



**19th Regional Cluster Seminar, Tokyo, Sept 6th 2005**

**Switzerland – One Nation – One  
Biotech Cluster**

**SUPPORT ACTIONS FOR  
SWISS BIOTECH**

Oreste Ghisalba  
Head of CTI Biotech  
The Innovation Promotion Agency CTI



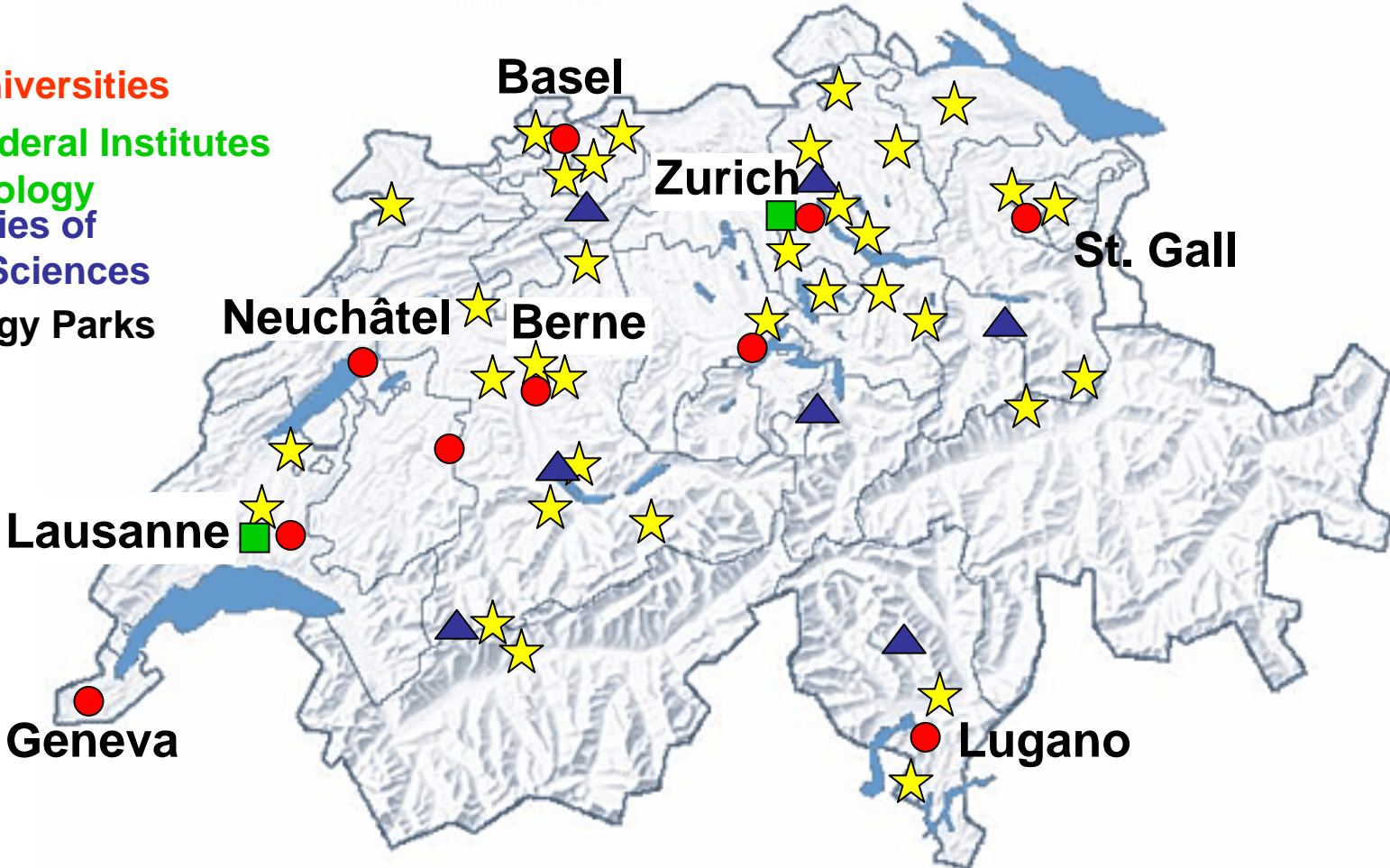
# Strengths of the Swiss R&D Funding/ Support System

- Optimal distribution of tasks between “tailor-made” federal agencies with important participation of experts from academia and industry
- Important R&D activities carried by private industry (in-house research and foundation-based research institutes).
- Optimal conditions for innovation and technology transfer  
--> private and federal support
- Very significant activities in founding new companies (Start-ups and Spin-offs)
- Active private investors and VC companies/funds
- R&D in Switzerland is “multi- and transcultural” ( $\geq 50\%$  of PhD-students and postdocs are of non-Swiss origin)
- Acces to multi- and international research programmes and institutions



# R&D Resources in Switzerland

- **Swiss Universities**
- **Swiss Federal Institutes of Technology**
- ▲ **Universities of Applied Sciences**
- ★ **Technology Parks**





# Scientific Citations

## Ranking : research fields 1998-2002

Rank	Engineering, Computing & Technology	Physical, Chemical & Earth sciences	Life Sciences	Agriculture, Biology & Environmental Sciences	Social & Behavioral Sciences
1	Switzerland	USA	USA	Holland	USA
2	USA	Switzerland	Switzerland	Denmark	Holland
3	Israel	Denmark	Holland	UK	UK
4	Denmark	Holland	UK	USA	Canada
5	Holland	Germany	Finlande	Sweden	Finlande
6	Australia	UK	Canada	Switzerland	Sweden
7	UK	Australia	Denmark	Australia	Norway
8	France	Canada	Sweden	France	Belgium
9	Japan	Israel	Germany	Canada	Italy
10	Sweden	Sweden	Belgium	New Zealand	New Zealand
11	Canada	France	New Zealand	Belgium	Australia
12	Germany	Austria	Ireland	Norway	Israel
13	Belgium	Japan	Australia	Finlande	Denmark
14	Italy	Belgium	Norway	Israel	France
15	Norway	New Zealand	France	Germany	Switzerland

# R&D Funding in Switzerland

## Basic Research

### Swiss National Science Foundation SNSF

- Humanities and Social Sciences
- Mathematics, Natural and Engineering Sciences
- Biology and Medicine

## Targeted Research Programmes

### Swiss National Science Foundation SNSF

- National Research Programmes NRP
- National Centres of Competence in Research NCCR

## Applied R&D Projects and Initiatives

### Swiss Innovation Promotion Agency CTI

- Life Sciences
- Enabling Technologies
- Micro- and Nanotechnologies
- Engineering Sciences

## Departmental R&D

- Energy Research
- Environmental Research
- Agricultural Research
- Human and Animal Health, etc.

## Private Foundations/Institutes



# R&D Funding in Switzerland

## Access to Multi- and International Research Programmes and Institutions

- EU - Framework Programmes 6 and in the future 7
  - EUREKA
  - COST (European Cooperation in Science and Technology)
  - CERN (European Centre of Nuclear Research)
  - ESA (European Space Agency)
  - EMBL (European Molecular Biology Laboratory)
  - HFSP (Human Frontier Science Program)
  - IEA (European Energy Agency)
  - IMS (Intelligent Manufacturing Systems)
  - EURATOM
- etc.



# Biotech R&D Support: National Key Agencies

The exciting and rapid development of Swiss Biotech during the past decade has been triggered by various public and private actors.

The main state funded biotech R&D and structural support came/comes from:

• **Swiss National Science Foundation SNSF**



and

• **Swiss Agency for Innovation Promotion**



Both federal agencies, **SNSF** and **CTI** follow in a complementary way a mixed strategy comprising the main elements of:

- Support for basic and oriented research (SNSF)
- Support for applied research and development (CTI)
- Scientific networking and improvement of biotech support infrastructure
- Facilitation of innovation and technology transfer
- Creation of spin-offs and start-ups.



