Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Jak nastavit inovační systém: CH model pro ČR?

Nobelovy ceny nebo návratnost investic?
... nebo snad obojí?

2. června 2015
14:00 h
CERGE-EI, Politických vězňů 7, Praha 1

Prof. Ivan Lefkovits
University Hospital Basel

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Jak nastavit inovační systém: CH model pro ČR?

Nobel Prizes or Return of Investment?
... or Perhaps Both?

2. června 2015
14:00 h
CERGE-EI, Politických vězňů 7, Praha 1

Prof. Ivan Lefkovits
University Hospital Basel

1969

basic research	applied research

University of Basel

supported by

SNF
Swiss National Science Foundation

Schweizerische Nationalfonds zur Förderung der wissenschaftlichen Forschung, SNF

Research departments of pharmaceutic companies:

Roche
Ciba
Geigy
Sandoz

1969

basic research	applied research
University of Basel Decision by Roche (followed soon by others) to invest in basic research	Research departments of pharmaceutical companies: Roche Ciba Geigy Sandoz

SNF
Swiss National Science Foundation

1969

basic research	applied research

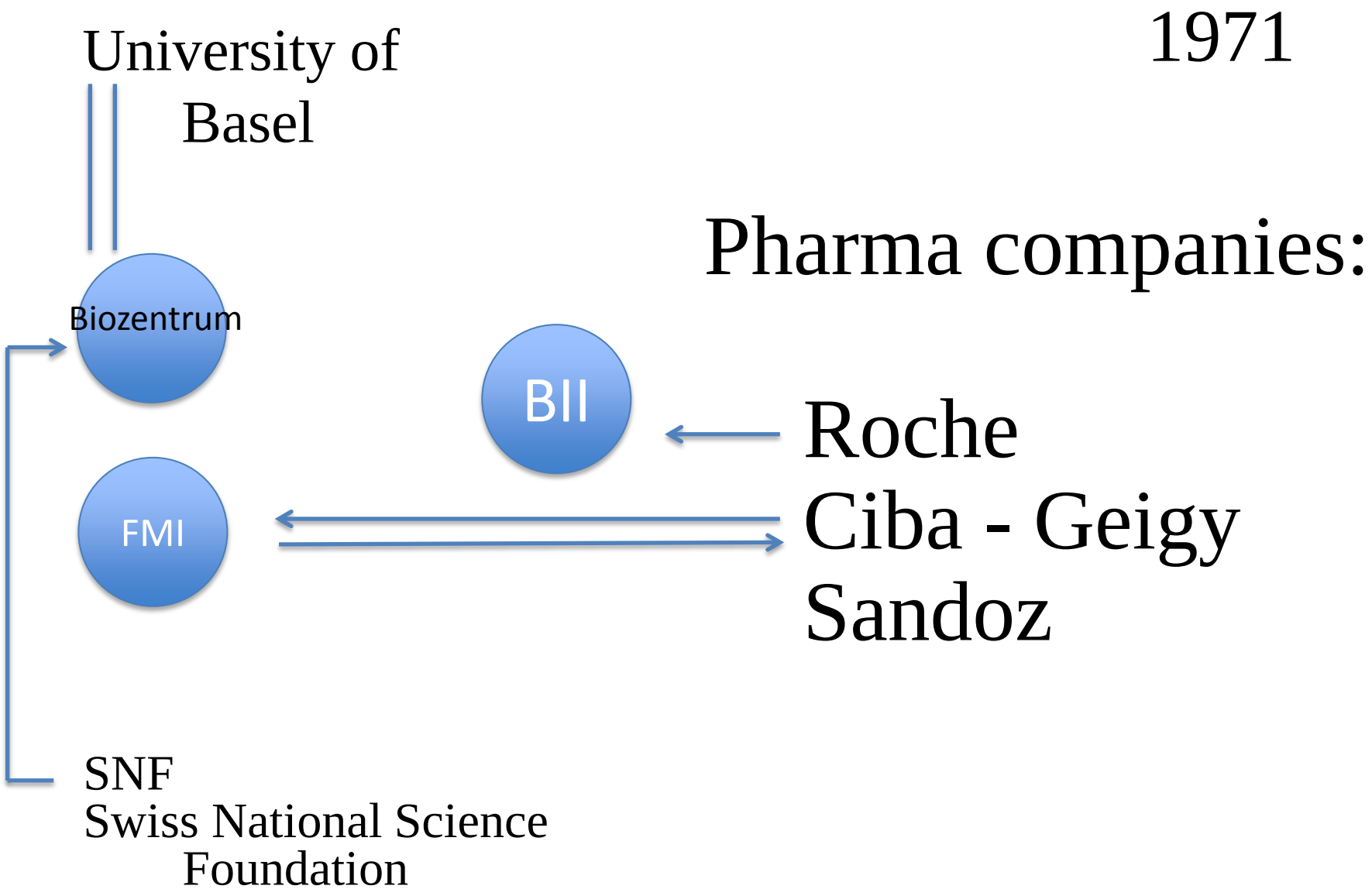
University of Basel

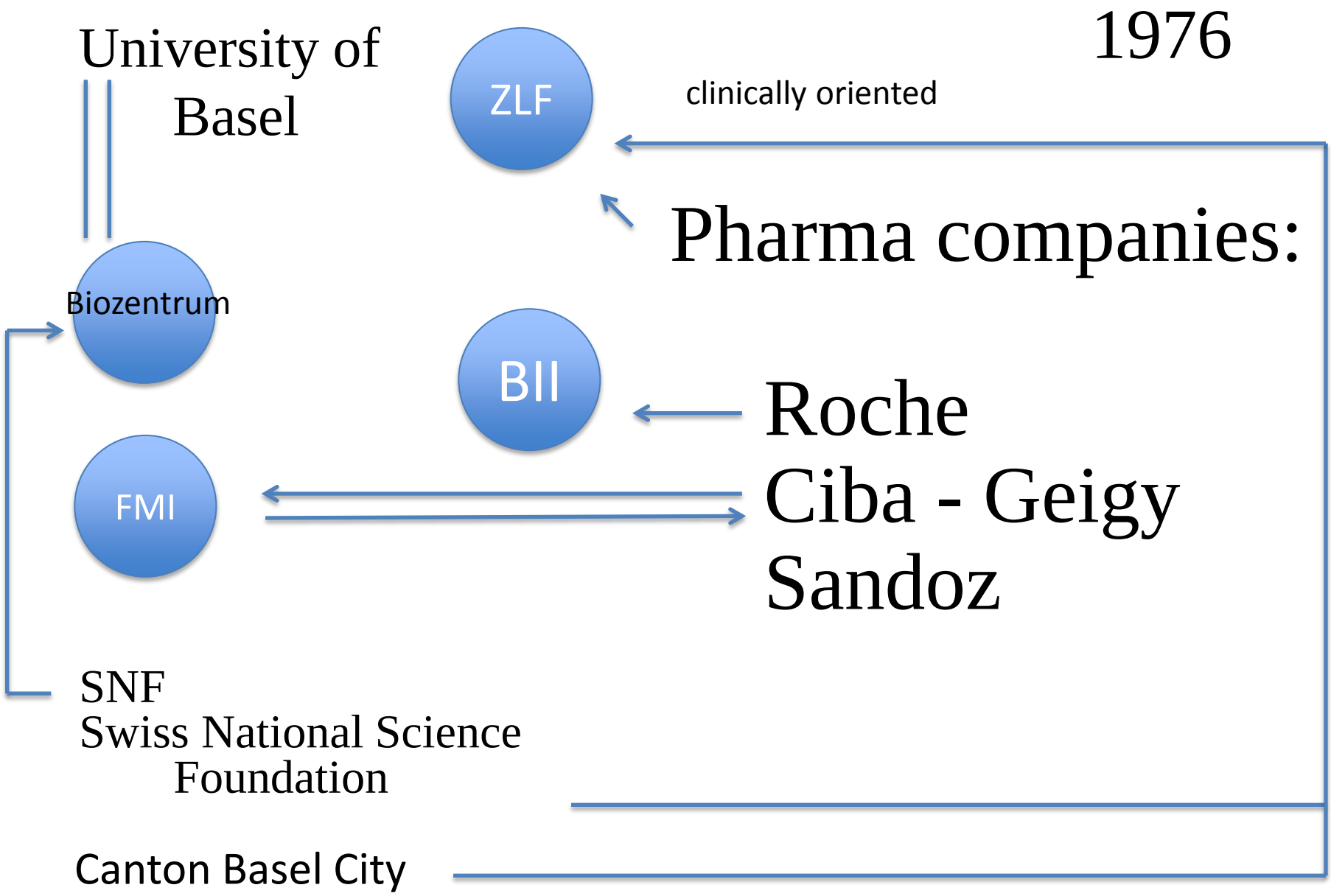
Decision by Roche (followed soon by others) to invest in basic research

SNF
Swiss National Science Foundation

Research departments of pharmaceutical companies:

Roche
Ciba
Geigy
Sandoz


University of Basel
1971
Pharma companies:
Biozentrum
BII
Roche
FMI
Ciba - Geigy
Sandoz
SNF
Swiss National Science Foundation


1976
University of Basel
ZLF
clinically oriented
Pharma companies:
Biozentrum
BII
Roche
FMI
Ciba - Geigy
Sandoz
SNF
Swiss National Science Foundation
Canton Basel City

