals are replaced once in a lifetime. But elephants increase greatly in size and weight over the course of their lives and therefore, one single change of teeth would not be enough for the enormous growth of the jaw. That is why the teeth of elephants are replaced a total of five times over their lifespan. On each side of the jaw they have only one single tooth in use at a time which is slowly pushed forwards by a new bigger tooth. As a result, the elephants' chewing surface gets bigger when two teeth are present on one side at the same time, and then smaller again when there is only one tooth on each side. Researchers at the University of Zurich have now observed weight fluctuations in elephants living in zoos, which can be explained by these changes.



<http://swissinnovation.org/news/web/2019/03-190109-71>

## Minimizing Side Effects of Chemotherapy

(University of Zurich, January 10, 2019)

Most patients who need chemotherapy worry about side effects. The cause of the side effects is a receptor in the brain which is activated by the neurokin1 receptor, which is overstimulated during chemotherapy. Since its discovery, teams worldwide have worked on finding effective and lasting inhibitors. But while many compounds showed strong activity in the test tube, few worked in patients. Researchers at University of Zurich have now found a solution: They examined what the three-dimensional structure of the receptor looked like when two effective drugs were used. They compared this with the use of an early compound that was only active in the test tube. "We could directly see how the effective drugs altered some parts of the receptor such that the drugs could not easily escape anymore," explains Jendrik Schöppe. "The earlier compound fit just as well onto the receptor but could still quickly leave it."



<http://swissinnovation.org/news/web/2019/03-190110-42>

## Drug Against Formation of Metastasis

(University of Basel, January 10, 2019)

Circulating tumor cells (CTCs) are cancer cells that leave a primary tumor and enter the bloodstream, on their way to seeding distant metastases. These so-called CTCs can be found in the blood of patients as single cells or cell clusters. CTC clusters are the precursors of metastases. Researchers at the University of Basel have discovered that CTC cluster formation leads to key epigenetic changes that facilitate metastasis seeding. These changes enable CTC clusters to mimic some properties of embryonic stem cells, including their ability to proliferate





while retaining tissue-forming capabilities. The scientists have also shown that these epigenetic changes are fully reversible upon the dissociation of CTC clusters.

<http://swissinnovation.org/news/web/2019/03-190110-3b>

## ncRNA Turbocharger for Cell Apparatus

(University of Bern, January 10, 2019)

Recently, researchers at the University of Bern discovered an unusual mechanism: an ncRNA molecule that acts as a kind of stimulant for ribosomes and that is produced during stress. This finding astonished the researchers because until now only the opposite function of non-coding RNA had been known, acting as inhibitors for the cell apparatus. During stress, ncRNA molecules attach to ribosomes, pushing the emergency stop button of the protein machinery. When nutrients become scarce or environmental conditions become especially challenging, the entire assembly line is shut down, saving time for the cell. ncRNA molecules are predestined for such a regulatory mechanism - they are produced within fractions of minutes and can thus lead to a much faster reaction of the cell than via the detour of a protein.



<http://swissinnovation.org/news/web/2019/03-190110-5e>

## Potential for Risky Behavior Is in Genes

(University of Zurich, January 14, 2019)

If we compare two people's DNA, we see that over 99% of it is identical, and less than 1% of their strands vary. These unlike areas are called genetic variants and are the basis for genetic differences in every human trait such as the color of your eyes, your height, or your propensity to illnesses. While some of these links directly influence a handful of human traits, the vast majority are just predispositions, making an outcome more, or less likely. Scientists at University of Zurich identified 124 previously unknown genetic variants within 99 areas of the human genome, which are associated with a person's willingness to take risks. In order to determine which genetic variants mattered, the researchers took into account the self-reported basic risk tolerance of almost one million people and their level of risky behavior (i.e. smoking, drinking, speeding, changing sexual partners).

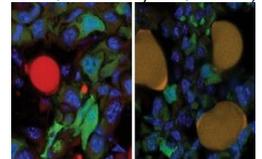


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## Conversion of Breast Cancer Cells into Fat Cells Reduces Formation of Metastases

(University of Basel, January 14, 2019)

Tumor cells can adapt dynamically to changing conditions thanks to their ability to reactivate a cellular process that is central to embryonic development. This allows the cells to alter their molecular properties and to acquire new capabilities. Malignant cancer cells exhibit a high degree of adaptability (referred to as plasticity) as they undergo this process. Now, researchers at University of Basel have exploited this property in order to develop a new type of therapeutic approach. In experiments on mice, they have succeeded in using a combination of two active substances to convert breast cancer cells, which divide quickly and form metastases, into fat cells that can no longer divide and can barely be differentiated from normal fat cells. This stops the tumor from invading the neighboring tissue and blood vessels, and no further metastases can form.

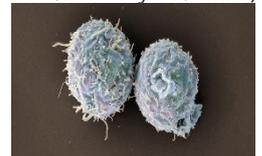


<http://swissinnovation.org/news/web/2019/03-190114-9b>

## Engineered Immune Cells Promote Organ Transplant Acceptance

(University of Basel, January 15, 2019)

When someone is confronted with 'foreign' material, be it viruses, bacteria, fungi, but also donor organs following transplantation, immune cells called T cells come into action to inactivate and destroy the 'foreign' material. Researchers at University of Basel together with collaborating scientists have now described a way to selectively suppress





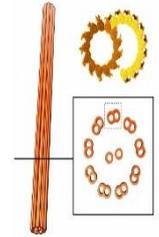
the immune reaction of the body against the donor organ by modulating the protein coronin 1. By blocking this protein in T cells, these immune cells do not attack the transplanted organ anymore. However, the T cells continue to keep viruses, bacteria and fungal infections in check. These findings could potentially provide new approaches for reducing graft rejection in the future.

<http://swissinnovation.org/news/web/2019/03-190115-60>

## Forming of Cellular Antennas

(University of Geneva, January 17, 2019)

Most of our cells contain an immobile primary cilium, an antenna used to transfer information from the surrounding environment. Some cells also have many mobile cilia that are used to generate movement. The 'skeleton' of the cilium consists of microtubule doublets, which are 'pairs' of proteins essential for their formation and function. Defects in the assembly or functioning of the cilia can cause various pathologies called ciliopathies. Scientists from the University of Geneva have developed an in vitro system capable of forming microtubule doublets and have uncovered the mechanism and dynamics of their assembly. Their study reveals the crucial role of tubulin, a real building block, in preventing the uncontrolled formation of ciliary structures. This method will make it possible to discover and exploit possible differences between the cilia of human cells and those of pathogens, allowing for the development of new treatments.



<http://swissinnovation.org/news/web/2019/03-190117-c6>

## Prevention of Formation of Supernumerary Heads

(University of Geneva, January 18, 2019)

The freshwater Hydra is able to regenerate any part of its body to rebuild an entire individual. The small polyp has a development organizer center located at the head level, and another in the foot. The head organizer performs two opposite activities, one activating, which causes the head to differentiate, and the other inhibiting, which prevents the formation of supernumerary heads. Researchers at the University of Geneva have discovered the identity of the inhibitor, a protein called Sp5, and deciphered the dialogue between these two antagonistic activities, which helps maintain a single-headed adult body and organize an appropriate regenerative response. Their study points out that this mechanism has been conserved throughout evolution, both in Hydra and in humans. Sp5 could therefore be an excellent candidate to be tested as an inhibitor of human tumors in which the activator pathway is the motor of proliferation.



<http://swissinnovation.org/news/web/2019/03-190118-66>

## Testing of Antibody Against Ebola Outbreak

(Università della Svizzera italiana, January 25, 2019)

A Phase 1 clinical trial to test the safety of an antibody to use against Ebola outbreak has been successfully concluded by the National Institutes of Health Clinical Center in Bethesda (USA). The treatment is based on the monoclonal antibody mAb114, which was isolated and characterized in Switzerland at the Institute for Research in Biomedicine (IRB Bellinzona, affiliated to USI Università della Svizzera italiana) in collaboration with several partners. The results reveal that mAb114 appears to be safe, well tolerated, and easy to administer. The researchers note several potential advantages for deploying mAb114 in an outbreak setting, including the ease and speed of its administration, and its formulation as a freeze-dried powder that does not require freezer storage. The powder is reconstituted with sterile water and added to saline for administration.



