Summary

BioJapan 2010, the 12th edition of the longest-established international bioindustry event in Asia, was held in Yokohama from September 29 to October 1 with a focus on trends, practical application and commercialization of biotechnology. Switzerland was represented by the Swiss Biotech Pavilion, which hosted the Swiss Science Pole empowered by the Science & Technology Office Tokyo. The Pavilion further hosted the following co-exhibitors, such as Bachem AG, Biopôle, Cerbios-Pharma SA, Lonza AG, Regen Lab SA, Swiss Business Hub Japan Location Promotion, Swiss Biotech Association, BaselArea, Berne Capital Area, BioAlps, Biopolio Ticino, Greater Zurich Area, SIX Swiss Exchange AG, and CTI.

Based on the knowledge and relationships established by the Science & Technology Office Tokyo, which organized the Swiss presence at BioJapan from 2004 to 2008, the organization was handed over to OSEC in 2009. BioJapan 2011 will take place from October 5 to October 7, 2011.

BioJapan 2010

BioJapan 2010 World Business Forum (http://expo.nikkeibp.co.jp/biojapan/eng/index.html), one of the world’s largest international biotechnology exhibitions, was held for the twelfth time from September 29 to October 1, 2010 at Pacifico Yokohama, Japan.

The three-day event attracted more than 25'500 visitors, a 7% increase compared to the 2009 edition. This year main theme was “Renaissance of Bioindustry: Ride of right wave of open innovation” and the forum revolved around four sub themes: health, environment/low carbon, food (functional food, GMO) and clusters & bio-ventures. The visitors witnessed the latest trend in technologies deemed critical for solving global issues. These technologies are also considered to become the main driver for sustainable development of industries including pharmaceutical, food, chemical, machine and IT.

A total of 425 exhibitors (incl. co-exhibitors), consisting of a well balanced mixture of universities, overseas clusters, governmental bodies, private companies and small & medium-sized bio ventures, presented frontline research and cutting-edge new products. Overseas exhibitors accounted for almost half the number of exhibitors, as international collaboration is fast becoming a prerequisite for success in the field of biotechnology.

People visited the exhibition from academic and corporate research institutions, medical companies, bio ventures, investment offices and business development offices of national and local governments, engineering houses and venture capitals.

Qualified and well-known professionals were invited to speak about biotechnology trends and markets. The main keynote speeches included “Biomedical Innovation in the 21st Century” by Sir William Castel (Thhe Wellcome Trust), “Toward a New Generation of Renewable Fuels and Chemicals” by Todd Werpy (R&D Vice President Research at Archer Daniel Midland) and “S&T and Innovation Policy for Thriving in the Future” by Masuo Aizawa from the Cabinet Office, Government of Japan (Executive member of the Council for Science and Technology Policy).
The exhibition was co-organized by the Japan Bioindustry Association (JBA), Japan Health Sciences Foundation (JHFS), Society for Techno-innovation of Agriculture, Forestry and Fisheries (STAFF), Japan Biological Informatics Consortium (JIBIC), Japan Association of Biindustries Executives (JABEX), Japan Pharmaceutical Manufacturers Association (JPMMA), NPO Kinki Bio-industry Development Organization (KBDO) and Nikkei Business Publications, Inc.

Official sponsors were Merck & Co, Ltd. and F. Hoffmann-La Roche Ltd.


Why Japan?

The importance of Japan as one of the front runners in the bio industry has evolved substantially in recent years; a good example being the creation of “induced pluripotent stem cells” (iPS cells), which can renew themselves and can differentiate into a diverse range of specialized cell types. The country offers an excellent basis of academic research, cutting edge skills and technologies, all with strong forward momentum. Moreover, Japan’s biotechnology market, the world’s second biggest following the U.S., is estimated to reach 25 trillion yen in 2010.

On the policy side, the government has made clear its commitment in developing biotechnology as a national strategy for the welfare of its citizens as well as from the viewpoint of national competitiveness, national economy, security and bioethics. It recognizes the need for change (e.g. deregulation and promotion) and has strengthened initiatives to increase R&D funding and accelerate patent filings.

Swiss Biotech Pavilion

The Swiss Biotech Pavilion was situated in a dominant and central location, in an “island” configuration, located adjacent to the Roche Pavilion. The Swiss Biotech Pavilion had a high visual impact and was visible from both main streets. Once initiated by the Science & Technology Office Tokyo, the successful location has been continued after the hand-over of the organization to OSEC.

For the first time, the Swiss Biotech Pavilion accommodated the Swiss Science Pole.