BII and the horizontal structure

Small big institute

- 50 scientists
- 50 technicians
- 50 auxiliary personnel

ten permanent members

40 positions with 2 – 3 years contract

---

no bosses, free academic atmosphere

Pharmaceutical industry finances

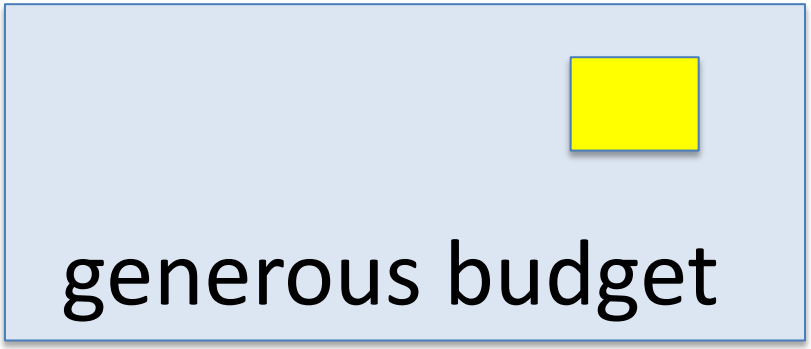
It‘s own R & D

Basic research

Research at universities

Endowments & professorships

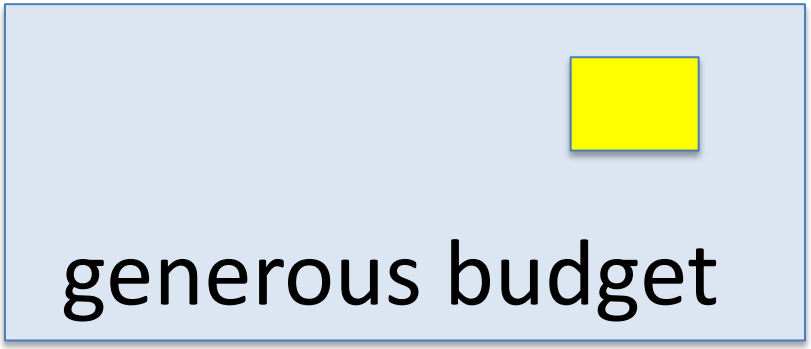
Basel Institute for Immunology



free choice of projects
– no strings attached

patents belong to the
mother company

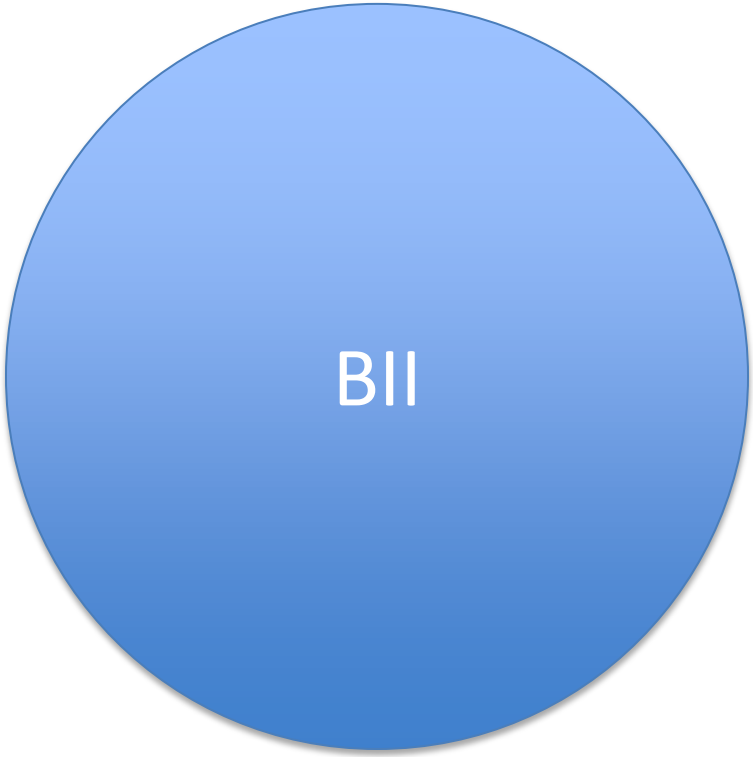
Basel Institute for Immunology



ca 30 x 10^6 CHE

1971

Instead of a
monolithic approach



up to 50 independent
research projects

common theme antibody specificity

1973

100 Most Cited Swiss Papers of 1973-1988: Percentage Share By Institutions

1	University of Zurich	14.0%
2	Basle Inst. Immunology	13.8%
3	University of Geneva	12.2%
4	ETH, Zurich	7.7%
5	University of Basle	6.3%
6	University of Bern	5.3%
7	Hoffmann-La Roche, Basle	4.5%
8	F. Miescher Inst., Basle	4.0%
9	Swiss Inst. Exp. Cancer Research, Lausanne	3.3%
10	IBM Corp., Ruschlikon Sandoz Ltd., Basle	2.0% 2.0%