<http://swissinnovation.org/news/web/2019/03-190125-88>

## 4. Nano / Micro Technology / Material Science

### Achieving Nanometric Resolution in Optical Microscopy

(University of Geneva, December 17, 2018)

Cells are made up of tiny compartments, organelles, which have precise structures and roles. Being able to observe these structures represents an enormous challenge and would allow a better understanding of cellular functioning. However, until now, fluorescence microscopy did not offer sufficient resolution to obtain a detailed visualization of the ultrastructure of organelles. Researchers at the University of Geneva have succeeded in enlarging biological samples without deforming them and revealing details at a nanometric scale, that is to say a millionth of a millimeter, an unsurpassed resolution in optical microscopy. This new technique makes it possible to visualize the architecture and composition of organelles, as well as those of protein complexes of various types. The magnifying glass effect obtained even allows to detect biochemical modifications on components of these complexes, which can be used for mapping purposes.

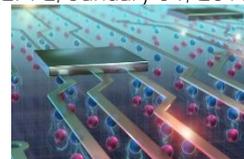


<http://swissinnovation.org/news/web/2018/04-181217-6e>

### Excitons Pave Way to more Efficient Electronics

(EPFL, January 04, 2019)

A research team at EPFL was the first to control exciton flows at room temperature. And now, the same team has taken their technology one step further. The scientists combined tungsten diselenide (WSe<sub>2</sub>) with molybdenum diselenide (MoSe<sub>2</sub>), both are 2D materials, to reveal new properties with an array of possible high-tech applications. By using a laser to generate light beams with circular polarization, and slightly shifting the positions of the two 2D materials to create a moiré pattern, they were able to use excitons to change and regulate the polarization, wavelength and intensity of light. This can lead to a new generation of electronic devices with transistors that undergo less energy loss and heat dissipation. The scientists' discovery forms part of a new field of research called valleytronics.



<http://swissinnovation.org/news/web/2019/04-190104-c1>

### Cartilage from 3D-Printer with Nanocellulose

(Empa, January 15, 2019)

Cellulose obtained from wood has amazing material properties. Empa researchers are now equipping the biodegradable material with additional functionalities to produce implants for cartilage diseases using 3D printing. "In viscous state cellulose nanocrystals can easily be shaped together with other biopolymers into complex 3-dimensional structures using a 3D printer, such as the Bioplotter", explains Michael Hausmann Empa. Once cross-linked, the structures remain stable despite their soft mechanical properties. The researchers are currently investigating the characteristics of the nanocellulose composite hydrogels in order to further optimize their stability as well as the printing process. They already used X-ray analysis to determine how cellulose is distributed and organized within the printed structures.



<http://swissinnovation.org/news/web/2019/04-190115-1b>

### Fireproofing Made of Recycled Paper

(Empa, January 22, 2019)

Scientists at Empa teamed up with isofloc AG to develop an insulating material made of recycled paper. It is ideal for prefabricated wooden elements and even multistory timber houses and protects the construction against fire. The secret lies in what the recycled paper fiber cube does not do: crumble. This very property is important to offer long-term protection against fire for load-bearing elements. This firmness is hard to achieve in the industrial production. "[...] the recycled paper fibers are automatically blown into a cavity until it is filled





completely”, explains Franziska Grüneberger. For reasons of cost, this blowing has to take place as easily and as fast as possible, which is why the fibers need to flow well at this point. As soon as they are in the cavity, however, they should keep their shape to protect the construction in case of a fire.

<http://swissinnovation.org/news/web/2019/04-190122-45>

## 5. Information & Communications Technology

### Drones to Change Film Industry

(ETH Zurich, December 05, 2018)

Drones are going to change the film industry in a major way. Researchers from the ETH Zurich and the Delft University of Technology have developed a system that consists of two commercially available drones and a laptop. The drones follow the actor's every move and automatically adjust their position so that the target can always be shot from two angles. This reduces the amount of camera work required. Impressively, the system anticipates the actor's movements in real-time and then calculates where the drones need to fly in order to keep the actor in the frame. Now, the challenge is to continue developing the system for practical applications. Tinamu Labs, a start-up company, is planning to tackle this task.



<http://swissinnovation.org/news/web/2018/05-181205-21>

### Artificial Intelligence for Environment Monitoring

(University of Geneva, December 13, 2018)

Microorganisms perform key functions in Earth's ecosystems. Their diversity reflects the health of an environment and the identification of microbial communities can be used as powerful diagnostic tool to detect pollution or diseases. Researchers from the University of Geneva have developed a novel approach to explore the biodiversity and thus the condition of an ecosystem. They combined genomic tools to sequence the DNA of microorganisms in samples – making it possible to very accurately describe the biological communities inhabiting an environment – and then exploited this amount of data with artificial intelligence. This enabled them to build predictive models capable of diagnosing the health of ecosystems on a large scale and identifying species that perform vital functions. The model will be further refined and validated over time.



<http://swissinnovation.org/news/web/2018/05-181213-7a>

### Algorithms Take the Wheel

(ETH Zurich, December 16, 2018)

Car sharing with autonomous vehicles could improve cities by offering an efficient public transport system, reducing traffic and making it safer. Today, private cars are used just 5 percent of the time on average, which means the cars spend most of the time standing idle in the street – nonsense in terms of sustainability, urban development or resource efficiency. Singapore is taking a pioneering role in the development of autonomous fleets, working with researchers from ETH Zurich to explore the potential of personalized, electrified and automated public transport. More than ten companies are currently testing their systems in a facility at Nanyang Technological University. In 2022, the first self-driving buses are planned to operate in three of the city's suburbs.



<http://swissinnovation.org/news/web/2018/05-181216-bf>



## Laboratory Work Made More Efficient

(ETH Zurich, January 08, 2019)

“A bioscientist’s daily routine can be very boring and tiring”, says Oskari Vinko, who did his Master's in biotechnology at ETH Zurich. “A lot of time is wasted on repetitive work: For example, researchers have to fill pipettes with liquid, take measurements and record the results.” Were the processes to be automated, scientists would have extra time for the more demanding parts of their job, such as planning experiments, analyzing data and testing new ideas. Therefore, Oskari Vinko and Maximilian Schulz founded the ETH Zurich spin-off UniteLabs. They produce software to automate life science laboratory processes, enabling machines to take over the laborious and time-consuming work. They program the software together with the client, so it is designed specifically for their experiments.



<http://swissinnovation.org/news/web/2019/05-190108-33>

## Warning System for Diabetics on the Road

(University of St. Gallen, January 18, 2019)

Hypoglycemia can constitute a serious acute complication of a diabetes mellitus that is treated with insulin or certain other drugs. Hypoglycemia diminishes concentration, slows down perception and thought processes, and impairs numerous psychomotor functions. This is particularly critical on the road, where rapid decision-making sequences that integrate numerous factors are indispensable. Now, researchers from University of St. Gallen, together with researchers from Inselspital Bern and ETH Zurich, will work together for an innovative research project at the interface between diabetes and modern automotive technology. The team of researchers intends to detect hypoglycemia directly from the data recorded by the vehicle on the road in real time.



<http://swissinnovation.org/news/web/2019/05-190118-40>

## Security Flaws Uncovered in Blockchain Platform

(ETH Zurich, January 21, 2019)

After bitcoin, digital currency ether is the second most widespread cryptocurrency. However, Ethereum, the blockchain platform that supports ether transactions, has a few technological advantages over the market leader. Ethereum offers the option of linking the transactions to contractual conditions in what are known as smart contracts. Ethereum had a regular upgrade scheduled for the middle of January but this was stopped at the last minute following an alert from ETH Zurich spin-off ChainSecurity. Hubert Ritzdorf, Chief Technology Officer at ChainSecurity and former ETH Zurich doctoral student, realized that the upgrade would open up a security loophole. He informed the Ethereum core team, which immediately halted the upgrade. “If the upgrade had gone ahead as planned, malicious users could have attacked certain contracts and then been able to raid the accounts of other users,” Ritzdorf explains.