**Swiss National Science Foundation**  
**FNSNF**

**Swiss Innovation Promotion Agency**  
**KTI/CTI**

Funding of Basic Research (100%)  
Program Research: NRP, SPP, NCCR

Funding of Applied Research\*  
Special Initiatives\*  
Start-up Support

**UNIVERSITIES, FEDERAL INSTITUTES OF TECHNOLOGY, EMPA, EAWAG, etc.**  
(UNIVERSITIES OF APPLIED SCIENCES)

**UNIVERSITIES FEDERAL INSTITUTES OF TECHNOLOGY**  
**UNIVERSITIES OF APPLIED SCIENCES**

Crossover  
Innovative new "Technology"

Technology Transfer

**INDUSTRY**  
SME and Large Companies

Technology Transfer  
\*50% Co-funding

**Funding: Research and Innovation**



# Biotech Support by SNSF: The Swiss Priority Programme Biotechnology (1992-2001)

## Modules of SPP BioTech (Projects 1992-1996/1996-1999/2000-2001)

- Processes for the Production and Purification of Proteins for Medical Applications (7/7/2)
- Biotechnology: Bioengineering and Biocatalysis (14/19/9)
- Food Biotechnology (0/9/4)
- Bioelectronics and Neuro-Informatics (10/13/2)
- Biosafety Research and Development of Biotechnology (17/18/8)
- Biotechnology of Higher Plants (22/18/8)
- Education and Continuing Education in Biotechnology (37/14/0)  
-----> PhD-students, Postdocs, Sabbaticals, Junior Group Leaders

3 Agencies created in Support of Swiss Biotech (Information/Communication, Biosafety/Technology Assessment, Technology Transfer)

# SPP BioTech Statistical Data (1992-2001)

## Technology Transfer - SPP BioTech Achievements

- Funded persons (868) → PhD students, postdocs, non-graduates
- Patents/Licences (>70)
- Processes/Products (>100)
- Publications (>1500)
- 18 Spin-off companies (e.g. Cytos, Prionics); > 400 new workplaces
- >100 Companies (mainly SME) were involved in SPP Biotech as transfer partners
- Financial aspects: Federal contribution: approx. 100 Mio CHF  
Third party contributions: approx. 56 Mio CHF  
Mobilised Venture Capital until 2004: >100 Mio CHF

# SPP- BioTech Spin-off Companies (origin)

- Cistronics Cell Technologies GmbH, Zürich (ETHZ/SPPB)
- Cytion SA (formerly TransSense), Epalinges (EPFL/SPPB)  
(→ now MOLECULAR DEVICES)
- Cytos Biotechnology AG, Schlieren (ETHZ/SPPB)
- Diagnoswiss SA, Monthey (EPFL/SPPB)
- EcoStrat GmbH, Zürich (FAL/SPPB)
- ExcellGene SA, Gland (EPFL/SPPB)
- GlycArt Biotechnology GmbH, Zürich (→ now ROCHE) (ETHZ/SPPB)
- Gnothis SA, Lausanne (EPFL/SPPB)
- Lunamed AG, Basel/Zürich (ETHZ/SPPB)
- MADEP SA, Bevaix (UniNE/SPPB)
- Metabolic Concepts GmbH, Zürich (ETHZ/SPPB)
- PolyTag SA, Lausanne (EPFL/SPPB)
- Prionics AG, Zürich (UniZH/SPPB)
- Sciartec GmbH, Zürich (UniZH-ETHZ/SPPB)
- Selexis SA, Lausanne (EPFL-UNIL/SPPB)
- Tenaxis AG, Zürich (not operative) (ETHZ/SPPB)
- Unitectra AG\*, Zürich, Bern (SPPB/UniZH/UniBE)
- Zeptosens AG, Witterswil (→ now BAYER) (Novartis/SPPB)



## Life Science Support: NCCR (SNSF)

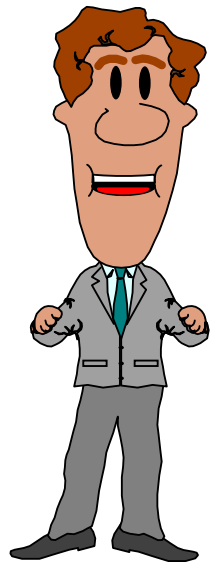
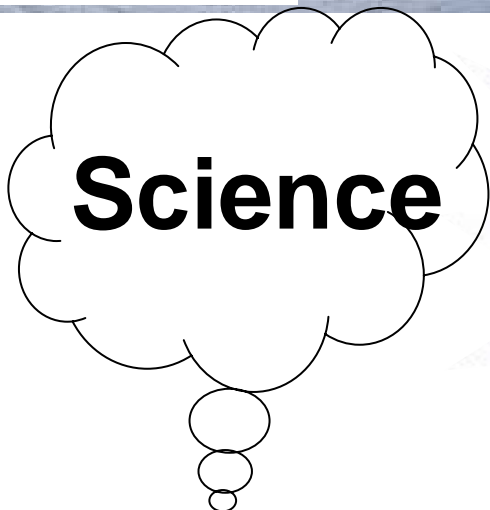
Since 2001, **seven National Centers of Competence in Research NCCR** of the Swiss National Science Foundation support targeted research in Life Sciences (including Biotech and Medtech) and related topics:

- **Molecular Oncology** – From Basic Research to Therapeutic Approaches
- **Frontiers in Genetics** – Genes, Chromosomes and Development
- **Molecular Life Sciences** – Three Dimensional Structure, Folding and Interactions
- **Neural Plasticity and Repair**
- **Plant Survival in Natural and Agricultural Ecosystems**
- **Nanoscale Science** – Impact on Life Sciences, Sustainability, ICT
- **Computer Aided and Image Guided Medical Interventions**

In addition: various smaller **National Research Programmes.**

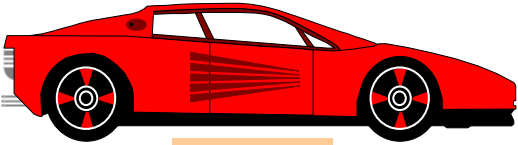
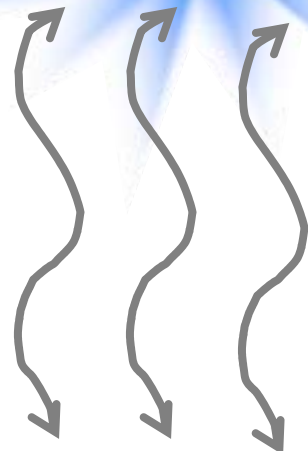
**KTI/CTI**

**Science to Market**



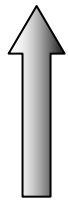
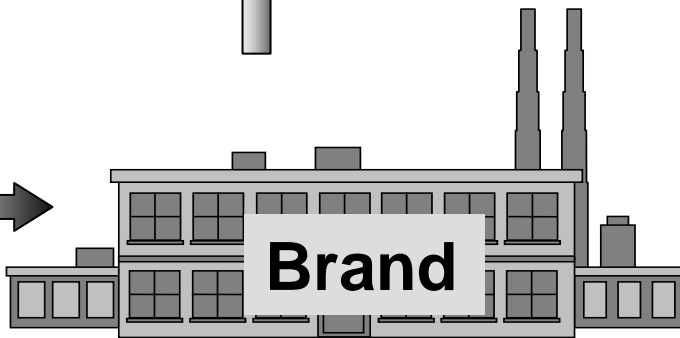
**Politics**