NB. Owing to a higher average rate of citation in the life sciences than in the physical sciences, this list favors institutes that conduct biological and medical research. SOURCE: ISI's Science Indicators

common theme antibody specificity

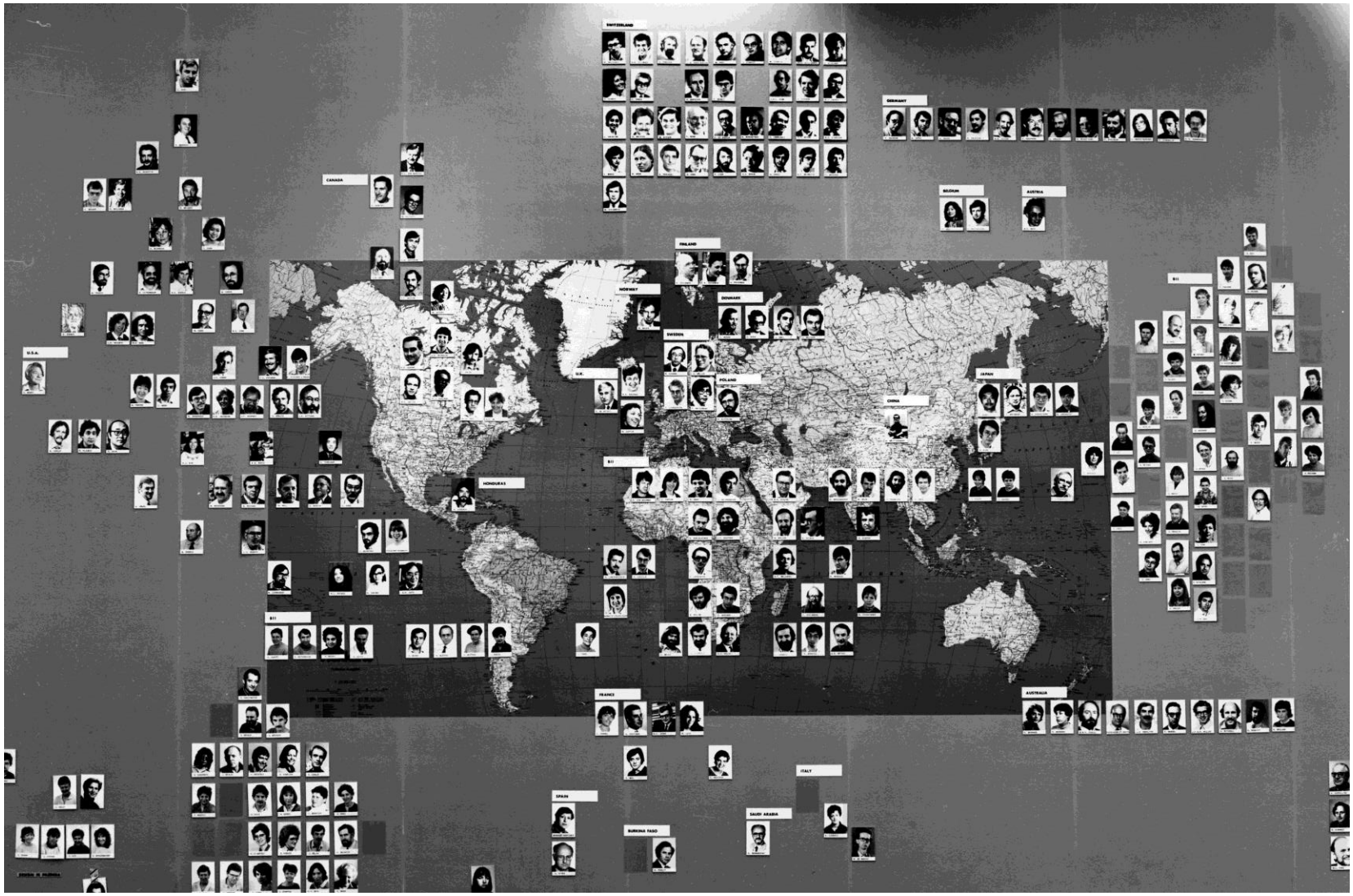
1973 and years to come

Knowledge base of Switzerland and of the whole world expanded

Turnover of scientists from prestigous universities to prestigious institutions in basic and applied reesearch