<http://swissinnovation.org/news/web/2019/05-190121-1d>

## 6. Energy / Environment

### Water Treatment Plants Tackle Micropollution

(Eawag, December 03, 2018)

With the decision to upgrade around 100 water-treatment plants (WTP) with an additional purification stage for eliminating micropollution, Switzerland is an international pioneer in the water protection field. In the framework of the EcolImpact research project, molecular, physiological and ecological parameters in 24 selected stretches of streams have been recorded in the Swiss Central Plateau and in the Jura. Data of the Herisau WTP have turned out to be particularly interesting. During the research work, this WTP was upgraded with an additional purifying stage designed to eliminate micropollution. The findings showed that before the upgrade, one gram of gammarids contained nearly forty nanograms of trace substances, whereas afterwards none could be detected.



<http://swissinnovation.org/news/web/2018/06-181203-df>

### Increasing Crop Insurances Adoption in Developing Countries

(University of Zurich, December 04, 2018)

For decades, companies, aid organizations and governments in developing countries have tried to increase the numbers of farmers who insure their crops. However, farmers' adoption remains stubbornly low. Researchers at University of Zurich identified a simple solution to increase the take up rates of these insurance. Usually, crop insurances have to be paid at the beginning of the season, just as the farmers need money for inputs, seeds, machinery and to feed their family until harvest, when they can sell their produce. The researchers shifted the payment date for the insurance to harvest time. In case of a good harvest, the farmer received the price for his harvest from which the insurance premium was deducted. In case of a bad harvest, the farmer received a price for his harvest and an insurance payout. The researchers tested this innovation through a randomized controlled trial and increased the pick-up rate for the insurance from 5% to 72%.



<http://swissinnovation.org/news/web/2018/06-181204-cb>

### Rhubarb Juice as Natural Antioxidant

(Zurich University of Applied Sciences, December 04, 2018)

For the first time rhubarb juice was used as a natural antioxidant in the industrial processing of fruits. Researchers at Zurich University of Applied Sciences, together with the industrial partner Agrofrucht-Inn, made apple chips and frozen apples to last longer on a natural basis. While the conventionally with ascorbic acid treated fruits have gotten brown after a few hours, the with rhubarb juice treated fruits were permanently protected from oxidation. "This gives the industry a great advantage in time-critical processes and makes rhubarb juice particularly interesting in convenience products, dried fruit, frozen fruit or fruit juices, but also in salad slices," says Martin Häfele from Zurich University of Applied Sciences. The research project is supported by the Association of Swiss Vegetable Producers and the Swiss Fruit Association.

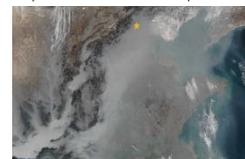


<http://swissinnovation.org/news/web/2018/06-181204-35>

## Less Smog, Thus More Solar Power

(ETH Zurich, December 06, 2018)

China has begun to introduce strict measures to combat air pollution, and the government has invested in emission-free solar power and plans to expand photovoltaic systems. But air pollution is still high, and the smog not only threatens human health but also reduces the power output of existing photovoltaic systems. Model calculations by ETH Zurich researchers now show that solar power production could increase massively – 85 to 158 TWh of additional electricity per year by 2040 – if China fought smog more vigorously. The team also calculated the cost of introducing best-practice emission standards in all sectors of the economy. They found that the revenue from increased photovoltaic generation could cover 13 to 17 percent of the cost of the stringent air pollution control measures necessary to achieve the zero-emission target.

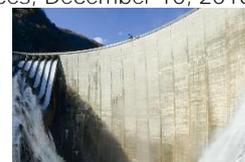


<http://swissinnovation.org/news/web/2018/06-181206-bd>

## Economic View on Governmental Energy and Climate Policy

(Zurich University of Applied Sciences, December 10, 2018)

The Swiss Energy Strategy 2050 pursues a secure and economic energy supply with renewable energy sources. The measures of the federal government's energy and climate policy are examined by a study commissioned by the Zurich University of Applied Sciences from an economic point of view on behalf of the umbrella organization for renewable energies and energy efficiency AEEUSISSE. The study reveals potential for improvement and makes suggestions for adapting the current market rules and laws. The researchers propose, for example, a grant that is equally designed for all renewable energies. The support should be based on the costs of the cheapest technologies needed to meet the expansion targets of renewable energies. In contrast to today's technology-based funding, this would promote competition between renewable energies. In addition, the support measures should be aligned more clearly with the political goals.



<http://swissinnovation.org/news/web/2018/06-181210-4d>

## Resistance Genes in Wastewater Treatment Plants

(Eawag, December 12, 2018)

Antibiotic resistance genes are not completely eliminated by wastewater treatment. While some resistance genes are present in the influent, many others are found in activated sludge bacteria. A recent Eawag study shows that, rather than merely passing through, resistance genes are active and evolve within treatment plants. Results suggest that substantial exchanges of resistance genes occur between human pathogens and other bacteria. The easiest way of preventing this, is to eliminate biomass as far as possible from the water. A contribution to this goal will be made by the new treatment steps designed to remove micropollutants, which are to be introduced at Swiss wastewater treatment plants over the coming years.



<http://swissinnovation.org/news/web/2018/06-181212-e7>

## Cress Plants Against Heavy Metal Contamination

(Swiss Federal Institute for Forest, Snow and Landscape Research, December 13, 2018)

According to a study conducted by the Swiss Federal Institute for Forest, Snow and Landscape Research together with the Polish Academy of Sciences, plants could be used to clean soils from lead, zinc, or cadmium contaminations. The scientists found striking evidence for this in the genome of thale cress (*Arabidopsis halleri*). If the plant grows on heavily contaminated soil, it evolves to possess the ability to store heavy metals in its cells – in the vacuoles, to be precise – and render them harmless. A better understanding of these mechanisms could help breeding particularly resistant plants, which can serve to remediate contaminated sites systematically.



<http://swissinnovation.org/news/web/2018/06-181213-90>

## Sustainable Use of Soil Resources

(University of Bern, December 17, 2018)

The National Research Program "Sustainable Use of Soil Resources" (NRP 68) investigated the effects of agriculture and forestry on soil quality. In an experiment lasting several years, researchers observed how soil regenerated after it had been compacted by a tractor. They found that one single incident of compaction reduces yields for more than a decade. The NRP 68 proposes various measures to safeguard soil quality in Switzerland in the long term. One of its proposals is that spatial planning decisions should take account of soil quality. The researchers therefore developed soil index points to enable them to quantify soil quality. The NRP 68 also recommends improving coordination at the administrative level and making decision makers more aware of soil-related issues.



<http://swissinnovation.org/news/web/2018/06-181217-8b>

## Forest Exposure Remains High Despite Ozone Decrease

(Swiss Federal Institute for Forest, Snow and Landscape Research, December 18, 2018)

While stratospheric ozone is essential for life on Earth, it is harmful when too much ozone is in the air we breathe. The planet's flora, too, suffers from excessively high ozone levels. It can affect tree growth and a forest's water metabolism and leaves visible symptoms on needles and leaves. Researchers at the Swiss Federal Institute for Forest, Snow and Landscape Research now reported on a glimmer of hope: Based on data from 233 research sites in 18 countries, mean summer ozone concentrations have decreased significantly. However, levels still exceed the threshold value above which adverse effects can occur.



<http://swissinnovation.org/news/web/2018/06-181218-f9>

## Using Smartphones Long Makes them more Environmentally Friendly

(higgs.ch, December 19, 2018)

Using a digital device like a smartphone for one day puts a strain on the environment just as if you were driving three kilometers by car or eating a hamburger that day. The problem is not the power that the devices consume but their production. At least if a smartphone, as usual among Swiss teenagers, only is in operation for two years. Researchers from the Zurich University of Applied Sciences came to this conclusion as part of the "Digital Sufficiency" project. The good news is that this eco-balance can be easily improved by simply using devices longer. If Swiss teens use their cell phone for three years instead of the average age of two years in their age group, the environmental impact of all mobile phone use would be reduced by a quarter.