Swiss Science Pole – Science & Technology Office Tokyo

The Science & Technology Office Tokyo showcased three life sciences’ research centers in Switzerland: the Biozentrum at the University of Basel, biotechnology and bioengineering at EPFL and the Institute of Molecular Systems Biology at ETH Zurich. All three were presented at BioJapan 2010 on the “Swiss Science Pole” of the Swiss Biotech Pavilion through posters and brochures. – In addition, a specific digest on latest news on Swiss life sciences & health care was distributed to the visitors of the booth (see appendix). – It was a good concept to enrich the Swiss Biotech Pavilion with the Swiss Science Pole, where academic highlights from the biotech research scene have been presented. The clear aim was to make Swiss institutions more known in Japan to foster further collaboration.
Swiss Biotech Pavilion Co-organizers

- OSEC / Swiss Business Hub Japan
  Embassy of Switzerland
  5-9-12 Minami Azabu, Minato-ku, Tokyo 106-8589
  www.eda.admin.ch/tokyo
  Contact in Japan: Mrs. Yumiko Kijima
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  Official Email: yumiko.kijima@eda.admin.ch

- Swiss Biotech Association
  Wengistrasse 7
  8004 Zürich, Switzerland
  www.swissbiotechassociation.ch
  Contact: Mr. Domenico Alexakis
  Telephone: +41 44 455 56 78
  Official Email: info@swissbiotechassociation.ch

Swiss Science Pole Organizer

- Science & Technology Office Tokyo
  Embassy of Switzerland
  5-9-12 Minami Azabu, Minato-ku, Tokyo 106-8589
  www.eda.admin.ch/tokyo
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  Telephone: +81 3 5449 8400
  Official Email: felix.moesner@eda.admin.ch

Exhibitors at Science Pole:
- Biozentrum, University of Basel
- Biotechnology and Bioengineering at EPFL

Swiss Participants and Sponsors

Corporate exhibitors:
- Bachem AG
- Biopôle SA
- Cerbios-Pharma SA
- Lonza Inc.
- REGEN LAB SA

Sponsors and non-corporate participants:
- Swiss Business Hub Japan
- Swiss Trade & Investment Promotion
- Basel Area Business Development
- Berne Capital Area
- BioAlps
- Biopolo Ticino
- Embassy of Switzerland in Japan
- Greater Zurich Area
- Science & Technology Office Tokyo
- Innovation Promotion Agency CTI
- SIX Swiss Exchange AG
- Swiss Biotech Association
- State Secretariat for Education and Research SER
APPENDIX:

Useful Websites and Floor Map

- BioJapan 2010 World Business Forum
  http://expo.nikkeibp.co.jp/biojapan/eng/index.html

- University of Basel – Life Sciences
  http://www.biozentrum.unibas.ch

- EPFL – Life Sciences
  http://sv.epfl.ch

- ETH Zurich – Institute of Molecular System Biology
  http://www.imsb.ethz.ch
Retinitis Pigmentosa Causing Gene

Researchers from the University of Lausanne and the University Hospital Center in Vaud have discovered a gene that protects us from narcolepsies, a disease that provokes handicapping drowsiness and a loss of muscular tonus. This major discovery will help scientists better understand sleep disorders. Prof. Mehdi Tafti and his team in collaboration with the University of Geneva had already proved the auto-immune character of narcolepsies.

Skin Tissue Produced From Thymus Cells

Scientists from ETH Zurich have managed to purify blood containing toxic agents in a few minutes using specially designed nano magnets. This promising process could, if put into practice, efficiently and rapidly help patients with intoxicating blood. Nano magnets are about 30 nanometers in diameter and weight less than 1 gram. Disease-causing substances in the blood bind with the nanomagnets. The nanomagnets are then removed using a permanent magnet.
**Drug Delivery Nanoparticles**

Protecting DNA and working for the cell are the two main goals of an adaptable protein whose various facets have been discovered by David Shore’s team at the University of Geneva. Apart from also protecting chromosome ends, this molecule modulates gene expression and influences the activity of other modulating genes. Since proteins are vital to life, scientists are interested in unveiling the mechanisms that control their production within cells. This focused interest led the researchers from Geneva to discover a surprising multi-tasking protein in yeast. Since yeast is a single-celled fungus which works like a mammal cell while being easier to manipulate, this discovery could lead to advances in gene control in human cells.

http://tinyurl.com/03-100603a

**New Method To Observe Brain Circuits**

The brain is a gigantic computer composed of billions of nerve cells which network to form sophisticated circuits. Researchers from the National Centre of Competence in Research (NCCR) Genomics at the Friedrich Miescher Institute in Basel have now developed a technique that can disassemble these circuits. Genetically modified viruses allow researchers to identify specific networks of nerve cells in the brain. This technique will allow scientists to distinguish which cells constitute a circuit and which roles the different cells have.

http://tinyurl.com/03-100606a

**Improved Antibiotics To Fight Against Pathogenic Agents**

Infectious diseases account for the biggest challenge in health care. An increasing number of disease agents become more resistant to known antibiotics. Thus, research has to find new ways of fighting against those pathogenic cells. Researchers from the University of Zurich have apparently come up with a new class of antibiotics that are more effective against strains of Pseudomonas aeruginosa. Even though infections from Pseudomas bacteria are relatively harmless for most people, they can be lethal for patients with weak immune systems. Prof. John Robinson’s group has therefore opened a breach in the fight against this type of bacteria, for which the latest antibiotics were developed 20 years ago.