**Public Economy**



**CTI**

**Innovation process**



## **CTI Areas of Promotion and Promotion Campaigns**

### **Funding Areas**

**CTI Life  
Sciences**

**CTI Biotech**

**CTI Medtech**

**CTI Enabling  
Sciences**

**CTI Nano-  
and Micro-  
Technologies**

**CTI Engineering  
Sciences**

### **Transdisciplinary Promotion Campaigns**

**CTI Start-up**

**CTI Innovation and Successful Ageing**

**CTI Universities of Applied Sciences**

**CTI International**

**CTI Knowledge and Technology Transfer**



**KTI/CTI**

# 4 Keys to Success for High-Tech Companies

Governmental  
Support

**KTI/CTI**

**Project Funding**

**CTI START-UP**



**aR&D**

**Coaching**

**Training**

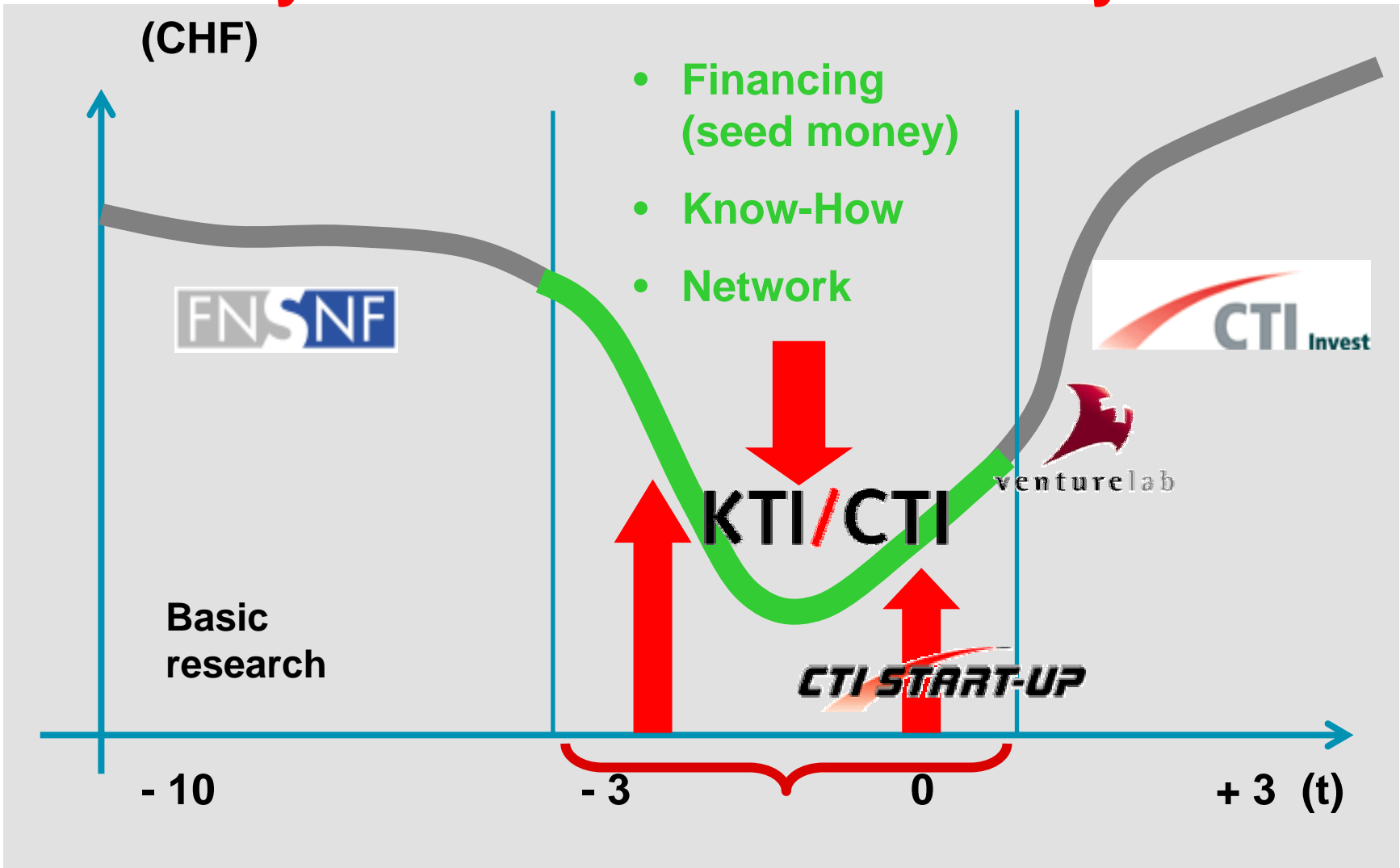
Private Support

The logo for CTI Invest, featuring a red swoosh above the text "CTI Invest" in a bold, sans-serif font.

**Financing / Alumni**

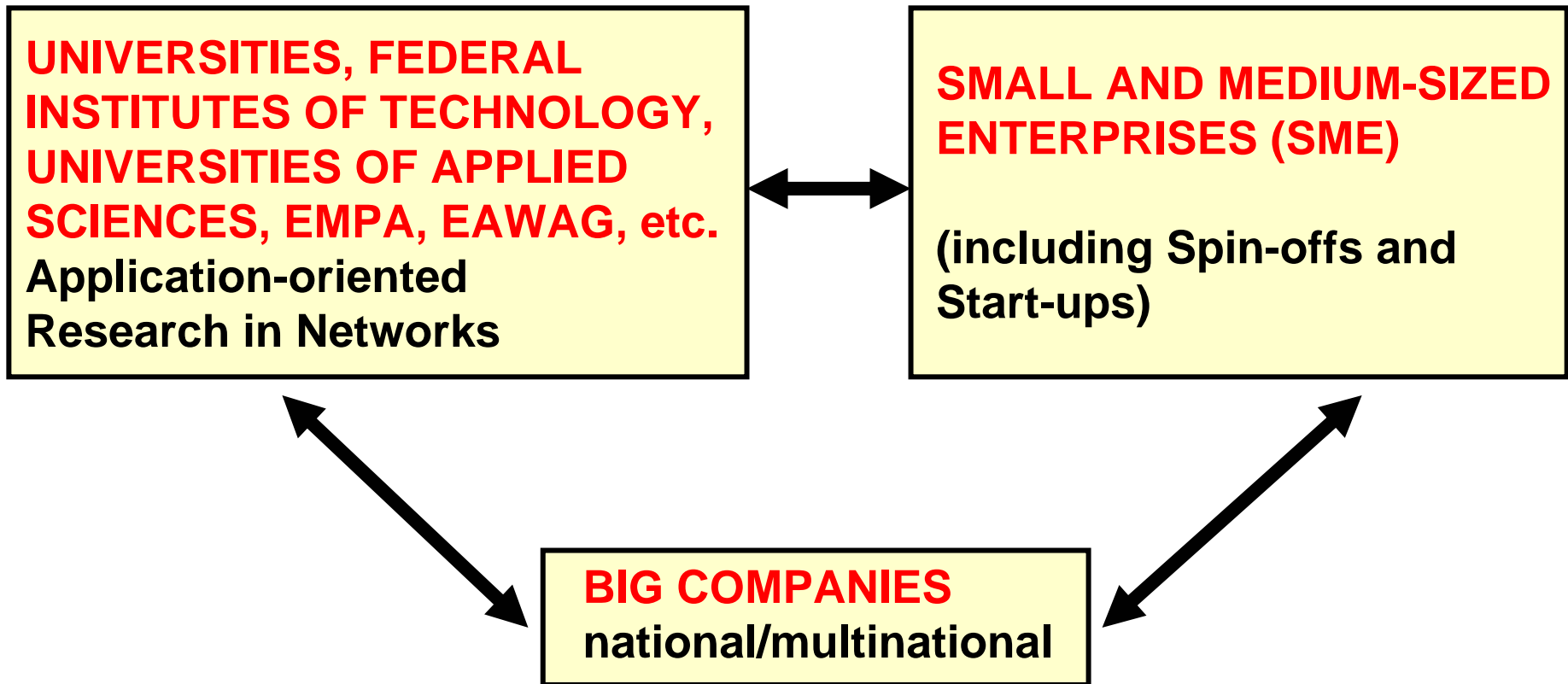
# KTI/CTI

## Growth by Innovation and The Valley of Death





# Knowledge and Technology Transfer



**TECHNOLOGY TRANSFER AND RESEARCH ALLIANCES**

**Ideal Situation (CTI Strategy) : Push-Pull System**



**KTI/CTI**

**The First Key to Success**

**KTI/CTI**

**Money for applied R&D  
CTI Projects**

[www.kti-cti.ch](http://www.kti-cti.ch)