<http://swissinnovation.org/news/web/2018/06-181219-6d>

## Photovoltaic Panels in high Mountains Reduces Power Deficit

(EPFL, January 07, 2019)

The amount of electricity generated by solar energy is subject to substantial seasonal fluctuations. As a general rule, in summertime photovoltaic (PV) systems generate more electricity than is needed by the market. However, in winter a supply shortfall arises because of reduced solar radiation. In order to overcome the disparity between supply and demand, electricity produced in the summer needs to be stored for available use in wintertime. This is currently feasible on a large scale only in pumped storage power stations, but available capacities are lacking. Furthermore, this solution entails high energy wastage. Now, researchers at WSL Institute for Snow and Avalanche Research SLF and EPFL have found installing photovoltaic panels in high mountains could significantly reduce the power deficit experienced by this renewable energy in winter.



<http://swissinnovation.org/news/web/2019/06-190107-f0>



## Studying Melting Glaciers

(EPFL, January 15, 2019)

Four EPFL researchers will explore New Zealand's glacier-fed streams for two months. By collecting microorganisms from hundreds of glacier-fed streams and analyzing their genomes, the scientists hope to understand, before it disappears, how this microbial life has adapted to the extreme conditions it is exposed to and how it is changing as the world's mountain glaciers melt. After several months of training in Switzerland, the field team is ready to departure. They will be staying in New Zealand for two months, exploring glaciers of several areas (Arthur's Pass, West Coast, Mount Cook Village, Haast Pass, Wanaka and Milford Sound) and working with local scientists and alpinists. Until 2021, the team will visit 15 countries and sample about 200 glacier-fed streams around the world.



<http://swissinnovation.org/news/web/2019/06-190115-b7>

## First High-Resolution Simulation of Earthquake Rupture Zone

(ETH Zurich, January 16, 2019)

In April 2015, Nepal – and especially the region around the capital city, Kathmandu – was struck by a powerful tremor. An earthquake with a magnitude of 7.8 destroyed entire villages, traffic routes and cultural monuments, with a death toll of some 9,000. However, the country may still face the threat of much stronger earthquakes with a magnitude of 8 or more. This is the conclusion reached by a group of earth scientists from ETH Zurich based on a new model of the collision zone between the Indian and Eurasian Plates in the vicinity of the Himalayas. Using this model, the ETH researchers have now performed the first high-resolution simulations of earthquake cycles in a cross-section of the rupture zone.



<http://swissinnovation.org/news/web/2019/06-190116-77>

## CO2 Reservoirs in Fractured Rock

(ETH Zurich, January 17, 2019)

In order to achieve ambitious international climate objectives, it will be necessary to remove CO<sub>2</sub> from the atmosphere and store it. A project in the Jura mountains is now testing how rock fractures impair long-term reservoirs. The physical and chemical processes that affect whether and how CO<sub>2</sub> can escape through fault zones are still poorly understood, it is unclear what influence CO<sub>2</sub> injections have on rock deformations and chemical interactions that can trigger earthquakes, as well as about the prevailing conditions in Switzerland, making it hard to assess whether underground CO<sub>2</sub> storage is even an option. For this reason, scientists from ETH Zurich, the Swiss Competence Center for Energy Research – Supply of Electricity, Swisstopo and EPFL are investigating how well fractured rock can store CO<sub>2</sub>, the conditions under which induced seismicity occurs, and how best to monitor a reservoir of this kind.



<http://swissinnovation.org/news/web/2019/06-190117-7d>



## 7. Engineering / Robotics / Space

### Drones on Irchel Campus

(University of Zurich, December 04, 2018)

Starting in December 2018, drones are transporting laboratory samples between University Hospital Zurich and the University of Zurich lab on Irchel Campus – an approach that is time-saving as well as technologically and ecologically innovative. These fully autonomous flying vehicles will be making about five unmanned journeys every day. There the blood and saliva samples can be analyzed as quickly as possible.



The University of Zurich's new drone delivery system is part of an innovative project by Swiss Post designed to develop the commercial use of drone transport in Switzerland. The project was approved by the Federal Office of Civil Aviation for one year and will be evaluated regularly by all participants.

<http://swissinnovation.org/news/web/2018/07-181204-f3>

### New Foldable Drone Flies through Narrow Holes

(University of Zurich, December 12, 2018)

Inspecting a damaged building after an earthquake or during a fire is exactly the kind of job that human rescuers would like drones to do for them. A flying robot could look for people trapped inside and guide the rescue team towards them. But the drone would often have to enter the building through a crack in a wall, a partially open window, or through bars – something the typical size of a drone does not allow. To solve this problem, researchers from University of Zurich and EPFL created a new kind of drone. Inspired by birds that fold their wings in mid-air to cross narrow passages, the new drone can squeeze itself to pass through gaps and then go back to its previous shape, all the while continuing to fly. And it can even hold and transport objects along the way.



<http://swissinnovation.org/news/web/2018/07-181212-6d>

### Satellite Data Expose Looting

(University of Bern, December 17, 2018)

It has become increasingly difficult to find unlooted tombs. The prices for archaeological objects from these burials, however, have seen a vast increase. Gino Caspari from University of Bern analyzed the condition of burials in a difficult-to-access region based on high-resolution satellite imagery. These data help to assess the degree of destruction inflicted upon the archaeological heritage. Through conducting an on-ground survey, the researchers managed to show that high-resolution satellite imagery can provide an accurate measurement of the destruction at a particular site. Using time series of different datasets, looting can be effectively monitored. Caspari analyzed data going back to 2003 and found out that since then the number of looted tombs increased substantially.

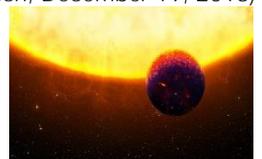


<http://swissinnovation.org/news/web/2018/07-181217-6e>

### New Kind of Super-Earths

(University of Zurich, December 19, 2018)

During their formation, stars were surrounded by a disc of gas and dust in which planets were born. Rocky planets were formed out of the solid bodies left over when the proto-planetary gas disc dispersed. These building blocks condensed out of the nebula gas as the disc cooled. The resulting planets have an Earth-like composition with an iron core. Most of the super-Earths known so far have been formed in such regions.



Researchers from the Universities of Zurich and Cambridge calculated what a planet being formed in hot regions closer to the star would look like. They found that calcium, aluminum, magnesium and silicon are the main constituents and that there is hardly any iron. Therefore, such planets cannot have a magnetic field and



since the inner structure is different, their cooling behavior and atmospheres will also differ from those of normal super-Earths.

<http://swissinnovation.org/news/web/2018/07-181219-28>

## High Tech Robot Goes Underground

(ETH Zurich, December 19, 2018)

ANYmal, a robot developed at ETH Zurich together with ANYbotics, an ETH Zurich spin-off, can see and hear, and even open doors. An international research team is now working to ensure the robot can function in extreme conditions – a mission that takes them to the labyrinth of drains and tunnels below Zurich. ANYmal could one day be deployed in sewerage systems. It might be used, for instance, to help the City of Zurich employees who regularly have to walk or crawl through the some 100 kilometers of accessible shafts and drains underneath the city and whose job it is to check the walls and floors for damage. This work not only poses a health risk, but is also potentially lethal, given that the drains can fill up with water very quickly without warning.



<http://swissinnovation.org/news/web/2018/07-181219-a4>

## Measurement of Gamma-Ray Bursts in Space

(Paul Scherrer Institute, January 14, 2019)

The detector POLAR, which was developed at the Paul Scherrer Institute in collaboration with researchers from the University of Geneva and scientists in China and Poland, has been sent to outer space to collect data. In 2016, the device was launched into Earth orbit on board the newest Chinese space station. POLAR then recorded so-called gamma-ray bursts. Gamma-ray bursts are eruptions of extremely high-energy light that to a large extent are not well understood. Their origin, among other things, remains unclear. To better understand them, POLAR measured a particular property of their light: the so-called polarization. The researchers evaluated five of the several dozen bursts recorded. Analysis revealed now that the light of the gamma-ray bursts has a low degree of polarization. Thus, theories about gamma-ray bursts that assume a high degree of polarization can now be regarded less likely correct.