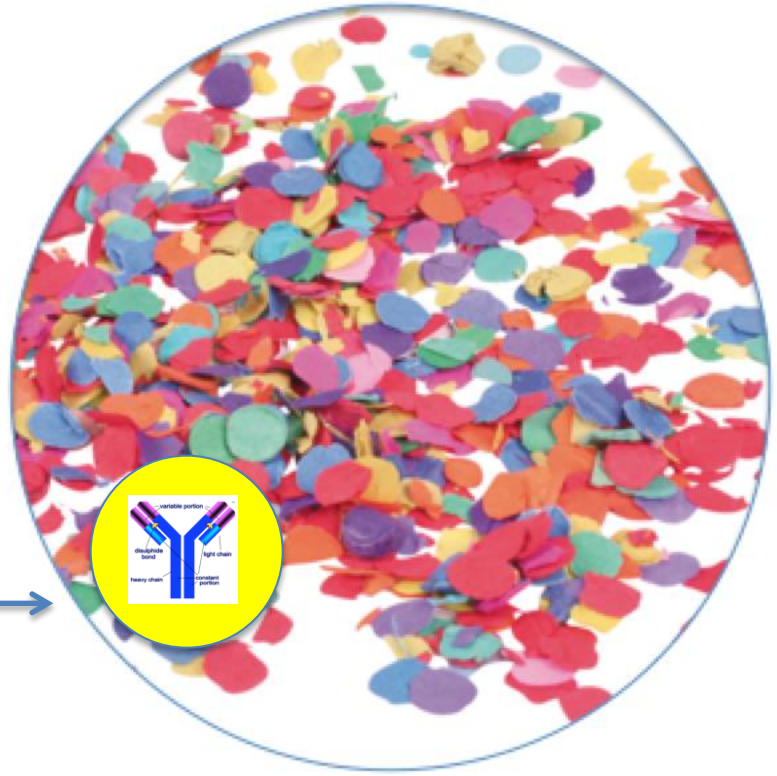
common theme antibody specificity

BII - worldwide



1976

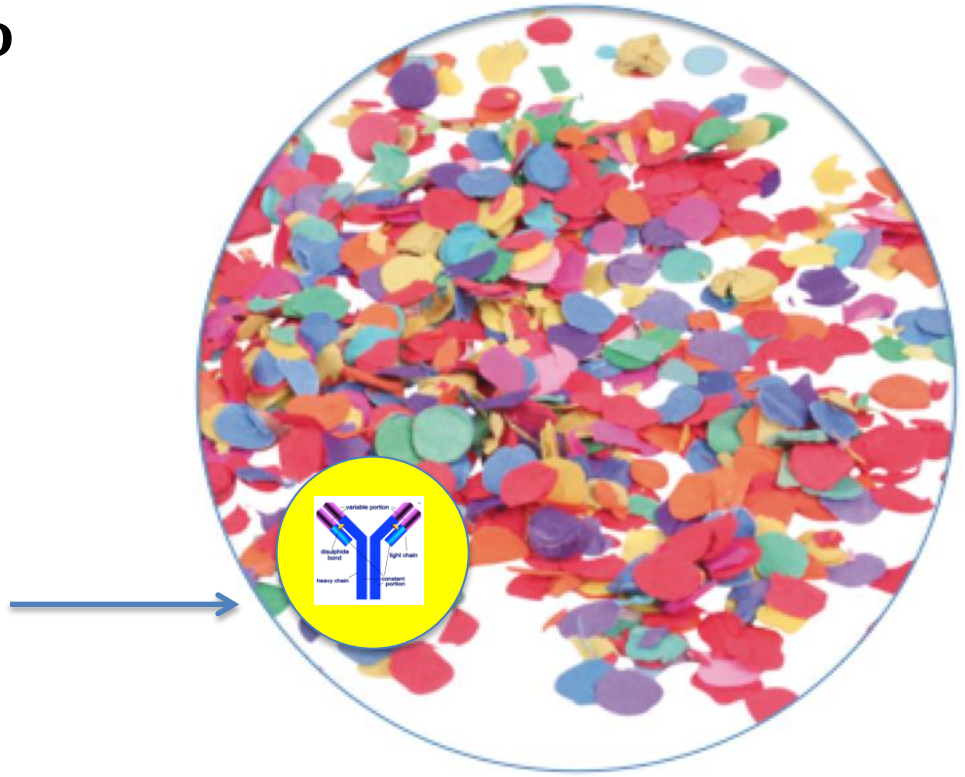
Discovery of monoclonal antibodies



common theme antibody specificity

Question:

Expand the research towards monoclonal antibody?