http://tinyurl.com/03-100606b

**Fungi To Boost Rice Growth**

To survive and to optimize their growth, most plants establish symbiotic associations with special types of fungus. However, some crops like rice have a very modest or even inexpressible response to an inoculation from such organisms. Researchers from the University of Lausanne (UNIL) managed to stimulate this response by naturally manipulating the genetics of the fungi and thereby increasing the growth of rice by a factor five. This study is a promising step to boost the production of crops such as rice of manioc which were considered as “capital” in terms of intensive phosphate fertilizers and is an GMO-free approach.

http://tinyurl.com/03-100611a

**Breakthrough In Golden Staphylococcus’ Defense Mechanism**

For 40 years, a barrier has impeded scientists from studying virulence factors that make the golden staphylococcus so dreadful. A team of researchers from the University of Geneva, in collaboration with the Hôpitaux Universitaires de Genève (HUG), has found a means to remove this obstacle. This discovery is a step forward in the fight against this bacterium which is feared for its capacity to develop multiple resistance to antibiotics. The golden staphylococcus, being present in the bodies of about 30% of the population, is the source of serious infections, some of them lethal. These infections are normally treated with antibiotics but in half of the cases, the evolution of the infections is problematic since strains are relatively harmless for most people, they can be lethal for patients with weak immune systems. Prof. John Robinson’s group has therefore opened a breach in the fight against this type of bacteria, for which the latest antibiotics were developed 20 years ago.

http://tinyurl.com/03-100606b

**Drug Delivery Nanoparticles**

Thanks to nanotechnologies, it is now possible to build microcapsules and convey them in the body where they release drugs in the most effective way. These small gel particles can be controlled in size and orientation from outside a patient’s body. This is a promising advance combining magnetic and temperature sensitive materials that scientists from Fribourg have developed. The nucleus of a single particle is coated with a micro gel polymer network which swells with water depending on the temperature.

http://tinyurl.com/03-100614

**New Method For Bladder Cancer Detection**

Researchers at the EPFL have established a procedure where cancerous tumors in the bladder become fluorescent and are more easily discoverable under blue light. Bladder cancer is the fourth most common cancer in men and the eighth most common in women in the U.S. Being extremely difficult to detect in its early stages, even by the trained eye of a urologist, the importance of increasing its detection is paramount for the complete removal of the tumors which helps to delay tumor recurrence. The procedure drastically helps diagnostics and surgical removal. Future procedures could be used for colon cancer or other tumors found in the hollow organs.

http://tinyurl.com/03-100611e

**Improved Therapy Of Salmonella Infections**

The microbiologist Prof. Hardt from ETH Zurich has patented an alternative and enhanced probiotic Escherichia coli (E. coli) strains with increased competitive properties against diarrhea-causing Salmonella strains. E. coli strains are often observed in high numbers in the faeces of humans and mice suffering from S. Typhimurium diarrhea. During therapeutic treatment of an infected individual with the probiotic of interest, gene transfer is likely to occur. Natural selection will automatically enhance the growth of those clones which have acquired beneficial additional genetic information. These clones with improved properties can be isolated easily from the faeces of the treated individual without gene technology. The method can be developed for humans applications as well.

http://tinyurl.com/03-100616

**New Medicine To Treat Leukemia Patients**

After several clinical trials, the Tasigna drug reduces leukemia-causing protein faster than the Glivec (the actual widespread medicine), resulting in lower rates of cancer progression even as early as 12 months. Regulatory submissions are under way worldwide, with applications currently filed in the EU, Switzerland and Japan, after the U.S. Food and Drug Administration (FDA) approved Novartis’ newly developed treatment for patients diagnosed with chronic myeloid leukaemia, providing a major advance for people with this blood cancer.

http://tinyurl.com/03-100618a

**Real-Time Detection Of Embolism In Blood Flux**

Prof. Cédric Bornand from the Engineering and Management School of VD (HEIG-VD), together with the ABMI company and Fribourg’s School of Engineers and Architects, has developed an instrument which can control the brain’s perfusion and detect embolisms (air or solid) in blood. ABMI’s device emits impulses and records the echo, which is analyzed to output the blood’s flux composition. The core innovation of the NEUROMON project lies in its algorithm which allows a real-time classification of solid and gaseous particles. The device is easily portable and can thus be used in ambulances.

http://tinyurl.com/03-100618b

**Micro Worms To Protect Corn**

Every year, leaf beetles cause more than USD 1 billion-worth of damages; in Europe where it has become fluorescent and are more easily discoverable under blue light. Bladder cancer is the fourth most common cancer in men and the eighth most common in women in the U.S. Being extremely difficult to detect in its early stages, even by the trained eye of a urologist, the importance of increasing its detection is paramount for the complete removal of the tumors which helps to delay tumor recurrence. The procedure drastically helps diagnostics and surgical removal. Future procedures could be used for colon cancer or other tumors found in the hollow organs.

