

Catalyseurs de la région de santé *Katalysatoren der Gesundheitsregion*

Première plateforme santé Région capitale suisse
Erste Plattform Gesundheit Hauptstadtregion Schweiz



Salutations

Begrüßung

Beat Vonlanthen

Conseiller d'Etat du Canton de Fribourg, co-président Région capitale suisse

Staatsrat Kanton Freiburg, Co-Präsident Hauptstadtregion Schweiz

Schlüsselthemen

Thématiques clés

- > Politzentrum
 - > Gesundheitsstandort
Hauptstadtregion
 - > Smart Capital Region
 - > Cluster Food & Nutrition
 - > Grenzüberschreitende
Wirtschafts- und
Raumentwicklung
 - > Verkehr
 - > Zweisprachigkeit
 - > Centre politique
 - > Pôle de santé Région capitale
suisse
 - > Smart Capital Region
 - > Cluster Food & Nutrition
 - > Développement économique
et territorial intercantonal
 - > Transports
 - > Bilinguisme
-

Gesundheitsstandort Hauptstadtregion ***pôle de santé Région Capitale Suisse***



Gesundheitsstandort Hauptstadtregion

Pôle de santé Région capitale suisse

Réseau hospitalier de la Région capitale suisse

- > Collaboration médicale (p. ex. stroke units)
- > Coopération dans le domaine de la recherche (p. ex. études cliniques)
- > Cybersanté
- > Administration et logistique

Renforcement de l'industrie de la santé (techniques médicales, industrie pharmaceutique, biotechnologies)

- > Formation dans le domaine de la pharma
- > Coopération avec le Medical Cluster et la Biofactory Competence Center

Mise en évidence des projets phares

- > Sitem-insel AG, Swiss Integrative Center for Human Health, centre de santé de Berthoud, campus de Sion, CSEM, etc.
 - > Plateforme pour les acteurs
-

Plateforme santé *Plattform Gesundheit*



Coorganisateur
Co-Organisator

SICHH

Swiss Integrative Center for Human Health
A Unique Competence Center in the Heart of Switzerland

Sponsoring



MiCRONARC

Micro-nanotech Cluster of Western Switzerland

> **Buts de la plateforme**

Ziele der Plattform

- > Présenter les projets phares
 - > Profiter des synergies
 - > Soutenir les échanges entre les acteurs et favoriser la création d'un réseau
 - > Rendre visible et promouvoir les potentiels de la Région capitale suisse
-
- > Leuchtturmprojekte vorstellen
 - > Synergien nutzen
 - > Austausch der Akteure und Netzwerk aufbauen
 - > Potenziale der Hauptstadtregion sichtbar machen und fördern
-

Perspectives

Ausblick

- > L'industrie de la santé en tant que point fort 2016
 - > Organisation de 2 – 3 plateformes
 - > Forum Région capitale suisse du **18 novembre 2016** à Soleure

 - > Gesundheitsindustrie als Schwerpunktthema 2016
 - > Organisation von 2 – 3 weiteren Plattformen
 - > Forum Hauptstadtregion vom **18. November 2016** in Solothurn
-



Swiss Integrative Center for Human Health
A Unique Competence Center in the Heart of Switzerland

Innovation by Integration

Brunner Jean-Marc, PhD
CEO

Swiss Integrative Center for Human Health
SICHH SA

jean-marc.brunner@sichh.ch



Vision & Mission



- **SICHH vision:** create an **innovative environment to catalyze public and private ideas and projects** into breakthrough products
- **SICHH mission:** provide services of **academic excellence** combined with **industrial execution** for **R&D projects**