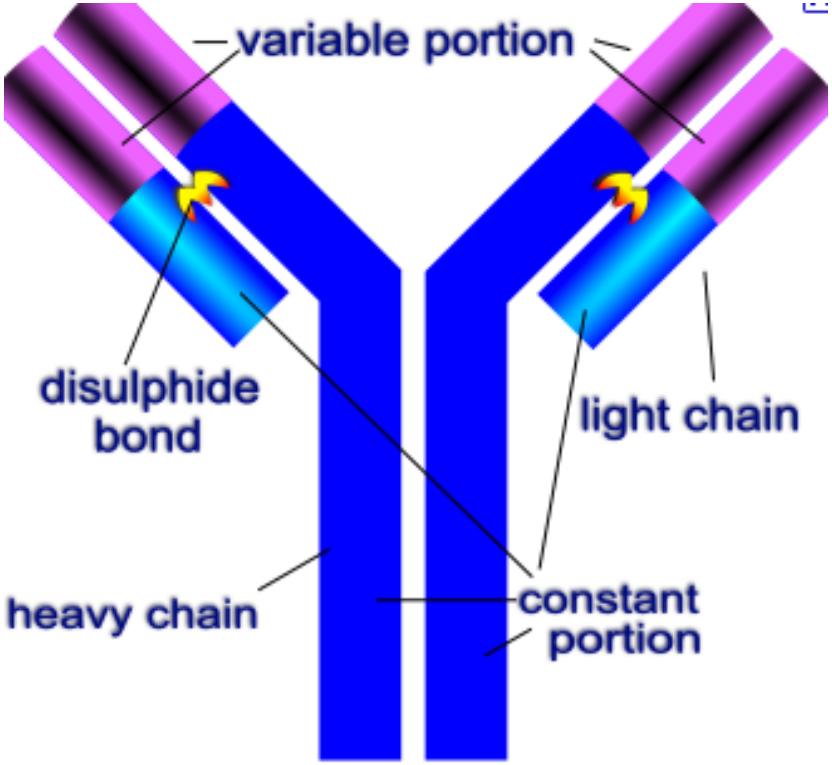
Answer:

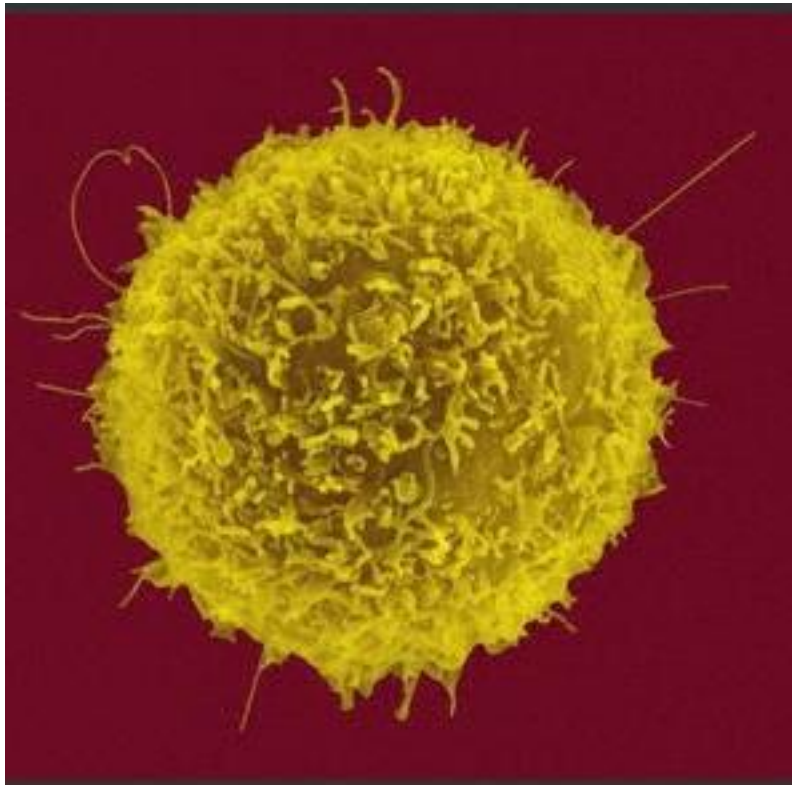
No because it could occur only upon diminishing other research activities

Solution:

Transfer the development to the “mother company”

antibody & lymphocyte

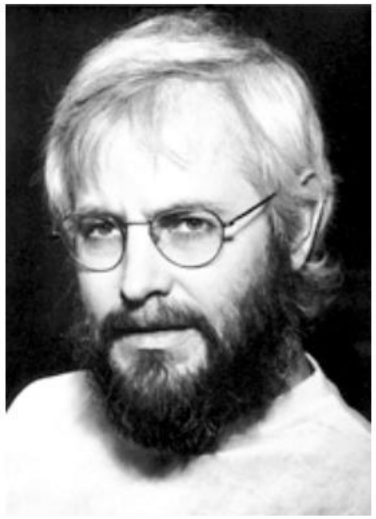




1984 Nobel prize

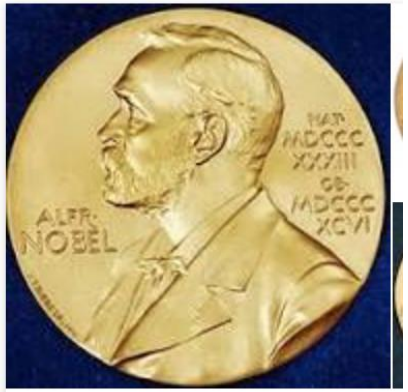
Niels K. Jerne

Prize share: 1/3



Georges J.F. Köhler

Prize share: 1/3



1987 Nobel prize

Susumu Tonegawa

Success story?