http://tinyurl.com/03-100611e

**Genetic Engineering To Fight Blindness**

Physicians from Basel and Lausanne have used genetic engineering to cure retinitis pigmentosa, the number one cause of hereditary adult blindness in economically developed countries. Scientists restore vision introducing a bacterial protein into the remaining but non-functional cone photoreceptors of the retina of mice. This process does not only reactivate the cones’ ability to interact with the rest of the visual system, it also prompts sophisticated visual functions. In fact, this protein restarts a cascade of mechanisms similar to those of a retina to convert luminous stimuli into nervous cone cells’ ability to interact with the rest of the visual system, it also prompts sophisticated visually guided behavior. In particular, the recovery of the visual system can be assessed in a test of visual acuity that has been developed in the laboratory of Prof. Hardt. The test is performed in a virtual reality environment with a computerized feedback, resulting in lower rates of cancer progression even as early as 12 months. Regulatory submissions are under way worldwide, with applications currently filed in the EU, Switzerland and Japan, after the U.S. Food and Drug Administration (FDA) approved Novartis’ newly developed treatment for patients diagnosed with chronic myeloid leukaemia, providing a major advance for people with this blood cancer.

http://tinyurl.com/03-100618a

**Micro Worms To Protect Corn**

Every year, leaf beetles cause more than USD 1 billion-worth of damages; in Europe where it has existed for twenty years, financial consequences could also be important. The diseased corn can defend itself by emitting a specific odorous message that entices natural enemies – small worms called nematodes – of the devastating agents. In an effort to yield a more efficient process, researchers from the University of Neuchâtel have succeeded in increasing nematodes’ reaction speed by following a thorough selection process. Open-fields experiments concurred lab tests.

http://tinyurl.com/03-100625b

**Physicians from Basel and Lausanne have used genetic engineering to cure retinitis pigmentosa, the number one cause of**

**hereditary adult blindness in economically developed countries. Scientists restore vision introducing a bacterial protein into the remaining but non-functional cone photoreceptors of the retina of mice. This process does not only reactivate the cones’ ability to interact with the rest of the visual system, it also prompts sophisticated visually guided behavior. In particular, the recovery of the visual system can be assessed in a test of visual acuity that has been developed in the laboratory of Prof. Hardt. The test is performed in a virtual reality environment with a computerized feedback, resulting in lower rates of cancer progression even as early as 12 months. Regulatory submissions are under way worldwide, with applications currently filed in the EU, Switzerland and Japan, after the U.S. Food and Drug Administration (FDA) approved Novartis’ newly developed treatment for patients diagnosed with chronic myeloid leukaemia, providing a major advance for people with this blood cancer.**
Bacteria To Explain Intestinal Flora

Researchers from the University of Bern have made new findings on the intestine immune system with the help of a self-grown bacteria. It does not only react to disease agents but also to harmless bacteria in the intestine itself. The underlying mechanisms of this behavior are explained by scientists who use a bacteria with special properties that colonize the intestine before disappearing from the body. The mutant agents induce the same immune response in the intestine that normal bacteria do, but they are incapable of decomposition. On one hand the immune system of the intestine can determine how strong an antibody response will be and on the other hand it is obvious to an appropriate antibody response. This fosters the development of specific inoculation substances.

http://tinyurl.com/03-100625e

Intelligent UV Sun Cream Filter

The Zurich-based start-up Blueshift, winner of the Venture Prize co-organized by McKinsey and ETH Zurich, has developed an innovative cream which adapts itself according to the intensity of sun rays. Bernd Walzel and Daniel Fitzgerald succeeded in finding an intelligent filter whose components induce a photochemical reaction that modifies the filter’s protection index from 15 to 30. The outlook is interesting since the solar market represents CHF 2.1 billion and increases by 8-10% every year. Norway and Switzerland are also the European countries with the highest number melanoma detected each year.

http://tinyurl.com/03-100629

Insulin Patch For Diabetics

Until now, the most widespread treatment against diabetes was an insulin injection using a syringe. Thus, many companies have focused on the development of an insulin patch to cure diabetes all over the world.

http://tinyurl.com/03-100629b

Bone Cotton Wool For Bone Regeneration

Given the world’s demographic shift towards an older population, an inevitable rise of orthopedic injuries and disease is expected. This has triggered research at ETH Zurich to find fully synthetic alternative bone substitute materials to those currently being used, which exhibit brittleness, are difficult to shape and have constricted bioactivity. Indeed, the combination of both a ceramic and a polymer within one material results in composites that have the ductility of a polymer and the bioactivity of the calcium phosphate phase. The resulting new Bone Cotton Wool is very flexible and easy to shape due to its cotton wool-like appearance. Besides bone regeneration, it can be used in dental applications.