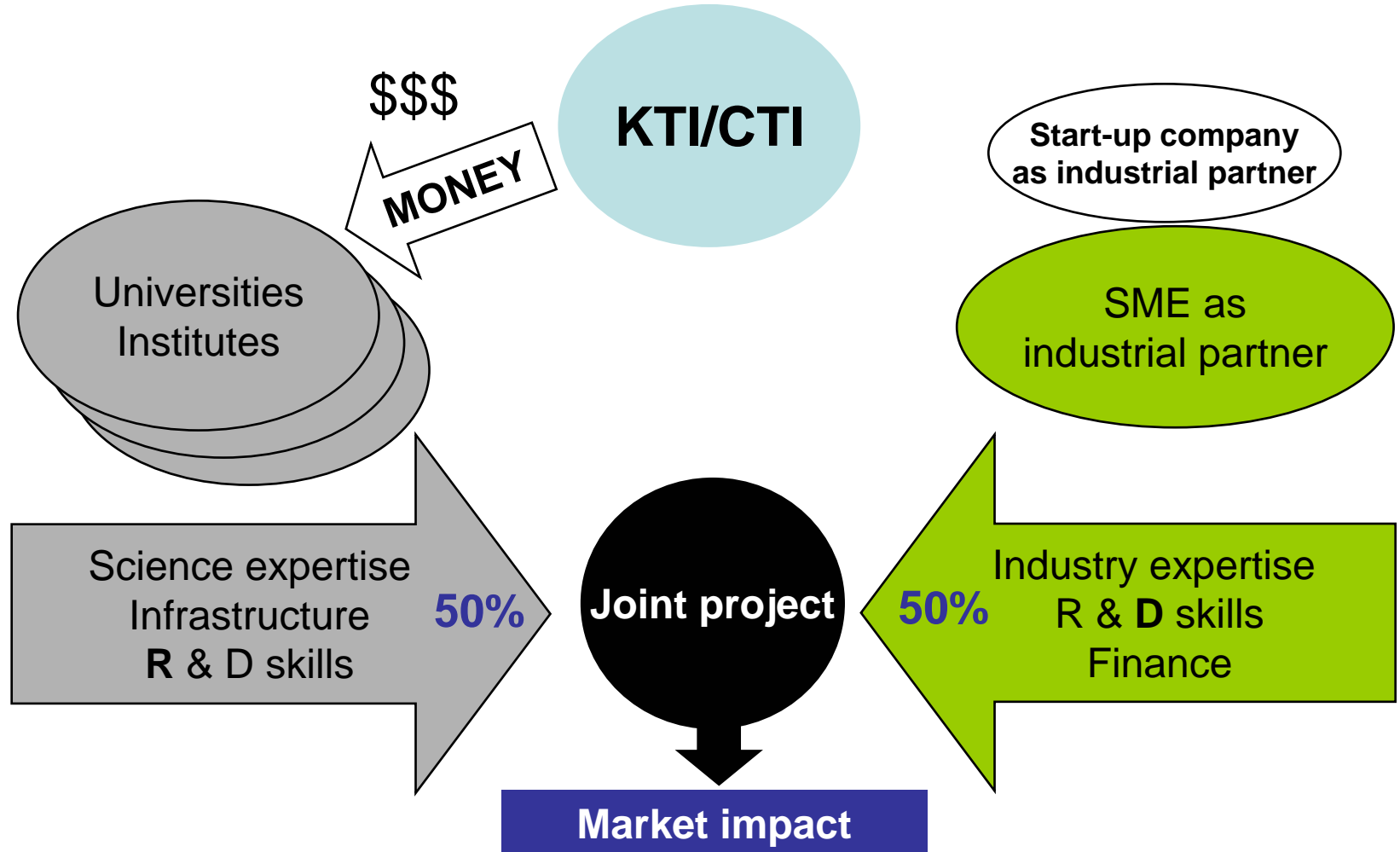
## **CTI-Supported R&D Projects Include:**

- R&D collaborations involving academic groups\* and established companies (SMEs and big companies)
- R&D collaborations involving UAS-groups\*\* and companies
- R&D consortia involving academic groups, UAS-groups and companies
- R&D projects involving Biotech Startups and partners from academia and/or UAS.
- Funding is bottom-up, i.e. project partners define the projects.
- New: Discovery Projects

\*) Universities, Federal Institutes of Technology, EAWAG, CSEM

\*\*\*) UAS = Universities of Applied Sciences

## Financial Support for aR&D



## CTI Project Funding Activity

<b>Key Figures</b>	<b>2003</b>	<b>2004</b>
Number of project applications	700	600
aR&D projects accepted (80% with SMEs)	400	226
Total volume in Mio. CHF	100	82
Average volume of one project in Mio. CHF	0.25	0.36
Project money by industrial partners in Mio. CHF (50/50 Rule)	130	106

**LEVERAGE !**



**KTI/CTI**

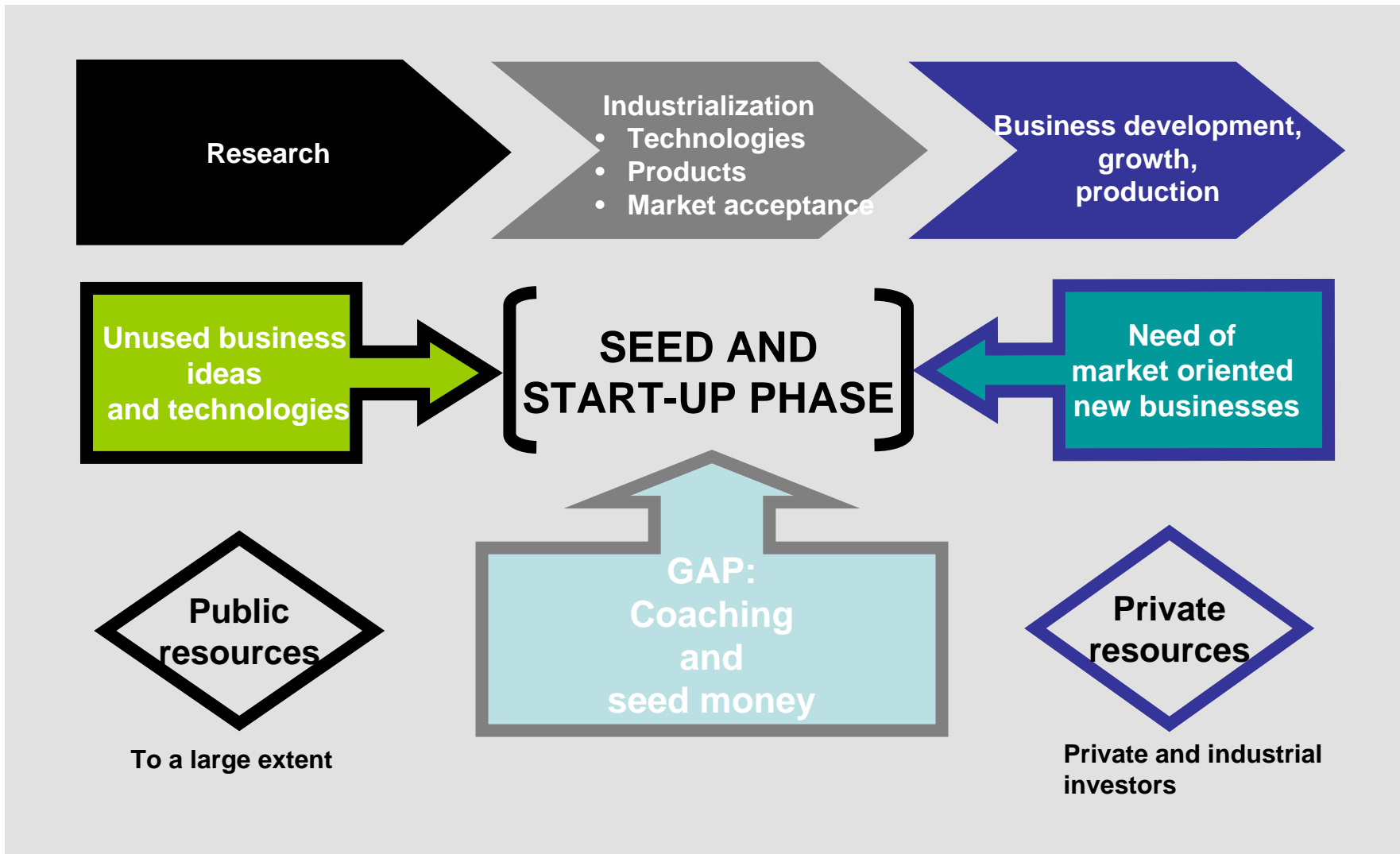
## **The Second Key to Success**



**Professional Coaching**

[www.ctistartup.ch](http://www.ctistartup.ch)

# The Market



## **CTI Start-up**

Average 160 hours

### **Goals of Coaching**

- Determine the market focus
- Help build a sound/scalable business model & strategy
- Business/industry knowledge transfer to founding team
- Help build a team and board
- Help establish a financial plan
- Help develop a IPR strategy
- Help develop a professional business plan