- Pharmaceutical company starts an Institute
- Basic knowledge is acquired
- 30 years of successful work
- Fame, success, Nobel prizes
- Side product: monoclonal antibody (mab)
- At present the main revenue from mab

The path from basics to a mab

If you know the biochemical pathway you might identify the biomarker

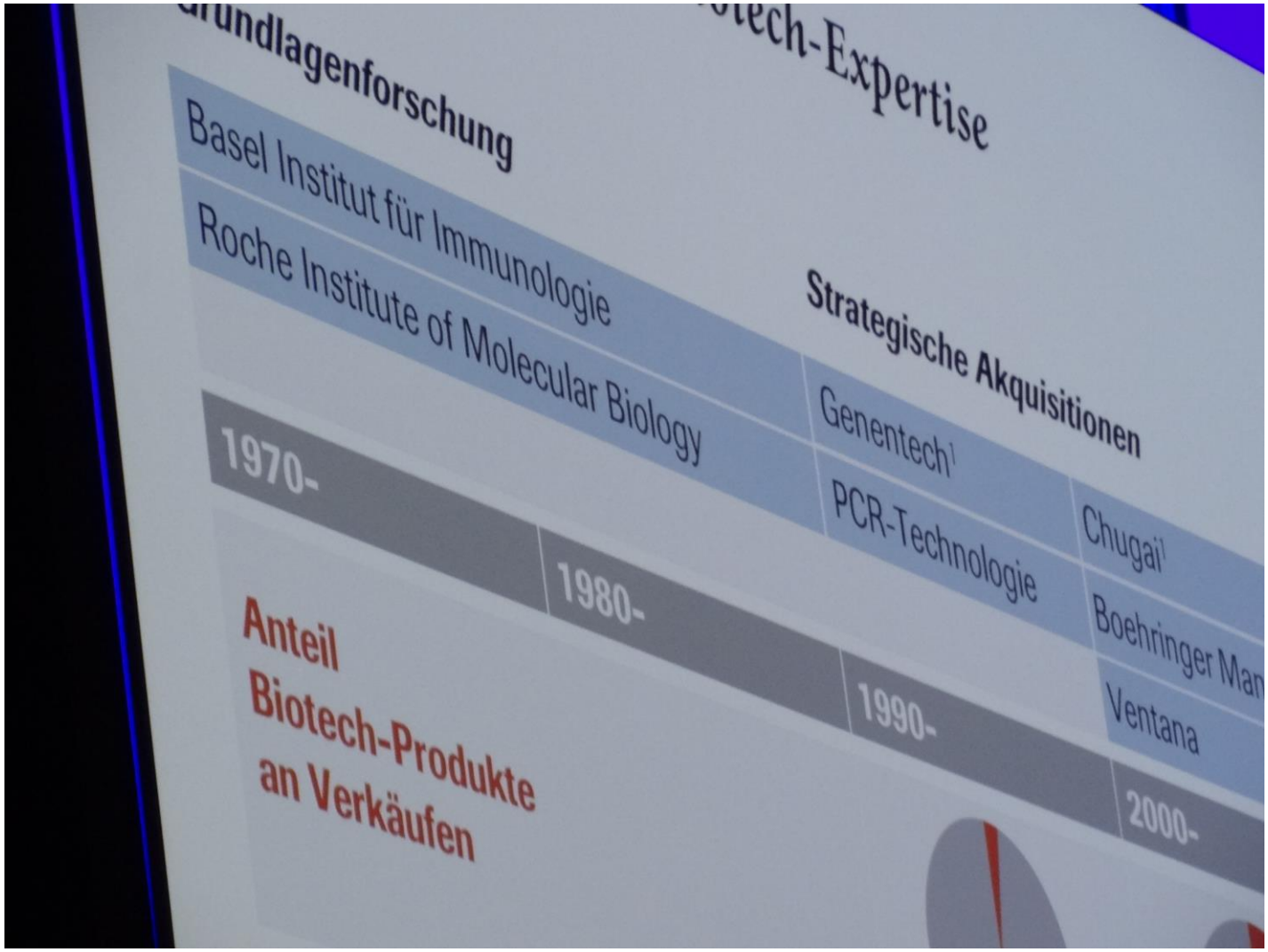
If you know the biomarker you might have a target

If you have a target you might be successful in making monoclonal antibody

Achievements of BII

- Opportunity of doing science at highest level for some 500 scientist
- Transfer of ideas and knowledge to over 300 institutions
- Thousands of publications in high impact journals
- Network of scientists persisting until these days