http://tinyurl.com/03-100629d

Spinal Column Research In 3-D

Back pains or spinal column lesions should be better cured, thanks to the 26 research groups of a SNSF supported research program, which has been active for five years. One of the projects was to recreate the backbone in 3-D in order to get a better view of intervertebral discs, vertebral bodies, etc. The new method will assist physicians in diagnosing problems and the goal is to foster the development of implants for intervertebral discs’ prostheses.

http://tinyurl.com/03-100703

Silver Polymer Coatings Kill Bacteria Strains

Empa researchers have explained how different production conditions affect the properties of new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles. Using their results, they were able to tailor new polymer coatings containing silver nanoparticles.

http://tinyurl.com/03-100705

DNA-Repairing Protein Discovered

Researchers from the University of Zurich have discovered a new DNA-repairing protein. This protein and its mechanism help to better understand and treat hereditary diseases such as Fanconi anemia. More efficient treatments and cancer therapies will also be improved.

http://tinyurl.com/03-100708

Promising Treatment To Relieve Patients With Spinal Cord Lesions

Lesions of the spinal cord lead to paralysis and also to often unchecked and painful muscular contractions called spasms. Researchers from the University of Zurich and ETH Zurich have shown that rats treated to stimulate the growth of nervous fibres recover some of their motor capacity and suffer less from spasms. Martin Schwab and his team have developed antibody treatments that kill Nogo-A protein, responsible for hindering the growth of nervous fibres of the spinal cord after a lesion. These promising treatments and observations on rats might be carried forward to humans.

http://tinyurl.com/03-100713a

Network Of Genes And « Savoir Vivre » To Explain Longevity

Prof. Johan Auwerx and his team from EPFL write in a report that a complex network of genes combined with a low-calorie diet and physical exercise seem to be the basis of high life expectancy. Researchers have determined that longevity involves a network of roughly 750 genes, one third of them being very important notably in their ability to generate energy from food. This network is not the only factor affecting longevity. Certain habits of “savor vivre” with respect to food and physical activity also play a significant role. The next step will be to better understand the interactions between genes and these life modes and find chemical compounds that can reproduce them.

http://tinyurl.com/03-100713b

Silver Coating On Implants To Prevent Rejection Problem

Researchers from the University of Fribourg have discovered a new method to make implant surfaces inhospitable to bacteria. Thanks to an antibacterial layer composed of silver bonds, infections should not anymore happen in implant surgery. Prof. Frumin is working for the project «New Anti-Bacterial Coatings for Implant Materials» financed by the Swiss National Fund and her aim has been to solve the implant rejection problem caused by bacteria which are present on implant that multiply and cause chronic infections. These bacteria are difficult to treat because they are more and more resistant to antibiotics and because they are not easily reachable due to the poor blood supply on implants’ surfaces.

http://tinyurl.com/03-100714b

New X-Ray Technique

Traditional X-ray images can clearly distinguish between bones and soft tissue, with muscles, cartilage, tendons and soft-tissue tumours all look virtually identical. The phase-contrast technique developed a few years ago at the Paul Scherrer Institute (PSI) enables X-ray images to be produced that clearly distinguish between these tissue types. Researchers at the PSI and the Chinese Academy of Science have now further developed the technique to such an extent that, in the future, it will be as simple to use as conventional X-rays. They anticipate that the process will help tumours to be detected in medical practices and could also help identify hazardous objects in luggage at airports.

http://tinyurl.com/03-100722

Intercellular Communication

Prof. Paolo Dotto from the biochemistry department at the University of Lausanne has discovered the importance of a signaling path that plays an essential role in the good working of organs. It has been known since the beginning of the 20th century that the development of certain tumors is linked to the breakdown of communication between epithelial cells located at the surface of organs. A defect in this communication channel (the “Notch” communication channel) for sub lying mesenchymal cells, which generates organs their shape, can therefore impede the good functioning of organs.

http://tinyurl.com/03-100726F
New DNA Protein Discovered

Researchers from ETH Zurich and the University of Zurich discovered a new protein FAN1 that participates in the repair process of damaged DNA. This knowledge could be used when fighting against certain forms of cancer. It also helps to understand the underlying mechanisms of Fanconi anemia, a hereditary disease that increases the risks of cancer. Biologists were also able to describe the different functions of the protein, such as the cutting and degrading of DNA strands. Observations made on patients will be compared to the discoveries made Prof. Jiricny and his team to narrow down possible treatments.

http://tinyurl.com/03-100722

Assembly Of Protein Strands Into Fibrils

Researchers at ETHZ Zurich, EPFL and at the University of Fribourg have evidenced a basic general mechanism describing how filamentous proteins assemble into ribbon like structures, the so-called Amyloid fibrils. Combining experiments and theory, they could explain how denatured milk proteins assemble into ribbon like structures composed of up to five filaments. These findings are shining a surprisingly new light on the assembly of these proteins: single proteins build the long filaments and subsequently the filaments assemble side by side to form the ribbon-like twisted fibers. The ribbon-like structure is the logic consequence of the strong charge carried by the building blocks of the fibers.