<http://swissinnovation.org/news/web/2019/07-190114-74>

## Robot Recreates Walk of 300-Million-Year-Old Animal

(EPFL, January 16, 2019)

To better understand how Orobates walked and pinpoint just how advanced its locomotion was, scientists at Humboldt-Universität zu Berlin developed a digital model of its skeleton based on the animal's fossil and the biomechanics of modern animals with sprawling postures. In parallel, scientists at EPFL used the fossilized animal anatomy to build a robot called OroBOT. Designed and scaled to match the shape and movements of the extinct animal, OroBOT was used to calculate the physics of how Orobates walked. The interdisciplinary team tested hundreds of different gaits with their robot in order to determine which ones Orobates could have used – and those that it clearly did not. Orobates probably already held itself a little upright on its legs – unlike salamanders and skinks. Its locomotion was thus more advanced than had been previously thought.



<http://swissinnovation.org/news/web/2019/07-190116-79>



## Smart Microrobots Adapt to Surroundings

(EPFL, January 18, 2019)

Scientists at EPFL and ETH Zurich have developed tiny elastic robots that can change shape depending on their surroundings. They drew inspiration from bacteria to design smart, biocompatible microrobots that are highly flexible. Because these devices are able to swim through fluids and modify their shape when needed, they can pass through narrow blood vessels and intricate systems without compromising on speed or maneuverability. They are made of hydrogel nanocomposites that contain magnetic nanoparticles allowing them to be controlled via an electromagnetic field. Fabricating miniaturized robots presents a host of challenges, which the scientists addressed using an origami-based folding method. Their novel locomotion strategy employs embodied intelligence, which is an alternative to the classical computation paradigm that is performed by embedded electronic systems.



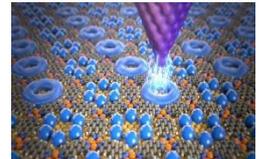
<http://swissinnovation.org/news/web/2019/07-190118-9e>

## 8. Physics / Chemistry / Maths

### Storage Device on the Atomic Scale

(University of Basel, December 17, 2018)

Around the world, researchers are attempting to shrink data storage devices to achieve as large a storage capacity in as small a space as possible. Researchers from the University of Basel have reported a new method that allows the physical state of just a few atoms or molecules within a network to be controlled. It is based on the spontaneous self-organization of molecules into extensive networks with pores about one nanometer in size. In the journal *Small*, the physicists reported on their investigations, which could be of particular importance for the development of new storage devices.



<http://swissinnovation.org/news/web/2018/08-181217-85>

## 9. Architecture / Design

### EPFL Is Part of Europe's Largest Research Initiative on Urban Mobility

(EPFL, December 05, 2018)

The MOBILus consortium has won the call for proposals issued by the European Institute of Innovation and Technology (EIT) to create a Knowledge and Innovation Community (KIC) in the field of "Urban Mobility." MOBILus – which will be known as EIT Urban Mobility as of 1 January 2019 – brings together 48 partner organizations including EPFL to design, build and implement novel systems for making city transportation more sustainable. Its total research budget is €1.6 billion over seven years (2019–2026); this EU funding will provide €400 million of that, helping make it one of the largest publicly funded initiatives for urban transportation in the world. The consortium will set out to address eight challenges: sustainable urban growth; transportation network decongestion; interdisciplinary talent; eco-efficient and safe urban transport; data exploitation; mobility industry competition; regulatory and behavioral change; and urban governance.



<http://swissinnovation.org/news/web/2018/09-181205-18>



## Between Art and Science: Showcasing Pictures of Macroalgae

(University of Zurich, January 21, 2019)

Around 2.5 billion years ago, blue-green algae, also known as cyanobacteria, started producing and releasing oxygen into the atmosphere. Without this evolutionary milestone life as we know it would not be possible: One in two oxygen atoms we inhale come from the photosynthesis of algae. Unlike microalgae, which can only be seen under a microscope, macroalgae are generally visible to the naked eye. They are classified into groups according to their color, with some species growing to a length of up to 40 meters. All land plants originally evolved from a group of green algae and are therefore, at least in the broadest sense, related to them. From 25 January, photographer and illustrator Josh Westrich is showcasing his pictures of macroalgae in the greenhouses of the University of Zurich's Botanical Garden. For his work, he visited various collections of preserved plant specimens.



<http://swissinnovation.org/news/web/2019/09-190121-e8>

## 10. Economy, Social Sciences & Humanities

### Expulsion Policies of Foreigners

(University of Neuchâtel, December 06, 2018)

Researchers at the University of Neuchâtel studied the expulsion policies of foreigners in delinquency with the law in France, Switzerland and Turkey. Their study showed that, despite the notable differences between the three countries studied, removals of foreigners constitute of main tools, which are considered indispensable but are often doomed to failure. The researchers note that the idea of expulsion usually comes up very early. In Switzerland, for example, in federal registration and procedure centers, people are informed of the existence of a financial bonus to encourage them to return to their country of origin, even before filing out their application for asylum registration. In France, under the presidency of Nicolas Sarkozy, eviction quotas were announced each year. Various administrative services, as well as labor inspectors and officials dealing with the care of the unemployed, have been encouraged to contribute to these objectives.



<http://swissinnovation.org/news/web/2018/10-181206-59>

### Reserved Driving Time to Reduce Traffic Congestion

(EPFL, December 10, 2018)

We've all sat frustrated in rush-hour traffic – either in the morning on the way to work, in the evening on the way home, or both. Some try to get around the problem by leaving a little earlier or a little later. That helps balance out traffic flows and create a certain equilibrium – which many transportation engineers and economists have been studying. Their goal is to better understand the mechanisms behind this equilibrium so that large infrastructure projects can be better designed and help reduce congestion. Researchers at EPFL investigated this equilibrium and weigh up different methods for reducing traffic congestion. They showed that most city traffic follows a first-in, first-out (FIFO) approach, but that a more efficient way to regulate traffic would be by introducing a reservation system for specific time slots.



<http://swissinnovation.org/news/web/2018/10-181210-09>



## Effects of Bonus Systems on Employee Motivation

(University of St.Gallen, December 12, 2018)

Pay for performance is a variable remuneration based on the achievement of individual goals and is currently a widely used practice. Previous research has already shown that in the case of complex tasks, pay based on individual goal achievement has a negative impact on the intrinsic motivation of employees. "In a corporate context, scientific evidence is scarce though," adds Dalla-Rosa and he wanted to fill this gap. "As expected, the study revealed that these bonus systems improved the extrinsic motivation of employees," says Dalla-Rosa. "However, the results also showed that intrinsic motivation was suppressed by pay for performance." The suppression increased the more experience the employee had. Dalla-Rosa also stresses that pay for performance is not per se "bad". "For simple, repetitive tasks it can serve its purpose."



<http://swissinnovation.org/news/web/2018/10-181212-2c>

## One Fourth of all Swiss People have Dual Citizenship

(University of Luzern, December 19, 2018)

With the increase of Swiss dual citizens, the simplified categories "Swiss" and "foreigners" are blurring. Among Swiss, dual citizenship is particularly widespread: Every fourth Swiss citizen has at least one more citizenship. Researchers from the University of Lucerne, from the Liechtenstein Institute and the DemoScope have written a comprehensive study on dual citizenship for the Federal Commission on Migration. The study analyzes the causes of the rapid increase in the number of dual citizens. In addition, the chances and risks of dual citizenship are discussed from the perspective of the dual citizens, but also from the perspectives of the affected countries and societies. Particular attention is paid to the question of how dual citizenship can be assessed from a democratic point of view.



<http://swissinnovation.org/news/web/2018/10-181219-b7>

## Interpreting Emotions

(University of Geneva, December 21, 2018)

We are constantly exposed to the facial expressions of the people around us, expressions that reflect their emotions. But do we interpret them correctly? And do we trust our own judgment? This trust is essential for avoiding misunderstandings or even potentially dangerous situations. That is the reason why researchers from the University of Geneva and University Hospitals of Geneva have been testing how confident we feel when judging other people's emotions, and what areas of the brain are used. These results demonstrate that beliefs of our own emotional interpretation stem directly from the experiences stored in our memory. In other words, our past life influences our interpretations and sometimes leads us astray.