Strategy of Roche

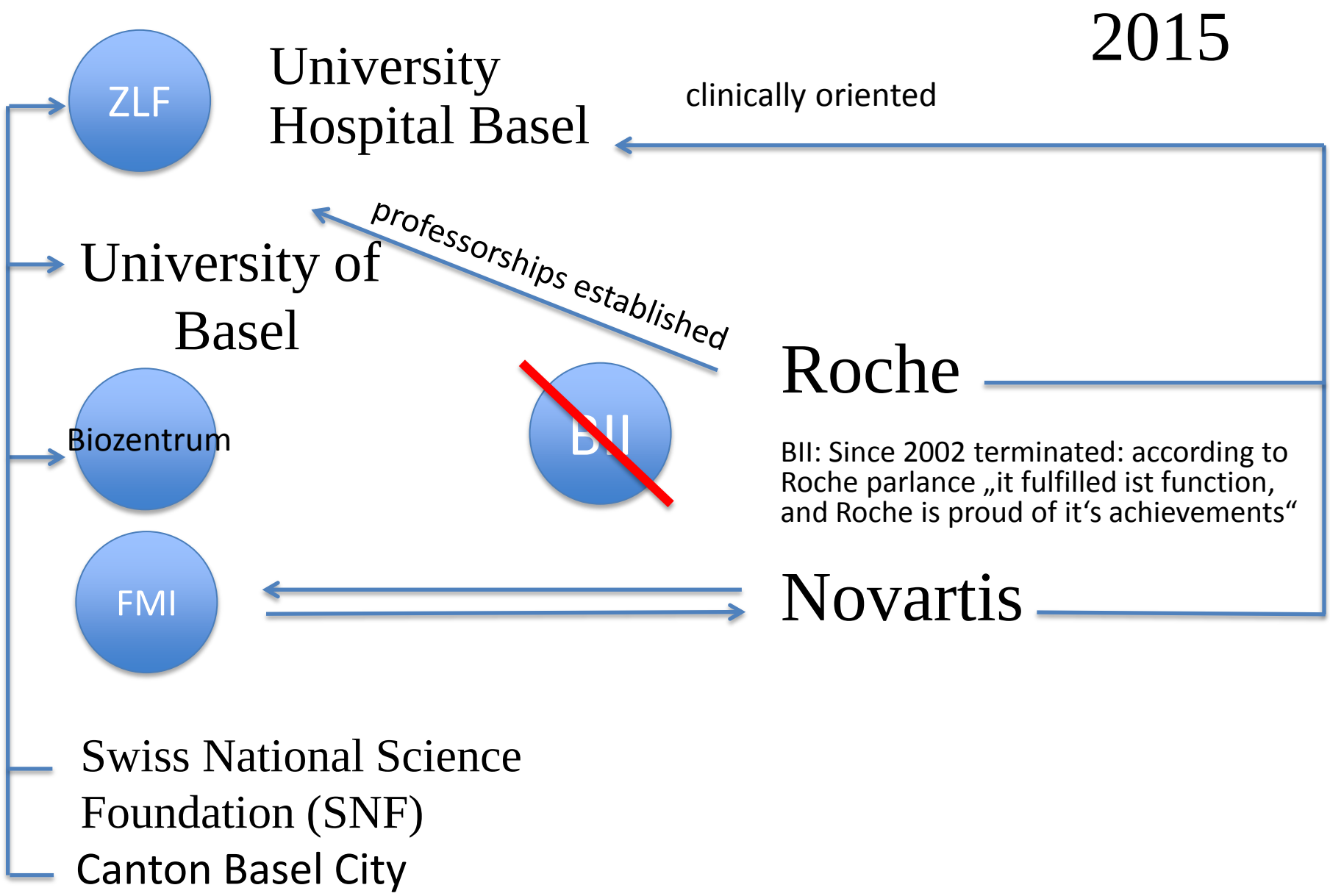


Roche

- Herceptin
- Kadcyla
- Avastin
- Perjeta
- MabThera

mab = monoclonal antibody

- Herceptin (trastuzumab)
- Kadcyla (trastuzumab emtansine)
- Avastin (bevacizumab)
- Perjeta (pertuzumab)
- MabThera (rituximab)
- GA101 (obinutuzumab) progression-free survival in patients with chronic lymphocytic leukemia (CLL)


2015
ZLF
University Hospital Basel
clinically oriented
professorships established
University of Basel
Biozentrum
BII
Roche
BII: Since 2002 terminated: according to Roche parlance „it fulfilled ist function, and Roche is proud of it‘s achievements“
FMI
Novartis
Swiss National Science Foundation (SNF)
Canton Basel City

Take home lesson:

- *Industry supports industrial research*
- *Industry supports basic research*
- *Industry does not get support from the state*
- *Basic research is supported both by industry and from the state budget*
- *Basic research is not geared towards profit*
- *Basic research cannot make promises on return of investment*
- *Risk: success does occur or not*
- *Without basic research industry stagnates*