http://tinyurl.com/03-100412a

New Treatments For Depression

Researchers from the Brain Mind Institute at EPFL reveal how understanding the functioning of a molecule called MIF, or macrophage migration inhibitory factor, may change the way we treat depression. They first detected a concentration of MIF protein in stem cells in the hippocampus, a key area for memory formation and neuron generation during adulthood. By genetically and pharmacologically manipulating the level of MIF in the hippocampus of rats, the researchers discovered that the absence of MIF decreases the production of new neurons. They also found that the lack of MIF decreases the ability of antidepressants to stimulate neurogenesis. These findings have led the researchers to conclude that MIF plays an important role in neurogenesis and, in turn, the condition of anxiety and depression.

http://tinyurl.com/03-100412b

New Genetic Sub-Code Discovered

Biologists and computer scientists from ETH Zurich and the Swiss Institute of Bioinformatics identified a new sub-code in genomic information that determines at which rate given products must be made by the cell. It provides novel insights into how the decoding machinery works, and more pragmatically, it makes possible to read information about gene expression rates directly from genomic sequences. Additionally, the new sub-code provides insight into cellular processes at the molecular level. The discovery of this novel sub-code will therefore also provide more information about the functioning of ribosomes, special factories allowing the production of proteins throughout translation.

http://tinyurl.com/03-100422a

Clinical Trial For New Tumor Fighting Drug

Debiopharm Group announced that it has started patient enrolment in its Phase I clinical trial for the small molecule inhibitor of heat shock protein 90 (Hsp90), Debio 0932. This trial will evaluate the maximum tolerated dose and safety of Debio 0932 in patients suffering from advanced solid tumors or lymphoma. The preclinical work carried out suggests that Debio 0932 may be able to enhance the efficacy of treatment against certain tumors, where there currently is a large unmet medical need. The new treatment has already shown efficacy in mice in various tumor xenografts.

http://tinyurl.com/03-100422b

Better And More Cost-Effective Medicine With Nanoscience

With the comprehensive introduction of managed care systems, it is possible to steer the whole treatment process centrally, which leads to a better quality of treatment and also contributes to preventing unnecessary measures. In view of the rapid development of nanoscience and nanotechnology, the question that arises is how to apply these new tools, techniques and materials for the benefit of human health. The government therefore has a strong strategic interest in supporting and encouraging this valuable effort in the field of nanomedicine in order to lay the foundations for better pub-
Telomere Research

For a long time researchers were convinced that telomeres are only "silent" elements of a chromosome, i.e. the cell machinery does not transcribe them into RNA (ribonucleic acid) as it does with normal genes. Claus Azzalin was suspicious about this dogma and turned out, his good instinct was rewarded. During his post-doc at EPFL Lausanne, he discovered that the telomere regions produce RNA with a repetitive sequence. The researchers call this RNA TERRA (Telomeric Repeat-containing RNA).

http://tinyurl.com/03-100201

New Treatment Against Prostate Cancer

Ipsen and Debiopharm Group announce the launch in France of Decapeptyl for the treatment of locally advanced or metastatic hormone-dependent prostate cancer. Decapeptyl is the new sustained-release 6-month formulation of a gonadotropin releasing hormone agonist analogue developed by Debiopharm Group. Debiopharm has licensed the marketing rights to Ipsen for all territories where Ipsen currently commercializes triptorelin. Launches are planned shortly, notably in Germany and Portugal.

http://tinyurl.com/03-100204

Anti-HIV Safety Trial

A research group attached to the University of Geneva receives CHF 4.5 mio from the UK's Wellcome Trust to pursue a safety trial for a "microbicide" that promises to protect women and children in poor countries from AIDS. The microbicide has proved both in the test-tube and in experiments with monkeys conducted in the United States to be extremely effective at combating HIV, the AIDS virus. The Wellcome Trust grant will allow the Mintaka Foundation to get the "microbicide which has been given approval by the ethical and government approval before the product can be tested in the field. This funding helps with the development of a solution that will ultimately take CHF 50 mio and many years to come to market.

http://tinyurl.com/03-100224E

Cancer Caused By Infections

One in every five cancers is caused by infection. To alert public opinion to this little-known fact, a massive campaign by the International Union against Cancer (UICC) on the theme of prevention updates us on the viruses and bacteria that can lead to the deadly disease. Under the umbrella slogan "Cancer can be prevented too" we are invited into a viral campaign, but not the kind that kills. We all know that getting plenty of exercise, keeping our weight down, limiting alcohol intake, avoiding smoking and exposure to sun are important to keep health odds on our side. What most of us don't realize is that prevention of infections, either through safe behavior or vaccination programs, can also help keep cancer at bay.