<http://swissinnovation.org/news/web/2018/10-181221-e0>

## Value of Friendships in Academic Success

(ETH Zurich, January 10, 2019)

ETH Zurich sociologists have demonstrated through a new dynamic network analysis method how relationships among bachelor's students develop and turn into a network during the first academic year. In so doing, they noticed that those students who passed their exams at the end of their first year on a bachelor's degree program had a much stronger network with their peers than those who failed their exams. "The extent to which a student's network and degree of integration influenced their individual results did surprise me", says Christoph Stadtfeld, "some students don't fail because of their individual abilities but because they fall through the network." What sets their method apart is that it enables them to determine the influence of social networks on individual academic





success, while other studies of educational achievement tend to connect performance and academic success primarily with individual variables.

<http://swissinnovation.org/news/web/2019/10-190110-0e>

## Limit Alcohol Consumption with App

(higgs.ch, January 14, 2019)

Many people use their smartphone to moderate their consumption of alcohol. Special apps like "I Am Sober" promise that users will gradually drink less alcohol, or even stop drinking at all. "Such apps replace a therapy for an alcohol addiction by no means," says Nicolas Bertholet, doctor and expert for addiction at the University of Lausanne. "But to help healthy people to drink less, they can be quite useful." In a clinical trial, the addiction expert has tested an app, which was specially developed to control alcohol consumption. Half of the subjects used the app, the other half, the control group, did not know about it at all. After six months, all the participants provided again information about their alcohol consumption. It turned out that the app users drank 12% less alcohol than the control group.



<http://swissinnovation.org/news/web/2019/10-190114-7d>

## Nudging Does Not Necessarily Improve Decisions

(University of Zurich, January 16, 2019)

Nudging is a well-known and popular concept in behavioral economics. It refers to non-coercive interventions that influence the choices people make by changing the way a situation is presented. Whether a nudge ultimately results in a person making decisions that are better suited to their needs is an important factor in assessing the effectiveness of nudges. This is the starting point of the research work of a group at the University of Zurich. "We can't determine whether a nudge improves the choices a person makes until we understand how they reach their decisions," says Nick Netzer, putting the hype surrounding nudging into perspective. "Depending on which behavioral model we take as a starting point, it is possible to measure the effectiveness of nudges – or not."



<http://swissinnovation.org/news/web/2019/10-190116-6a>

## Feminization of Men Leads to Rise in Homophobia

(University of Geneva, January 22, 2019)

Before the feminist revolution in the late 1960s, men largely built their masculinity on traits that opposed those assigned to women. Since then, society has been moving more and more towards gender equality, and men can no longer rely on this anti-feminine norm. What are the effects of this shift on masculinity affirmation? Researchers at the University of Geneva have revealed that some men assert their manhood by stressing their heterosexuality, in order to compensate for this feminization of men. This move marks a clear rejection of homosexuality, seen as the personification of the feminine man. The results reflect the difficulties Western societies have in granting homosexuals the same rights as heterosexuals, with some men leaning on homophobia to help them find their place in an increasingly egalitarian society.



<http://swissinnovation.org/news/web/2019/10-190122-d2>



## Inequality Promotes Deforestation in Latin America

(University of Bern, January 24, 2019)

Tropical deforestation is a major contributor to climate change and loss of local and global ecosystem functions. Latin America accounts for a large share of remaining tropical forests, but also features deforestation rates well above the world average. The biggest driver of deforestation is expansion of agricultural frontiers to meet the demands of international markets. Power imbalances and economic inequality have long been assumed to play a role in the processes causing loss of tropical forests. Yet the effects of inequality on the environment remain a subject of scientific debate. A new study carried out at the University of Bern, takes a first-ever look at the specific links between different forms of inequality, increasing agricultural productivity, and farmland expansion at the expense of forests in Latin America. The study shows that greater inequality increases deforestation, and less inequality better protects forests in the long-term.



<http://swissinnovation.org/news/web/2019/10-190124-90>

## Measuring Impact of Key Corporate Governance Issues

(University of Lausanne, January 31, 2019)

Corporate governance rules are designed to ensure that firms are well run – that management decisions do not unjustly deprive certain stakeholder groups of value, for example. A major challenge for policymakers, however, as regular reports of poorly run companies in the media show, is devising effective governance provisions. Now though, using a novel approach, researchers at University of Lausanne and EPFL have devised and made available a new corporate governance index, which can be used to score firms on how responsibly they behave. While for policymakers the index can be used to gauge the efficacy of particular governance provisions. This is something the researchers actually demonstrate by showing the before and after impact of measures designed to help minority shareholder voice their concerns better.



<http://swissinnovation.org/news/web/2019/10-190131-a5>

## 11. Startups / Technology Transfer / IPR / Patents

### Third of Patents Produced by ETH Domain Are World Class

(swissinfo.ch, December 10, 2018)

An analysis of world-class patents developed by research institutions puts Switzerland in third place globally. 671 Swiss patents in 17 technological fields were analyzed for the comparison, which was commissioned by the ETH Domain and carried out by BAK Economics. The results revealed that a third of the patents produced by the ETH Domain were world class. A 'world class' patent is one that is in the top 10% of internationally ranked patents in its field. Two main criteria for ranking the patents internationally were their technological impact (the number of citations of the patents by third parties) and their market coverage (the number of countries in which the patents were filed). Swiss patent quality was especially strong in the areas of drones, security technology and photovoltaic energy. Only American institutions Harvard and the Massachusetts Institute of Technology (MIT) did better than the ETH Domain overall.



<http://swissinnovation.org/news/web/2018/11-181210-89>

## Europe's Most Promising Digital Health Startup

(startupticker.ch, December 10, 2018)

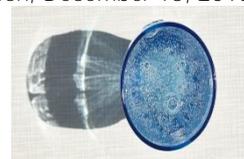
The European Health Catapult Competition (EHC) is a training and competition platform that awards the most outstanding business concepts from medtech, biotech and digital health across Europe. EHC sources and accelerates European start-ups in biotech, medtech and digital health providing them training in business plan modelling, deal negotiation and pitch training, as well as facilitated access to top-level investors. During the EIT health Summit, the jury announced and awarded three startups in three categories. Sleepiz from Zurich won the category prize digital health receiving a cash prize and in-kind recognition from the EIT Health community that can lead to further support and investment. Sleepiz developed a revolutionary sleep disorder-screening device. By using wireless technology, the device can measure vital human signs at medical accuracy without touching the patient - enabling non-contact clinical grade home diagnosis of sleep apnea.  
<http://swissinnovation.org/news/web/2018/11-181210-13>



## Mineral Water Carbonation with CO2 from Climeworks' Air

(startupticker.ch, December 13, 2018)

VALSER, part of Coca-Cola, is the first company to use Climeworks' new technology to extract CO2 from the air and process it for use in beverages. Climeworks delivers clean, air-filtered CO2 to its customers, while giving them the ability to reverse their emissions. This collaboration will enable Coca-Cola HBC Switzerland to source the carbon dioxide needed for carbonated beverages from a sustainable source. At the same time, Coca-Cola is helping HBC Switzerland recycle CO2 from the air and, above all, is providing a market for further development of technology that is of great importance for achieving the United Nations set climate goals. Climeworks' co-founder and CEO Jan Wurzbacher says: "[...] We are excited about the opportunity to work with a leader in the beverage industry as part of our overarching goal of removing one percent of global CO2 emissions by 2025. "



<http://swissinnovation.org/news/web/2018/11-181213-6a>

## Startup to Diminish Food Waste

(startupticker.ch, December 18, 2018)

Food and Agriculture Organization of the United Nations estimated annual food waste at an equivalent of USD 1'000 billion, out of which USD 60 billion of fruits and vegetables lost due to fungal pathogens in post-harvest. Metabolites of some of the broadly spread molds in food storage facilities can have an additional adverse effect on humans. To this day, no efficient, cost-effective, organic treatments against molds are available on the market. AgroSustain develops a pipeline of plant-inspired antifungal solutions to identify and bring to market organic treatments against a broad range of fungal pathogens present in food storage facilities. The startup's core product is AgroShelf+, which is designed to prevent the development of fungal pathogens and reduces food waste. The startup recently announced the closing of its first financing round of CHF 1.1 million with National and international private investors as well as family offices.



