

PRESIDENT'S SELECTION

The Newsletter from the ETH Zurich President

www.ethz.ch

HIGHLIGHT

Diabetics wave goodbye to daily jabs



A fact of everyday life for many diabetics: the insulin injection.

Diabetes sufferers can look forward to a vast improvement in their quality of life: a research team from ETH Zurich has developed a gel that could make daily insulin injections a thing of the past.

Switzerland's 300,000 diabetics must inject themselves with insulin on a daily basis. For many of them, this is far more than simply a burdensome procedure, as every jab carries with it the risk of infection.

Science is treading new paths in search of a better solution. Now, an international research team made up of biologists, polychemists and material scientists from ETH Zurich and Zurich University Hospital has developed a groundbreaking new technique that could replace the need for daily injections.

With this treatment, the patient simply injects a gel-like substance as a medication deposit every two to four weeks. The gel consists of minute polymer threads to which proteins are attached. Once in the body, the gel takes the form of a small lump that contains the insulin.

When the diabetes patient then takes in tablet form the antibiotic, Novobiocin, a defined

amount of the gel is dissolved and the desired dosage of insulin is delivered into the bloodstream. This means that diabetics can dispense with daily injections and swallow a pill instead.

Dosable insulin amount

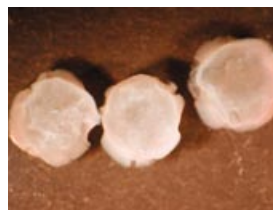
"By altering the dosage of the antibiotic, you can control exactly how much of the medication is released", explains Wilfried Weber, group leader at the new Department of Biosystems at ETH Zurich in Basle.

Although Novobiocin has few side effects, there is always a chance that bacteria could become resistant to it. Consequently, a second generation of the gel is being developed that should

be effective without the antibiotic.

The blobs of gel that make up the insulin deposit can be implanted in the body without any misgivings. "The clinical studies show that the polymers are excreted through the kidneys", assures group leader Weber.

The new gel is a prototype and the patent has already been registered. The medication deposit



The blobs of gel dissolve in the body and release a defined amount of insulin.

is also suitable for administering other protein-based medicines. Further tests on the technique are now due. As a rule, clinical trials for new therapeutic approaches last five to seven years.

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EDITORIAL

Important basis

Dear Reader,
Basic research is often misunderstood. People picture other worldly scientists singlehandedly carrying out experiments in their ivory towers.



However, the reality is quite the opposite. Interdisciplinary teams use state-of-the-art methods to develop the basis for future technological leaps. It might take such advances ten years or even several decades to materialize.

The Swiss populace deems education, research and innovation to be the country's most important resources. However, it is not only short-term, attainable results but also long-term investments that are crucial for the future of the country. This includes basic research, an area in which Switzerland excels on many fronts.

The aim of this newsletter is to present a small sample of the wealth of research that is carried out at ETH Zurich. Thank you for your interest.

R. Eichler

Prof. Ralph Eichler,
President ETH Zurich

"QUOTE ... UNQUOTE"

«Wanted are people with social qualities rather than introverted technophiles»

ETH Zurich professor Anton Gunzinger on the job profile for junior employees in the IT industry (IT open day, 8/29, Zurich)

ENERGY RESEARCH

ETH ZURICH SPIN-OFFS

LATEST



Free from harmful emissions: residence planned in Zurich.

House of the future

All over the world, heating and air-conditioning systems are contributing to the problem of rising CO₂ emissions. At ETH Zurich's Chair of Building Systems, however, techniques have been developed that could prevent buildings of the future from producing any pollutants at all. This utopian dream is now to be tried and tested on an actual building for the first time.

"The decarbonization of property is a priority goal", says Hansjürg Leibundgut from the Institute of Building Technology. By this, the ETH Zurich professor means that buildings should be able to be supplied with energy without CO₂-emitting energy sources – an aspiration that has also been incorporated into ETH Zurich's new energy research strategy.

Leibundgut's concept applies a clever combination of innovative technologies – including ramified piping on the outer wall of the building in which water is circulated from a depth of 200 meters, cooling the building in summer and heating it in winter using a heat pump. There are also provisions for heat recovery from the waste water. The first such system is due to be installed as part of a new building in Zurich next year.

Info on the project B35: www.viaggiata.ch

Attractive start-ups

Start-up companies that put ETH Zurich knowledge on the market are a promising investment opportunity for venture capital, concluded a study conducted by the London Business School.

In addition to research, ETH Zurich also performs other central tasks that are to the benefit of the economy and society as a whole, such as training highly skilled engineers and scientists, most of whom go on to work in the private sector after obtaining their degree.

As well, by establishing Switzerland as a location for technology transfer through spin-off companies, ETH Zurich is doing its part towards increasing the prosperity of Switzerland. A study due to be published in the coming weeks will reveal that spin-offs which transform ETH Zurich research results into products and services are particularly adept at surviving. Furthermore, the number of jobs they create is above average compared to other start-ups in Switzerland.

Venture capital increases chances of success

Especially revealing is another result of the study: ETH Zurich spin-offs with venture capital backing are considerably more successful as regards return on investment (ROI) than those without additional external funding. This finding calls on both investors and the university to take action.

An appeal thus goes out to possible venture capitalists to become more involved in ETH Zurich technology-oriented spin-off companies at as early a stage as possible. As the statistics prove, the investments pay off, not to mention boosting Switzerland's power to innovate.

The study will be published in book form by ETH transfer. See: www.transfer.ethz.ch (from end Sept.)

New professorships

The acquisition of donor money has triggered a hive of activity. For example, three professorships are currently being advertised that will be funded by the ETH Zurich Foundation. Two chairs in the energy sector and one in the field of integrative risk management are set to reinforce the university's core competencies.

Point of contact with China

The network of Swiss Houses for Advanced Research and Education, Swissnex, has gained a further branch in Shanghai. As Leading House in a program for bilateral research cooperation with China, ETH Zurich will be working more closely with this latest Swissnex branch, and with the University of Zurich as the Associated Leading House.



It's time to build!

The foundations for the new Monte Rosa Hut have been laid. ETH Zurich developed the environmentally-friendly pioneer work in conjunction with the Swiss Alpine Club (SAC). The architecture and technology used is set to serve as an example of durable and resources-sparing construction.

ETH ZURICH RESEARCH ON CAMERA: ROBOT FLEET IN WAREHOUSE



Instead of people on fork trucks, in future autonomous transport machines will be the ones looking for the next processing location for their goods.

No bigger than a vacuum cleaner, the indefatigable robots were developed by the American company Kiva Systems and ETH Zurich professor, Raffaello D'Andrea, from the Measurement and Control Laboratory. The team received the prestigious IEEE/IFR Award for their work in June.

FINAL WORD

Gyro Gearloose at ETH Zurich

ETH Zurich has become the first European university to embark on an industrial research and development partnership with the Walt Disney company. The world-famous entertainment concern is looking to draw on ETH Zurich's brain pool in computer animation and visual computing for research, which demands the highest of standards in hard and software.

We hope that this will mean that Gyro Gearloose will be making an appearance at ETH Zurich from time to time. The illustrious and ingenious inventor from Duckburg is sure to inspire our engineering students to great – and innovative – heights.