### **▪ Get the CTI Start-up label**

- Help get funding/financing



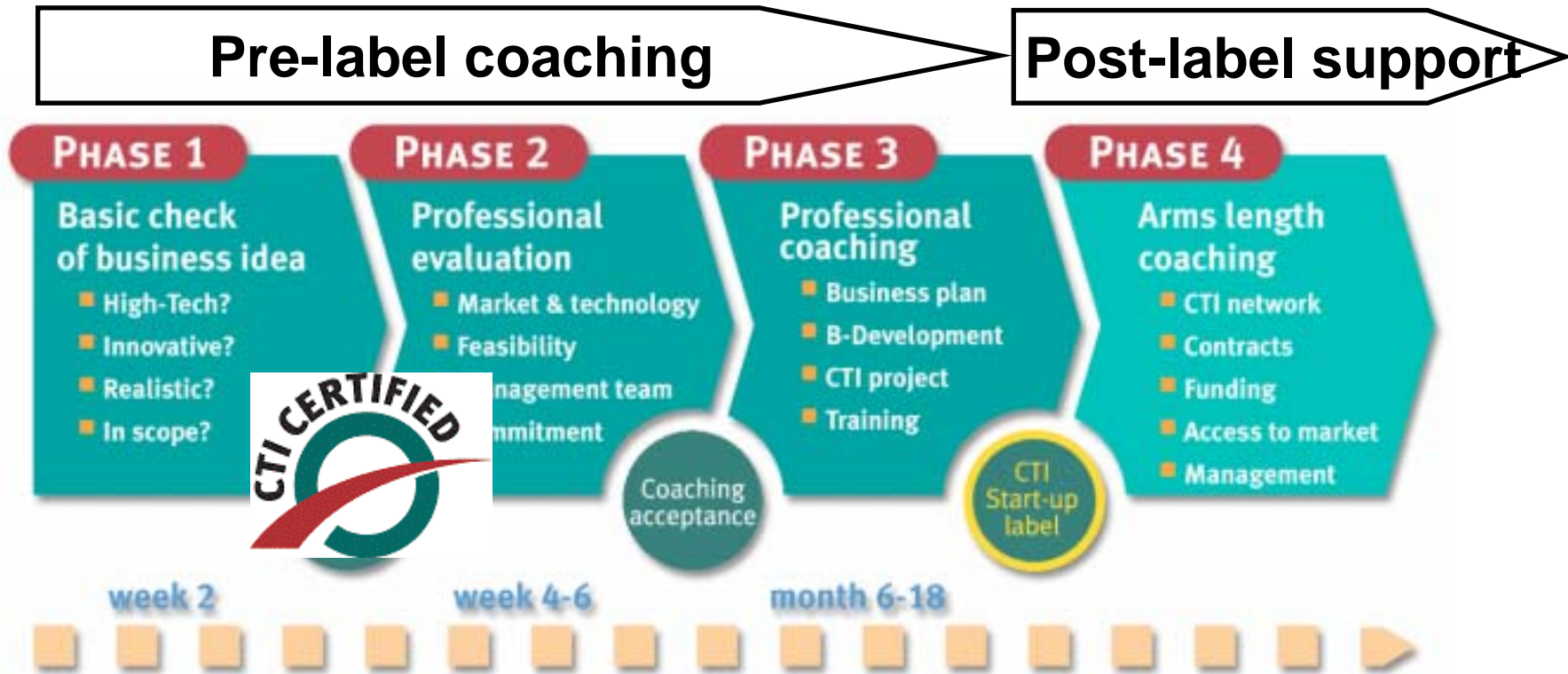


## The CTI Start-up Label



- **Target** of the CTI Start-up label:  
Qualify the start up company as being **ready for venture financing**, or as having reached the **basis for a sustainable growth**
- **Requirements** to get the CTI Start-up label:
  - The basic qualification for venture financing or sustainable growth is reached, when:
    - Sound business model & strategy
    - Management team (expertise, skills) in place or identified
    - Market analysis, market access and acceptance
    - IPR and financial assessment
    - Growth potential

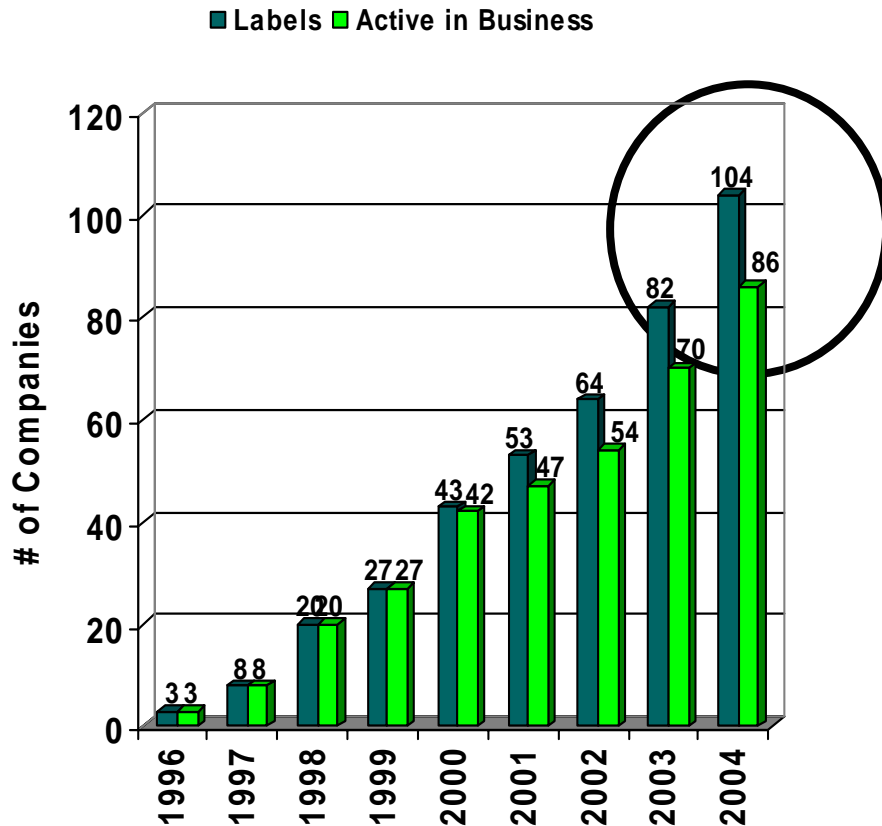
# The Professional Coaching Process



**Approx. 130 cases in the pre-label coaching process with 35 coaches**

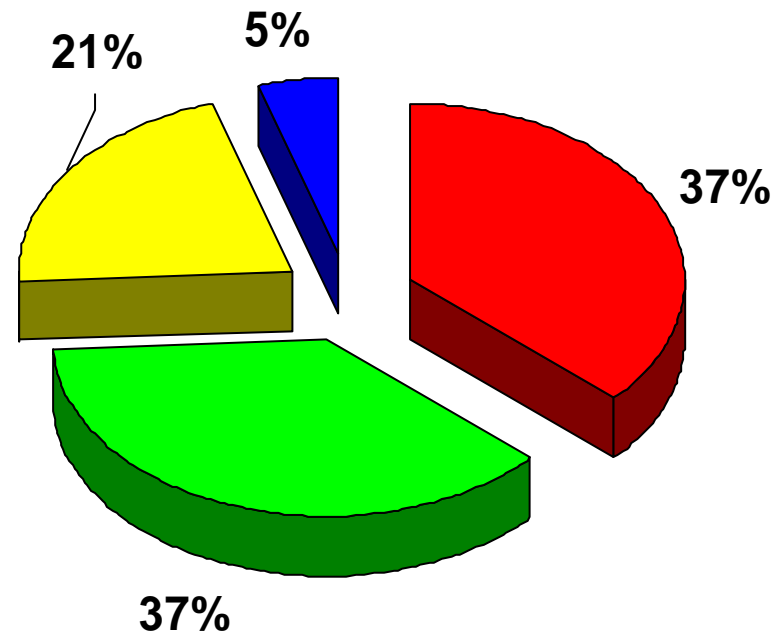
## Portfolio of CTI Start-up Label Companies > 100 Labels

### Growth of Portfolio



### Industry Sectors

- Information / Communication
- Biotech / Lifesciences
- Interdisciplinary
- Micro- / Nanotechnology



High success or survival rate!!