<http://swissinnovation.org/news/web/2018/11-181218-b8>

## Startup Cellestia Biotech AG Secures CHF 20 Million in Series A funding

(Cellestia, December 19, 2018)

Cellestia Biotech AG announced the closing of a CHF 20 million Series A financing round. The new funds will be added to the previous CHF 8 million SEED financing and CHF 1 million non-dilutive research grants, bringing the total capital raised to CHF 29 million (USD 29 million). Upon closing of the Series A financing, FC Capital and PPF/Sotio will become major shareholders of Cellestia Biotech AG. FC Capital is a China-based private equity firm specializing in healthcare investments in the Greater China region, the US and the European



countries. PPF Group invests into multiple market segments such as banking, financial services, telecommunications, insurance, real estate, agriculture and biotechnology. Cellestia was founded in 2014 as a spin-off from EPFL. The lead development compound of Cellestia is CB-103, a novel, first-in-class oral pan-NOTCH inhibitor indicated for treatment of patients with NOTCH-dependent leukemias, lymphomas and solid tumors.

<http://swissinnovation.org/news/web/2018/11-181219-f7>

## Swisscom Ventures and ZKB Invest in Scailyte

(startupticker.ch, December 19, 2018)

Scailyte develops artificial intelligence (AI) based software for best-in-class analysis of complex single-cell data to enhance biomedical research, pharmaceutical discovery and precision diagnostics. The software for biomedical research, commercialized under the brand ScaiVision, will be launched at the beginning of 2019. Scailyte also offers biomarker discovery services to companies aiming to complement and enrich their analysis by adding the single-cell perspective. Following the closing of its financing round, Scailyte has won Swisscom Ventures as a strategic investor following the. Zürcher Kantonalbank (ZKB) also joined the round, alongside the existing shareholders, thus reaffirming their trust in the competence and vision of Scailyte's team. The raised capital will be used to enhance the market entry and to speed up further development of ScaiVision, allowing it to be more accessible and attractive to a wider range of customers.



<http://swissinnovation.org/news/web/2018/11-181219-1d>

## Showcasing Switzerland as Leading Center of Technology and Innovation

(admin.ch, December 20, 2018)

Switzerland made its first-ever appearance at the world's largest expo for home electronics, the Consumer Electronics Show (CES) in Las Vegas from 8 to 11 January 2019. Presence Switzerland used this opportunity, in collaboration with Switzerland Global Enterprise and with support from the institutional partners Innosuisse, digitalswitzerland and the swissnex network in the US, to create a pavilion that showcases the country as a leading center of technology and innovation. Switzerland's participation at the event in Las Vegas is one of a range of Presence Switzerland campaign activities to position the country as a leading center of innovation and technology – making it an attractive location for global investors and foreign companies. The Swiss pavilion will showcase products and innovations from over 30 companies – mainly startups – working in fintech, life science, IT, drone technology and gaming.

<http://swissinnovation.org/news/web/2018/11-181220-9e>

## EPFL Startups Raise Total of 217 Million in 2018

(EPFL, December 21, 2018)

EPFL startups raised a total of CHF 217 million in 2018 – not far from the record of CHF 260 million set in 2016. These figures are up sharply from just eight years ago, when EPFL startups raised some CHF 50 million. “This rapid growth testifies to the entrepreneurial spirit that is very much alive on our campus, as well as the ambition and drive of EPFL-bred entrepreneurs,” says Hervé Le Bret, Head of EPFL's Start-ups Unit.



Today, technology developed at EPFL labs is being readily transferred to industry and eventually on to consumers. The upshot is a growing number of successful EPFL spin-offs. Much of this is due to the various forms of assistance available to fledgling businesses at EPFL, through initiatives first rolled out some 25 years ago.

<http://swissinnovation.org/news/web/2018/11-181221-b9>



## Innosuisse Takes Over Multinational Joint Innovation Program

(admin.ch, January 03, 2019)

Since 1 January 2019 Innosuisse, the Swiss Agency for the Promotion of Innovation, has been responsible for innovation-oriented European partnership programs with the EU and for the market-driven EUREKA research and development initiative. Innosuisse took over these tasks from the State Secretariat for Education, Research and Innovation (ERI) with the aim of better exploiting synergies in project funding, entrepreneurship and knowledge and technology transfers. The following multinational cooperation programs changed from ERI's to Innosuisse's jurisdiction on 1 January 2019: the European partnership programs with the EU (Eurostars 2, Active and Assisted Living (AAL), Electronic Components and Systems for European Leadership (ECSEL)) and the cross-border EUREKA research and development initiative. Moreover, the European Research Area (ERA)-Nets scheme is now within Innosuisse's purview. The programs' funding conditions remain unchanged.

<http://swissinnovation.org/news/web/2019/11-190103-0d>

## New Record of ETH Zurich Founded Spin-Offs

(ETH Zurich, January 04, 2019)

In 2018, ETH Zurich achieved a new record high for the number of spin-offs founded: a total of 27 founding teams took the plunge into independence. While an average of 13 ETH spin-offs were founded per year from 2000 to 2010, the following decade has seen an average of 24 per year. For Detlef Günther, Vice President of Research and Corporate Relations, the successive increase in the number of new companies over the past two decades is the best evidence that internal university support programs pay off: "I am delighted that so many talented young people are displaying the perseverance and courage required to develop their ideas to market maturity, as this ultimately also benefits the Swiss economy and society," he says.



<http://swissinnovation.org/news/web/2019/11-190104-cb>

## 12. General Interest

### Most Successful Researchers Receiving Grants from ERC Based in Switzerland

(European Research Council, December 07, 2018)

The European Research Council (ERC) announced the results of the call for Consolidator Grants 2018. Worth a total of about 573 million euros, these grants are available for funding research projects run by research scientists who have gained between 7 and 12 years of experience since the completion of a PhD. There is a maximum of 2 million euros available per grant over a period of five years. Switzerland is in 4th position among the beneficiary countries, hosting 29 projects (10%). Considering the ratio of starting grants relative to population size, the most successful researchers are based in Switzerland. Eight Swiss institutions benefit from the 2018 Consolidator program: ETH Zurich (10 grants), University of Zurich (5), EPFL (4), University of Bern (4), University of Basel (2), University of Geneva (2), University of Applied Sciences and Arts of Southern Switzerland (SUPSI) (1) and University of Fribourg (1).

<http://swissinnovation.org/news/web/2018/12-181207-fb>

### swissnexDay'18: Blockchain Technology in Switzerland and Worldwide

(admin.ch, December 11, 2018)

Held in December in Zurich, swissnexDay served as a forum for a wide range of actors to discuss blockchain. The event entitled Connecting the blocks, unchaining the blockchain provided a global perspective to define the challenges and opportunities of a technology for which Switzerland is one of the main centers of excellence.



The event, which was organized by the State Secretariat for Education, Research and Innovation and swissnex China, was attended by around 400 representatives from the field of education, research and innovation. The event was organized in partnership with the University of Zurich (UZH), which has a center dedicated to this technology – the UZH Blockchain Center – ETHZ and the Crypto Valley Association, based in Zug.

<http://swissinnovation.org/news/web/2018/12-181211-c6>

### Federal Council Appoints Gian-Luca Bona to ETH Board and Thierry Strässle as PSI Director

(admin.ch, December 14, 2018)

The Federal Council appointed Prof. Gian-Luca Bona, Director of Empa, to the ETH Board. The Swiss Federal Institutes of Technology Act states that the four research institutes, the PSI, WSL, Empa and Eawag, must be represented on the ETH Board. This position will now be assumed by Prof. Bona, as PSI director Prof. Joël Mesot, who has represented the research institutes until now, was appointed president of ETH Zurich in October, and steps down as PSI director at the end of this year. A successor is now being sought for this post; Dr Thierry Strässle will assume the directorship ad interim from January 2019. Gian-Luca Bona has been Director of Empa (the Swiss Federal Laboratories for Materials Science and Technology) and Professor of Photonics at ETH Zurich and EPFL since September 2009.