http://tinyurl.com/03-100205

New Vaccine Agent

A team of scientists manipulated and disarmed a virus coming from a mouse, in order to convert it into a vaccine agent. This agent provides a never yet achieved immunity against "T killer" cells. This new technology opens a road to promising therapeutic perspectives in the fight against mortal diseases like HIV/AIDS, C hepatitis, tuberculosis as well as some kind of tumors. Vaccines have to be safe and it was still to risky to test this virus as it was on a human being. In order to disarm it, researchers had to use a trick since it travels from a cell to an other making bubbles on a viral protein. The virus then uses this protein to attach itself to other cells before penetrating them, nest and finally reproduce.

http://tinyurl.com/03-100207F

New Step In Alzheimer’s Understanding

A study from EPFL’s Laboratory of Neuroenergetics and Cellular Dynamics in Lausanne may lead to new forms of treatment following a better understanding of how Amyloid-Beta found in cerebral plaques, typically present in the brain of Alzheimer’s patients, may lead to neurodegeneration. Researchers have studied how the functions of certain cells called astrocytes – which normally protect and transfer energy to neurons – are impaired when "possessed" by aggregated Amyloid-Beta. This new understanding could lead to more effective therapies for Alzheimer’s disease by trying to rescue astrocytic functions by deactivating the scavenger receptors.

http://tinyurl.com/03-100303a

Engineered Bacteria Produces Glycoproteins

E. coli is a well-known biological workhorse that can be used to produce recombinant proteins, but it is missing many of the functions required to modify proteins with sugar molecules. Researchers at ETH Zurich recently discovered that Campylobacter can do something that only eukaryotes like human cells can: attach sugar molecules to proteins following synthesis to produce glycoproteins. This means that different glycoproteins can now efficiently be produced, thus helping researchers to analyze the structure and function of individual glycoproteins in a more precise manner. Glycoproteins play a crucial role in biology found more frequently on the surface of cells than "normal" proteins and they participate in numerous cellular processes, such as cell to cell communication.

http://tinyurl.com/03-100305

New Hope Of Childhood Leukemia Treatment

Zurich researchers have found a new treatment approach which they hope will help young leukemia patients who don’t respond to conventional therapies. The Zurich University Children’s Hospital team, led by Jean-Pierre Bourquin, conducted their research around acute lymphoblastic leukemia (ALL), the most frequently occurring form, of which there are up to 70 cases a year in Switzerland and up to 1,000 cases in Europe. Chemotherapy normally triggers the cancers of cells to commit suicide. But in patients with a resistance to this treatment this doesn't happen. However, it was found that a low dose of obatoclax mesylate could influence the mechanism that controls programmed cell death, thus restoring the response to conventional anti-leukemia drugs when given in combination.

http://tinyurl.com/03-100306a

New Antibiotic Against Multi Drug-Resistant Pseudomonas

Swiss scientists have found a new class of antibiotics which target the multi drug-resistant and often deadly pseudomonas. Pseudomonas has a hard outer cell wall, making it difficult for a conventional antibiotic to penetrate it. What is more, if the antibiotic does manage the breach the cell’s defenses, the bacterium uses a pump action to get rid of it. The new antibiotic actually hits a protein which is in the outer cell membrane, so it’s a sort of battering ram direct onto this essential protein machinery in the outer membrane, which is responsible for building the outer membrane. Such bacteria account for an estimated 63 per cent of infections in hospital intensive care units. There is thus an urgent need for new drugs in the fight against this type of bacteria.

http://tinyurl.com/03-100315E

World Center For Tuberculosis Study

Tuberculosis still affects thousands of victims worldwide. And with the inauguration of a laboratory specializing in airborne pathogens EPFL has become one of the world centers for research in the domain one week before the World Tuberculosis Day. With this new laboratory, EPFL disposes an indispensable research tool in the fight against tuberculosis. The lab is open to researchers in EPFL and nearby universities in order to study in vivo strains of Bacillus anthracis, the air-borne pathogen causing tuberculosis. It is a matter of utmost concern for around 70% of the patients do not survive in the absence of effective treatment.

http://tinyurl.com/03-100316

Barrier Capacity of Human Placenta

Over several years, Empa researchers have been studying the effects of numerous nanoparticles on human cells and tissue. These investigations will help scientists to understand what problems these tiny things might cause when released into the human body and in the environment. Recently, scientists from Empa and the University Hospital Zurich have investigated the human placenta, injecting into it particles of different sizes. The first result of the study was that the cutoff size of the beads was between 200-300 nanometers, particles smaller than this crossing the placental barrier and entering the fetal circulation while larger particles were held back.

http://tinyurl.com/03-100319a

Understanding Gene Interaction

Understanding how genes interact with each other is of paramount importance in developing better gene therapies. However, current gene screening techniques cannot directly inform us how genes interact with each other. In order to better understand the biological processes of gene interaction, the Laboratory of Intelligent Systems (LIS) at the Ecole Poly-
Novel Resin For Efficient Oxidative Protein Folding

A resin was developed for efficient and practical oxidative folding of disulfide bond-containing proteins. The resin, which can be simply separated from the refolded protein and easily recycled, has great potential for diverse protein folding applications.