**KTI/CTI**

# The Third Key to Success



**Education and Training**

[www.venturelab.ch](http://www.venturelab.ch)

## Target Groups

**Create  
interest and  
overcome  
fear**

**Students and persons interested in start-ups  
(interest in entrepreneurship)**

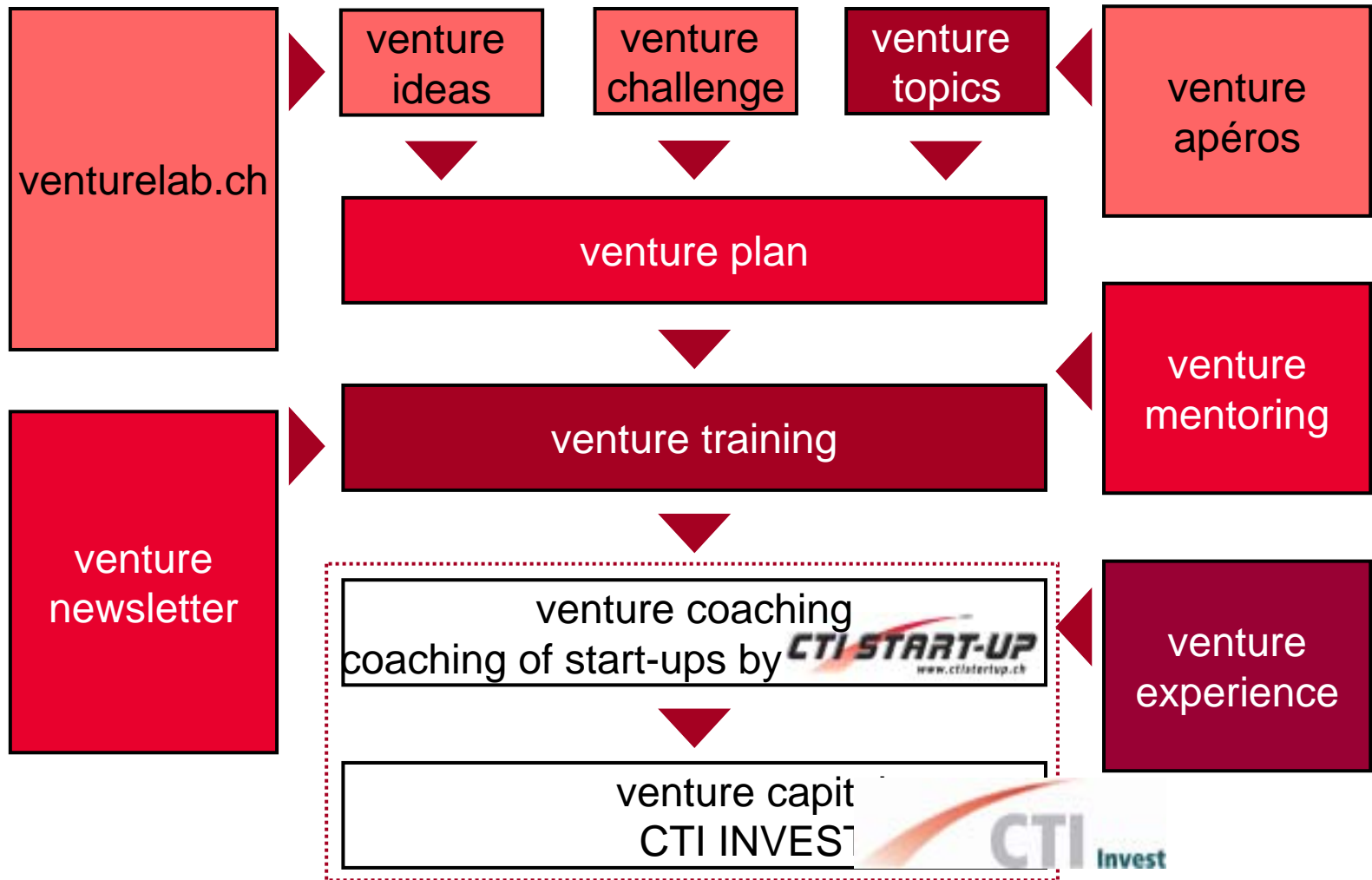
**Motivate and  
encourage**

**"Entrepreneurs to be"  
(students and potential young entrepreneurs  
with specific business ideas)**

**Actively  
supports**

**Start-ups  
(specific project and  
business plan exist)**

# Program at a Glance





**KTI/CTI**

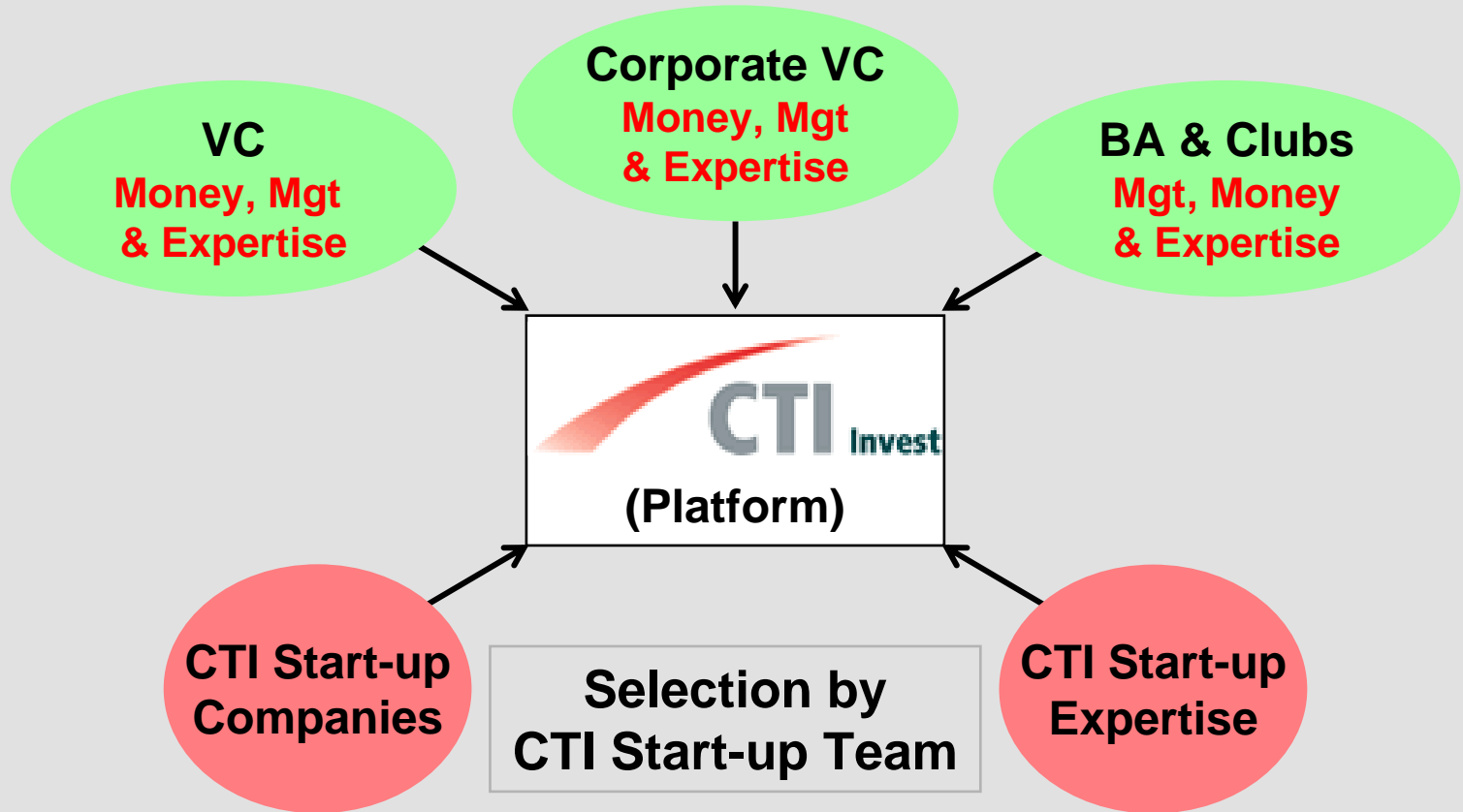
## **The Fourth Key to Success**



**Financing / Alumni**

[www.cti-invest.ch](http://www.cti-invest.ch)

## CTI Invest (Founded 6.5.2003)



Pre-selection „Sell Side“- Due Diligence

Coaches  
Specialists



## Achievements CTI Invest

	<b>2003</b>	<b>2004</b>	<b>2005</b>
Swiss Venture Days	3	4	1
<b>Presented companies</b>	16	15	4
<b>Financing volume in Mio.</b>	CHF 5	Approx. CHF 8	Approx. CHF 6
Total Members (investors)	19	22	33
- <b>Swiss Institutional</b>			<b>15</b>
- <b>Business Angels</b>			<b>11</b>
- <b>Foreign Institutional</b>			<b>4</b>
- <b>BA Clubs</b>			<b>3</b>

In addition: 40 CTI Start-up Label Companies have become Alumni Members.