<http://swissinnovation.org/news/web/2018/12-181214-51>

## 13. Calls for Grants/Awards

### Call: Projects Based on Technological Innovation with Societal or Economic Impact

(bridge.ch, December 20, 2018)

The Swiss National Science Foundation SNSF and the Commission for Technology and Innovation CTI are continuously monitoring developments in the area of research and innovation in Switzerland. They have noticed that certain interesting projects risk falling in the gap between SNSF and CTI funding schemes. The Federal Council has mandated the two organizations to address this problem by setting up the special program BRIDGE. BRIDGE Discovery is aimed at experienced researchers for basic as well as applied research in order to realize the innovation potential of research findings. The Discovery funding opportunity is open to researchers submitting project based on a technological innovation with a strong societal or economic impact. A letter of intent has to be handed in on February 18, the full proposal on April 8 and the interview for the third call will take place on November 18/19, 2019.



<http://swissinnovation.org/news/web/2018/13-181220-35>

### Call: Exploring Information Flow Along New Silk Road

(China Media Observatory, January 02, 2019)

The “New Silk Road”, or in the Chinese official discourse, the “Belt & Road initiative — 帶一路” was launched in 2013 to reconnect China with countries in Asia, Middle East, Europe and Africa and to establish different levels of cooperation with new partners. Discussions about the New Silk Road and its relationship with all related regions had been mainly conducted in political and economic studies. Much less attention has been paid from the media and communication perspectives. Therefore, the China Media Observatory is looking for papers which analyze the ramifications of the “Belt and Road Initiative” in the context of transnational and cross-cultural communication. Papers must be handed in by March 31, 2019.



<http://swissinnovation.org/news/web/2019/13-190102-12>

## Call: Support Program for Universities of Applied Sciences Graduates

(Gebert Rüt Stiftung, January 03, 2019)

Under its «BREF – Brückenschläge mit Erfolg» area of activity, Gebert Rüt Stiftung has been promoting selected research and development projects as exemplary drivers of Switzerland's universities of applied sciences since 1997. In cooperation with «swissuniversities», annual call for papers are issued for this purpose. The focus is on creating a bridge between science, business and society. It is at this interface that universities of applied sciences can develop innovative solutions. Under the banner of «First Ventures» Gebert Rüt Stiftung promotes bachelor's and master's students of universities of applied sciences who are developing an innovative business idea as their thesis topic. The support includes a financial contribution as well as an individually tailored coaching program which will smooth the way to launching a start-up. For this focus program funds of CHF 1.5 million p.a. will be made available. The next submission deadline is May 5, 2019.

<http://swissinnovation.org/news/web/2019/13-190103-54>

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## Call: Young Scientists Mobility Grants with MENA Countries

(University of Applied Sciences Western Switzerland, January 03, 2019)

The State Secretariat for Education, Research and Innovation (SERI) has commissioned the HES-SO as Leading House for the Middle East and North Africa (MENA) region. The following countries have been identified as priority countries for the first phase: Egypt, Lebanon, Morocco, Palestine, Qatar, Tunisia and the United Arab Emirates. The mobility grants can be awarded to young scientists who hold a bachelor's or master's degree but no PhD yet, and with not more than 6 years of professional research experience. The call is open for activities in all scientific disciplines and fields of research. Activities may include field work and/or an internship in relation to the applicant's research project. The applicant's mobility visit should have a minimum duration of 4 weeks and the amount not more than CHF 5,000 per grant. Applications will be accepted until December 31, 2019.

<http://swissinnovation.org/news/web/2019/13-190103-8c>

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Haute Ecole Spécialisée  
de Suisse occidentale  
Fachhochschule Westschweiz  
University of Applied Sciences and Arts  
Western Switzerland

## Call: Young Talents in Clinical Research

(Swiss Academy of Medical Sciences, January 03, 2019)

Medical doctors engaged in clinical research are faced with many challenges, including the lack of time, particularly during medical training, and the scarcity of funding for research projects. There is currently no system-inherent support in Switzerland for young doctors starting out in clinical research. With the «Young Talents in Clinical Research» program, the SAMS and the Gottfried and Julia Bangerter-Rhyner Foundation therefore contribute to improving the quality of clinical research in Switzerland. Medical doctors working in Switzerland, having obtained their medical degree no more than five years before the submission deadline can apply for a beginner grant. In a subsequent step, grantees can submit a proposal for a project grant provided that they have obtained their medical degree no more than 8 years before the submission deadline. The launch of next call will be in March 2019 with the next submission deadline being June 30, 2019.

<http://swissinnovation.org/news/web/2019/13-190103-23>

**SAMWASSM**

## Call: SIB Bioinformatics Awards

(Swiss Institute of Bioinformatics, January 10, 2019)

The SIB Bioinformatics Awards honor excellence in three categories: First, the SIB Early Career Bioinformatician Award is an international award that recognizes the excellence and promise of a researcher's early career, based on one or several projects and/or papers focusing on the in-silico analysis of biological sequences, structures or

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Swiss Institute of  
Bioinformatics

processes. The closing date for entries is March 31, 2019. Second, the SIB Best Swiss Bioinformatics Graduate Paper Award is a national award that recognizes outstanding papers published by a graduate student in the area of in silico analysis of biological sequences, structures or processes. The closing date for entries is March 31, 2019. Third, the SIB Bioinformatics Resource Innovation Award is an international award that recognizes newly developed bioinformatics resources with an important impact on life science research or the clear potential to make such an impact. The closing date for entries is April 30, 2019.

<http://swissinnovation.org/news/web/2019/13-190110-a1>

## Call: Swiss Startup Pavilion @ CES Asia 2019

(swissnex China, January 15, 2019)

swissnex China, in collaboration with Venturelab and Presence Switzerland, is organizing a Swiss Startup Pavilion at CES Asia 2019. Taking place from June 11-13 in Shanghai, CES Asia serves as the premier event for the consumer technology industry in China. If you are an innovative Swiss startup looking to take your business to the next level, seize this unique opportunity to showcase your service/product at the biggest electronics fair in Asia. The booth space will be entirely paid for by swissnex China, a pitch event will be organized, and you will be able to expand your network by leveraging swissnex China's local knowledge and network. Preferred Industries are artificial intelligence, audio/visual, robotics, AR/VR, lifestyle technology, HealthTech, IoT, and vehicle technology. The deadline for the application is March 12, 2019.



<http://swissinnovation.org/news/web/2019/13-190115-a9>

## Call: Korean-Swiss Science and Technology Program

(Swiss National Science Foundation, January 29, 2019)

In the context of the Korean-Swiss Science and Technology Program, the Swiss National Science Foundation (SNSF) and the National Research Foundation (NRF) of South Korea launch another call for Joint Research Projects (JRPs). Joint Research Projects (JRPs) enable researchers in Switzerland to conduct a joint project together with a Korean partner. The projects will have a duration of four years, with funding on the Swiss side amounting to a maximum of CHF 350,000 per project. The costs covered by the grants are comparable to those covered in national SNSF projects (equipment, research funds, salaries). Projects within the following thematic areas will be funded: Molecular physics, Digital health (this is an interdisciplinary topic; a project part in Social Sciences and Humanities is possible) and Advanced materials. The call for proposals is open until March 14, 2019.



<http://swissinnovation.org/news/web/2019/13-190129-cb>

## Upcoming Science and Technology Related Events

### Octopus's Garden

January 24-February 24, 2019

<https://is.gd/1Bn0eF>

Botany, Art-Science, Exhibition  
Zurich

### World IA Day

February 23, 2019

<https://www.worldiaday.org/>

Information Architecture, Design  
Zurich

### Frontières en tous genres

February 8-May 18, 2019

<https://is.gd/iDMIEC>

Exhibition, Geography, Borders  
Geneva

### Engineering Industry Day

March 20, 2019

<https://journeeindustrie.epfl.ch>

Innovation, Industry Exhibition  
Lausanne



### Aging & Cognition 2019

April 24-26, 2019

<http://eucas.org/ac2019/>

Cognitive Neuroscience, Healthy Aging  
Zurich

### Swiss Biotech Day

May 7, 2019

<http://swissbiotechday.ch/>

Finance, Production, Licensing  
Basel

### World Immune Regulation Meeting

April 6-9, 2019

<http://www.wirm.ch/>

Immune Activation, Autoimmunity  
Davos

### Conference of Science Journalists

July 1-5, 2019

<https://www.wcsj2019.eu/>

Good, Fair, Critical Reporting  
Lausanne

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