In Search of Excellence
- the International Competition for Talents and Innovation

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Innovation

How to stimulate and “control” it?

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### GCI 2010–2011

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• Quality of the educational system
  2

• Quality of scientific research institutions
  2

• Brain Drain / Brain Gain
  1

• University-industry collaboration in R&D
  2

• Company Spending on R&D
  2
Rate of Age-Group Qualifying for Academic Studies

- Roland Siegwart - ETH Zürich
We don’t have a specific innovation strategy and no direct funding for R&D activities at companies!

But we have a culture

… where innovation happens

… where people learn and do what they do best

… where excellence and autonomy exists on all levels

… where those people decide, that should decide

However …

… innovation is endangered by increasing regulations
ETH’s Pathway to Excellence and Innovation

- get the best talents
  - the most gifted students
  - the most creative engineers
  - the most brilliant scientists
  → “The university is the professors” (I. Rabi)
- give them autonomy and academic freedom
  - allowing them to follow up on their visions and crazy ideas
  - creating the required “enabling culture”
  - build on trust instead of controlling
- team up with industry and society
  - to address the big societal challenges and accelerate technology transfer
ERC Grants – a Measure for Excellence

ERC Starting grant calls 2007 – 2011
ERC Advanced grant calls 2007 – 2011

Grantees moving to the country ("ERA" & "non-ERA" nationals)
Grantees staying in the country: "Non-ERA" nationals
Grantees staying in the country: other "ERA" nationals
Grantees staying in the country: nationals of that country

Number of Grantees

Country of host institution

UK DE FR NL CH IT ES SE BE AT DK FI HU NO EL IE PT PL CZ CY BG EE TR IS

StG&AdG 2007-2011

Roland Siegwart - ETH Zürich
Stimulating Innovation and Entrepreneurship

Student Projects
(eg. Focus-Projects)

Pioneer Fellowships
Since 2010

Jan Lukas Giesbrecht
PlyEx: the ultra-high performance monolithic composite

Spin-off Support
Focus Project - Getting students excited about I&E

NanoSoccer
– World Champion Built by Student

Skye
– the Ultimate Unmanned Airship
Pioneer Fellowships – from discovery to entrepreneurship

- Since 2010
- 150 kFr. for 18 month

Robert Adelmann
BaToo: Mobile phone-based barcode scanning

Jörg Albuschies
Low-cost medical diagnosis device based on disposable silicon nanowire technology

Alexander Hasser
Monolithic Morphing Airfoil

Ferdinand Felder & Mohamed Rahim
Compact mid-infrared tunable VECSEL using MEMS micro-mirror

Jan Lukas Giesbrecht
PlyEx: the ultra-high performance monolithic composite
237 spin-off companies founded at ETH Zurich between 1996 and 2011

- 90% survival rate after 5 years
- Creation of thousands of new jobs

Swiss Technology Award 2010

- ICT
- Biotechnology and Pharma
- Electrical Eng. and Electronics
- Medical Devices
- Micro- and Nanotechnology
- Mechanical Eng. and Aerospace
- Others
- Advanced Materials
- Chemical Processes
- Sensors and Analytics
Strategic Partnerships (companies)

Energy, Environment and Sustainability
- ewz
- EKZ
- ALPIQ
- BKW
- aexo
- jura
- ALSTOM
- ABB
- Holcim
- SIEMENS

Science and Technology for Health
- Zürcher Kantonalbank
- PHILIPS
- KPMG
- Microsoft
- KABA

Information and Complexity
- ZURICH
- KPMG
- BASF
- OKIA
- IBM
- nagra
- GLENCORE INTERNATIONAL AG
- Stump

Materials, Technology and Processes
- NOVARTIS
- Osram
- HUBER-SUHNER
- Dätwyler
- accenture
- Basler & Hofmann
- United Technologies
- WALO

- HILTI
- FRANKE
- BÜHLER
- avaloq
- GEBERIT
- CREDIT SUISSE
- CONGREX
- welti-furrer

around 200 Mio CHF in the last four years!
Innovation requires sustainable collaborations.

ieLab
an ecosystem for discovery, innovation and entrepreneurship

Entrepreneurial Scientists
New Technologies
Industry Spin-offs

Discoveries

Integrative Approach

Natural Science

$\leftrightarrow$

Basic Science

Explore

Innovate

Clinical Research

Engineering Science

$\leftrightarrow$

Industry / Clinics

Engineering / Clinical Research

Innovation requires sustainable collaborations.
Striving for Excellence
the International Competition for Talents and Innovation

- Build a true European academic market
- Focus on people (e.g. ERC grants, Marie Curie)
- Sustainable long-term funding
- Don’t spread the funding
  → few outstanding instead of many mediocre researchers
- Be carefully with big programs (EIT KIC, FET Flagships, …):
  - Coordination scale poorly with the size of the consortium
  - Interactions happen in the lab and at the coffee machine, and less in meeting rooms
  - Industry is not interested to collaborate with large consortia (control of IP)
Horizon 2020

... has the ingredients to make a change

Some Key Drivers

→ developing, attracting and retaining research talent
→ improving access to the best infrastructures
→ strategic investments in key technologies e.g. advanced manufacturing, micro-electronics
→ creating and supporting innovative SMEs

Simplifications

→ Single set of simpler and more coherent participation rules
→ New balance between trust and control
→ single flat rate, and simplified financial regulations
Take-Home Message

- It’s about **talents** – quality before quantity
- It’s about **trust** and **high autonomy**
- It’s about **sustainable** and **solid basic funding**
- It’s about **strong partnerships** with industry
- It’s about **embracing bottom-up initiatives**
- It’s about **impact**, combining **rigor** with **relevance**
- It’s about **passion**, **dedication**, **belief** and **perseverance**