## Summary of the 4 Keys to Success

1. **CTI Project** → Funding of applied R&D
2. **CTI Start-up** → Coaching support, Label
3. **venturelab** → Know-how, network
4. **CTI Invest** → Investors, CEO Day, CTI Label Alumni

# Specific Biotech Support by CTI

In 2003, **CTI** established a special support initiative **CTI Biotech** in order to further **enhance and improve the project and structural support for Swiss Biotech** and to **facilitate the economic valorization** of biotechnological processes and products in and for Switzerland.

**CTI** also supports via its sections **CTI Life Sciences and UAS** **application- and transfer-oriented biotechnology projects** and is actively involved in national networking, especially on the level of the Universities of Applied Sciences (National Competence Networks)

→ **Swiss BioteCHnet**  
[www.swissbiotechnet.ch](http://www.swissbiotechnet.ch)

→ **Swiss Food Net**  
[www.swissfoodnet.ch](http://www.swissfoodnet.ch)

## Biotech Support by CTI

In addition to **CTI Life Sciences and CTI Biotech** the following other CTI sections and initiatives contribute to the development of biotechnology in Switzerland:

- **CTI Medtech** (*supports e.g. tissue engineering for implants, biocompatible materials, bioanalytical devices*)
- **CTI Nanotechnology / Microsystems Technology** (*e.g. biochips, ultrasensitive bioanalytics, nanoparticles for biological and medical applications*)
- **CTI Start-up** (*support for the creation of start-ups by active coaching and provides the CTI Start-up Label to the most promising companies → so far > 30 Life Science Start-ups supported*).

## **Biotech/Life Science Companies with CTI Start-up Label (selection)**

**4-Antibody AG**

**Arbomedics GmbH**

**Athelas SA**

**Bitplane AG**

**CellnTec Advanced Cell Systems AG**

**Cistrionics Cell Technology AG**

**Cytion SA → Molecular Devices**

**Concentris GmbH**

**Covalys Biosciences AG**

**DNAsign AG**

**Dualsystems Biotech AG**

**ESBATech AG**

**Extractis Switzerland SA**

**Frimorpho AG**

**Glycart Biotechnology AG → Roche**

**Gnothis AG**

**Herbonis AG**

**Hocoma AG**

**Lipideon Biotechnology AG**

**MyoContract → Santhera AG**

**PolyGene SA**

**Selexis SA**

**The Genetics Company AG**

**TheraStrat AG**

## **Swiss Biotech Association SBA (130 member companies) an Important Collaboration Partner for CTI**

The SBA intends to secure the position to which biotechnology SMEs will be entitled now and in future. Focus is on:

- Support to create the conditions in biotechnology appropriate for SMEs.
- Continue the awareness programme to reduce the fear connected with modern biotechnology
- Intensify research-related communication between universities and the biotech industry
- Promotion of the opportunities attached to professional careers in science and biotechnology sector
- **Integration of the Swiss Biotech Industry on the national level, on European level and on the global level.**



# Biotech – Networking in Switzerland

## Support actions coordinated by seco (selection)

- Location: Switzerland - Status brochure „Biotechnology in Switzerland“ (updated edition 2003, also available in Japanese)
- Jointly with SBA: Creation of a „**Swiss Life Sciences Database**“ as a follow-up of the “Swiss Biotechnology Industry Guide” (Unitectra 2001) → > 700 entries so far, free access → [www.swisslifesciences.com](http://www.swisslifesciences.com)

Contributors/sponsors: BioAlps, Biovalley Basel, BioteCHnet, Greater Zurich Area, SWX, seco, and Venture Valuation

- Establishment of a Swiss Biotech Internet Platform under the label „**Swiss Biotech**“ --> [www.swissbiotech.org](http://www.swissbiotech.org)

Working group: seco, SBA, CTI, BATS, Basel Area, SWX, UAS, Unitectra, Prionics, Nextage etc.



## **(Bio)Technology Transfer by Swiss Universities**

- In the past eight or ten years Swiss universities (with the help of SPP Biotech, CTI and others) have facilitated the creation of more than 45 new biotech companies (such as Prionics, Cytos, ESBATech, Isotis and Geneprot)
  - For comparison: In the last four years in total ~ 55 new biotech companies were created in Switzerland.
- This shows that the Swiss Universities indeed play an important role in both the innovation process and in the expansion of the Swiss Bioindustry.

More information:

[www.unitectra.ch](http://www.unitectra.ch)

[www.spinoff.ch](http://www.spinoff.ch)

[www.ey.com/ch/biotech](http://www.ey.com/ch/biotech)

[www.swissbiotechassociation.ch](http://www.swissbiotechassociation.ch)



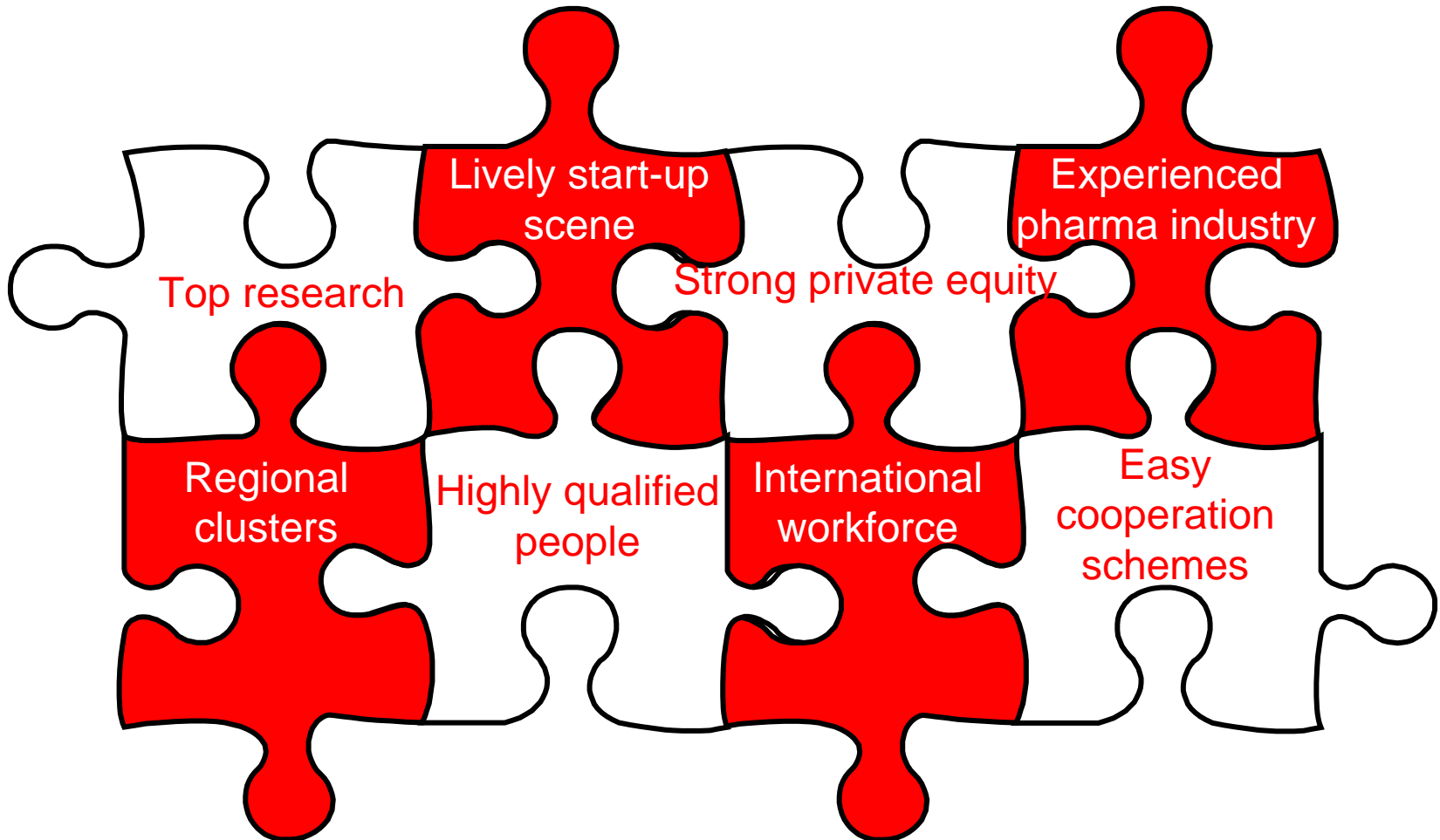
[www.swiTT.ch](http://www.swiTT.ch)