http://tinyurl.com/03-100325

Tumor Hiding System

A new mechanism explaining how tumors escape the body's natural immune surveillance has recently been discovered at EPFL. The study shows how tumors can create a tolerant microenvironment and avoid attack by the immune system by mimicking key features of lymph nodes. The discovery underscores the role of the lymphatic system in cancer and may open up new possibilities for cancer treatment. The tumor tricks the body into thinking it is healthy tissue and the researchers set out to understand how immune tolerance is induced by tumors, allowing them to progress and spread. Since most tumors progress only if they have escaped the immune system, this new understanding of one mechanism by which the tumor can bypass or hide from immune defenses is an important step towards future cancer therapies.

http://tinyurl.com/03-100324

Gene Network Against Gout

Researchers from the ETH Zurich have devised a new method for preventing and permanently eradicating the cause of gout. It involves implanting a biological network that regulates the uric acid levels autonomously through a network of genes called UREX. A uric acid sensor constantly gauges and controls the concentration in the blood and if the uric acid level reaches an alarming concentration, the sensor relays the information to a genetic circuit. This then makes sure that the third component of the network releases the correct amount of urate oxidase into the blood and that the uric acid level is restored to a healthy balance. The three components of the network thus communicate with each other and work independently and automatically – without any external assistance.

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Trigger-Inducible Drug Depot

A drug depot was developed which can be triggered by an orally available pill to release the embedded drug on demand in a dose-dependent way. The drug depot is expected to be applicable in many disease areas by the incorporation of specific payload drugs. A daily injection will be replaced by a daily pill.

http://tinyurl.com/03-100325

Spine Treatment Through 3-D Imaging

A new method developed by researchers within the framework of the National Research Programme “Musculoskeletal Health – Chronic Pain” (NRP 53) provides a three-dimensional view of spine movements. The researchers hope this will facilitate the development of new artificial disc replacements. A video x-ray machine, films the spine while a patient performs prescribed movements. A unique new image processing procedure then converts this data into a 3-D motion model. The researchers aim to develop a database for spinal movements from healthy people and patients which, in turn, would facilitate the development of new implants like artificial disc replacements.

http://tinyurl.com/03-100325

Viral Squatters Awakened

It is known that viral “squatters” comprise nearly half of our genetic code. These genomic invaders inserted their DNA into our own millions of years ago when they infected our ancestors. But just how we keep them quiet and prevent them from attack was more of a mystery until EPFL researchers revived them. The reason we survive the presence of these endogenous retroviruses is because something keeps the killers silent. Didier Trono and his team provide insights into evolution and suggest potential new therapies in fighting another retrovirus—HIV.

http://tinyurl.com/03-100325

Awards & Grants

European Grant For Geneticist

The geneticist and cell biologist Mariusz Nowacki from the University of Bern was awarded a “Starting Grant” by the European Research Council of CHF 2 million. His research focuses on the hereditary processes and he has discovered a new role of ribonucleic acid (RNA), the genetic information transmitter. Indeed, he found out that it was also responsible for genetically modifying the DNA. RNA molecules are also known to repair damaged genes. This international prize rewards Prof. Nowacki for his work on epigenetics, the study of cell properties that are passed on to daughter cells.

http://tinyurl.com/03-100735c

Grant Awarded For Diabetes Research

Prof. Pedro Herrera from the University of Geneva was granted USD 750’000 from the Juvenile Diabetes Research Foundation to conduct a research project on the improvement of the regeneration of beta cells (producing insulin) in the pancreas of mice affected by diabetes. The group had already shown that a regeneration process could take place in a certain transgenic type of adult mice thanks to a spontaneous reprogramming of alpha cells (that produce the glucagon hormone) into beta cells. The study will last three years and will help to explore the mechanisms of such a process. Earlier this year, Prof. Herrera was granted more than USD 1 million from the Institute of Diabetes and Digestive and Kidney Diseases Special.

http://tinyurl.com/03-100715

Alexander-Von-Humboldt Prize At ETH Zurich

The ETH Zurich Prof. Ulrike Kutay has been awarded the Alexander-von-Humboldt Prize with a total prize money of EUR 5 million. Together with her team, she focuses on the structure, functions and dynamics of the nucleus of eukaryote-cells. For example, she studies how the envelope of a cell builds itself before mitosis (cell division). She is world-famous for her research on the transport of bulky molecules through the nucleus. The prize is awarded by the German federal ministry for education and research to scientists who are active abroad and plan to continue research in Germany in the future.

http://tinyurl.com/03-100616b

Latsis Prize Award

Mirjam Christ-Crain - the Basel medical professor who received the prestigious Latsis Prize for 2009 - knows a lot about the effects of stress. The 35-year-old doctor won the prize for her outstanding work into hormones and stress hormones in pneumonia and strokes. Christ-Crain’s first studies looked into the diagnostic value of the hormone procalcitonin in pulmonary infections, such as pneumonia. These infections can be both bacterial and viral, but only bacterial ones need antibiotics.

http://tinyurl.com/03-100616b

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