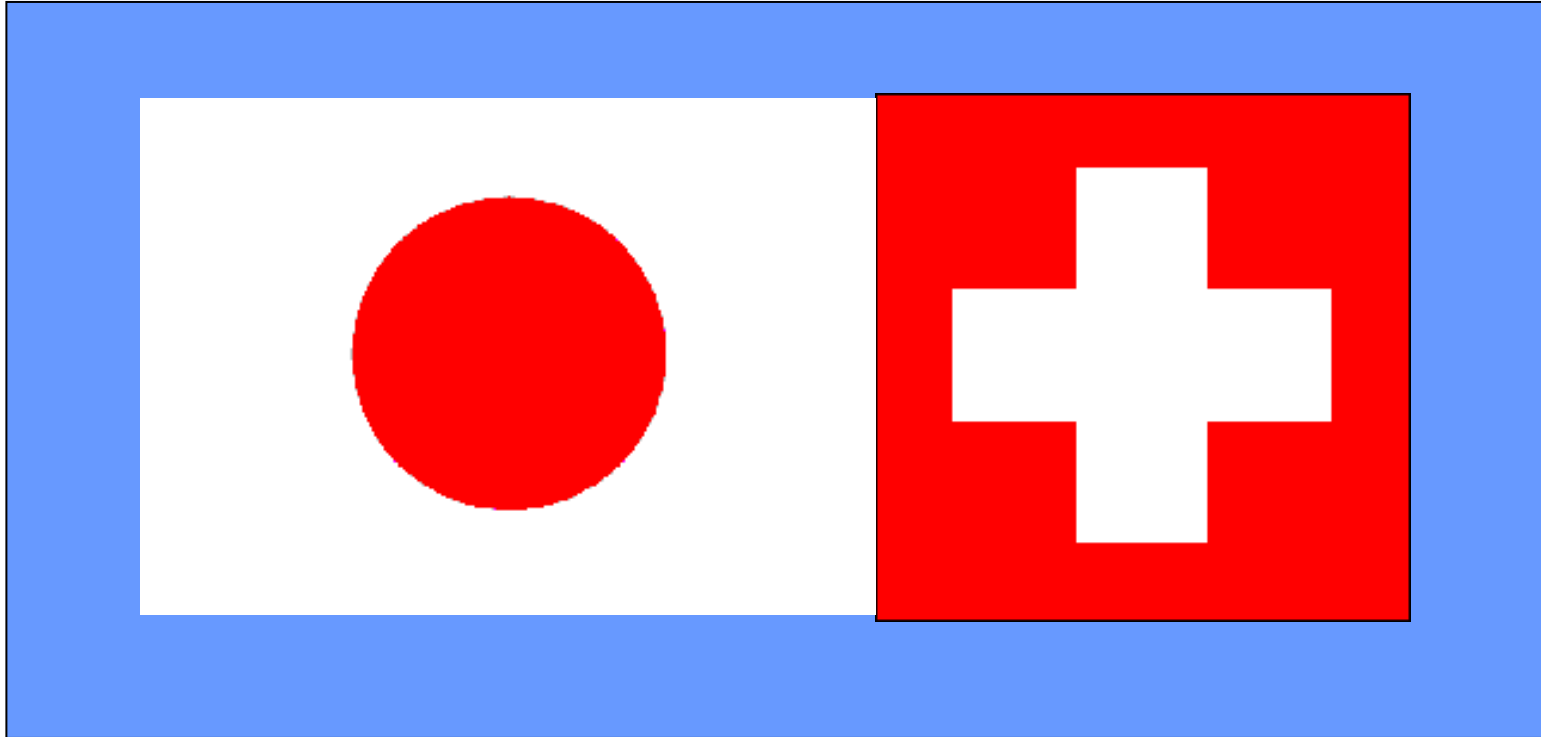


# Biotech Structural Aspects to be Further Improved (list compiled by CTI Biotech and SBA)

- Seed financing for Start-ups
- R&D research consortia with SMEs
- Development of joint technology platforms for SMEs
- Environmental aspects
- Intellectual property and documentation
- Biosafety (regulations, training, practical implications)
- **GLP und GMP (training and manufacturing)**
- Certification and accreditation
- **Organisation and financing of clinical tests**
- Affordable access to data (scientific, patents, marketing)
  - > specifically data mining for genomics, proteomics etc.
- **Facilitated access to scientific journals (electronic databanks)**
- Communication and political dialogue

## Swiss Life Science Assets (Summary)





## **CTI International** **International Access**

CTI International facilitates access to international programs such as **EUREKA**, **IMS**, and in a limited capacity, to the **EU Framework Program**.

In addition, CTI International offers a fully operational platform for collaboration with the **P.R. China**.

This includes CTI ground staff in China.

**A dedicated cooperation with Japan is envisaged.**

**Further Asian countries could follow.**





# Japanese-Swiss Biotech Interactions

The intensification of biotech relations and exchange between Switzerland and Japan is a very important issue.

## Level of Industrial and Economic Cooperation and Technology Transfer/Exchange

Instruments/options to be further improved/extended are:

- **Relations between Japan Bioindustry Association (JBA) and Swiss Biotech Association (SBA)**
  - Memorandum of Understanding will be signed on September 6th 2005 at the Swiss Embassy in Tokyo.
- **Facilitated business contacts** via Japanese Swiss Chambers of Commerce, Business Hubs, Economy Counselors at the Embassies



# Japanese-Swiss Biotech Interactions (2)

## Level of Science and Technology

- **Japanese-Swiss Joint Meetings on Biotechnology and Bioprocess Development (held every two years)**
  - participants from academia and industry
  - 9th Swiss-Japanese Meeting: Sept.12-15, 2004 in Mürren (CH)
  - 10th Japanese-Swiss Meeting: Sept. 25-27 2006 in Kanazawa (J)  
Organisers: Sakayu Shimizu, Hidehiko Kumagai, Hideaki Yamada (J)  
Oreste Ghisalpa, Hans Leuenberger (CH)
  - Typical spin-offs: new contacts, scientific and technological collaborations, technology transfer
- **Facilitated scientific and technological contacts** via the Science and Technology Counselors at the Embassies
- **Inclusion/embedding of Japanese partners in EUREKA, EU, CTI International projects**



**KTI/CTI**

**THANK YOU FOR YOUR  
ATTENTION**

## **CTI Biotech Success Stories**

### ***Examples (Documentations available):***

- **Progress in the Fight Against Malaria (Virosome Vaccine)**  
(Partners: Pevion Biotech AG, Swiss Tropical Institute, University of Zurich)
- **Tissue Engineering – Tissue from the Test-Tube (Cartilage)**  
(Partners: Sulzer Medica AG /Zimmer Ltd., UAS Winterthur, UAS Biel, UAS Burgdorf)
- **A Thumbnail–sized Analytical Lab (Lab on a Chip)**  
(Partners: DiagnoSwiss SA, Swiss Federal Institute of Technology Lausanne)
- **Revolutionary Technology in Protein Research (SNAP-tag)**  
(Partners: Covalys AG, Swiss Federal Institute of Technology Lausanne)



## **CTI Biotech Success Stories**

### ***Examples (Documentations available):***

- **Brewer's Yeast Shows the Way to New Drugs (DUAL Hybrid Technology)**  
(Partners: Dualsystems Biotech AG, University of Zurich)
- **New Strategies to Fight Neuromuscular Disorders (Drugs Against Muscular Dystrophy)**  
(Partners: MyoContract AG, University of Basel)
- **The Disposable Wave Bioreactor – A Lullaby for Cell Cultures**  
(Wave Biotech AG, Laves AG, Cytos Biotechnology AG, UAS Wädenswil and Burgdorf, University Hospital Zurich)