- **Supported by:**



SICHH Academic Partners

Academic Partners



In discussion

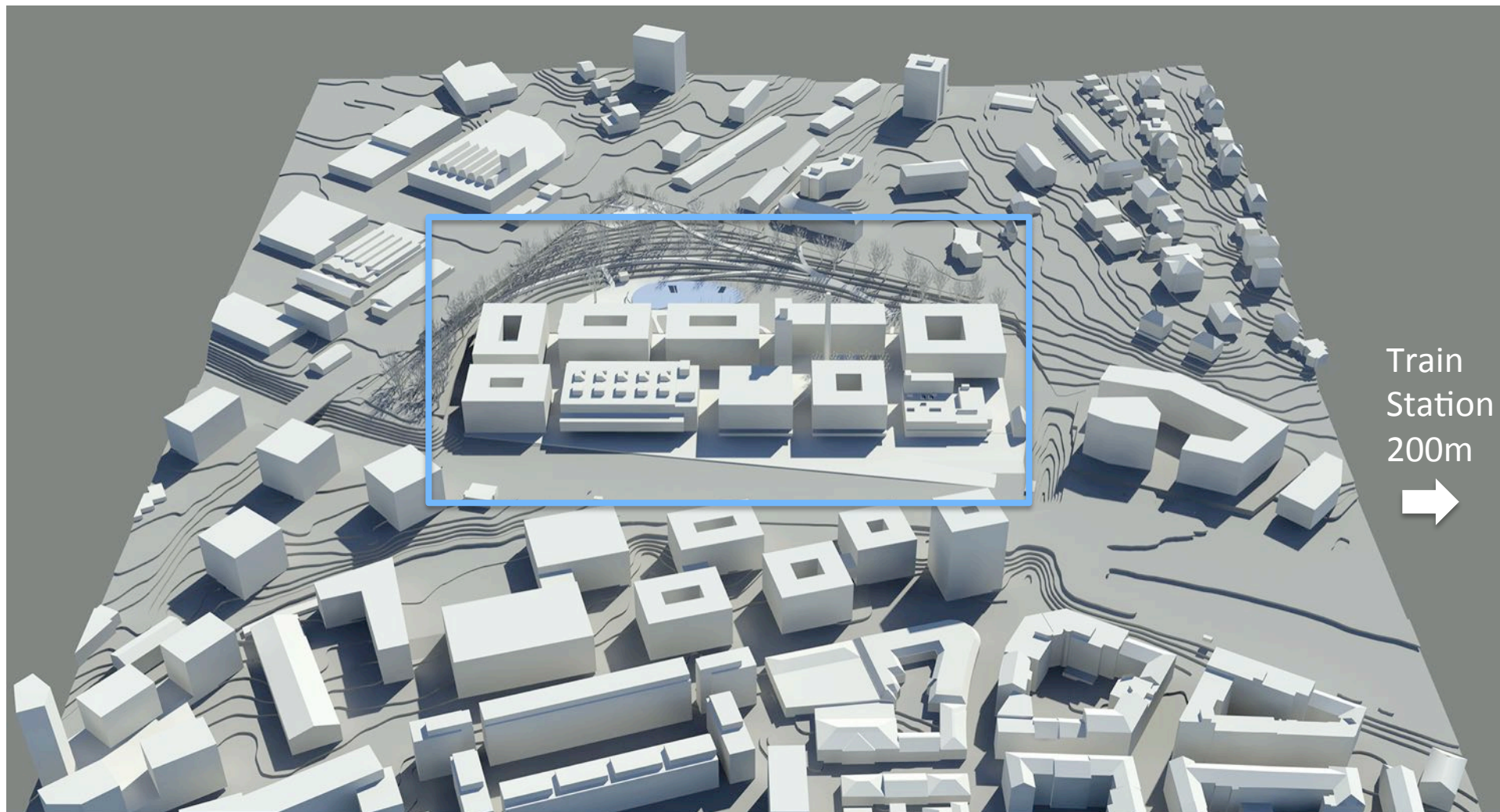


2016



- Access to Core Facilities (new Technologies and Competences)
- Access to SICHH industrial R&D project
- Academic Technology and Competence Promotion
- Complex Projects Management (PMC)

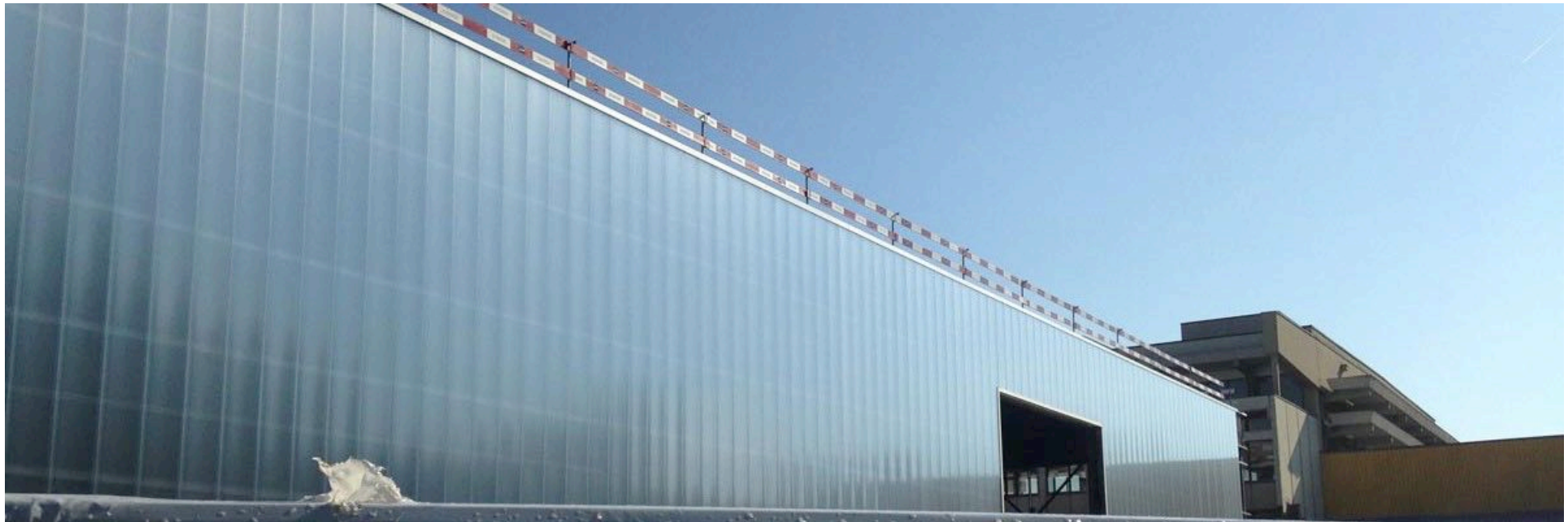
Location: Fribourg, quartier d'innovation BlueFACTORY



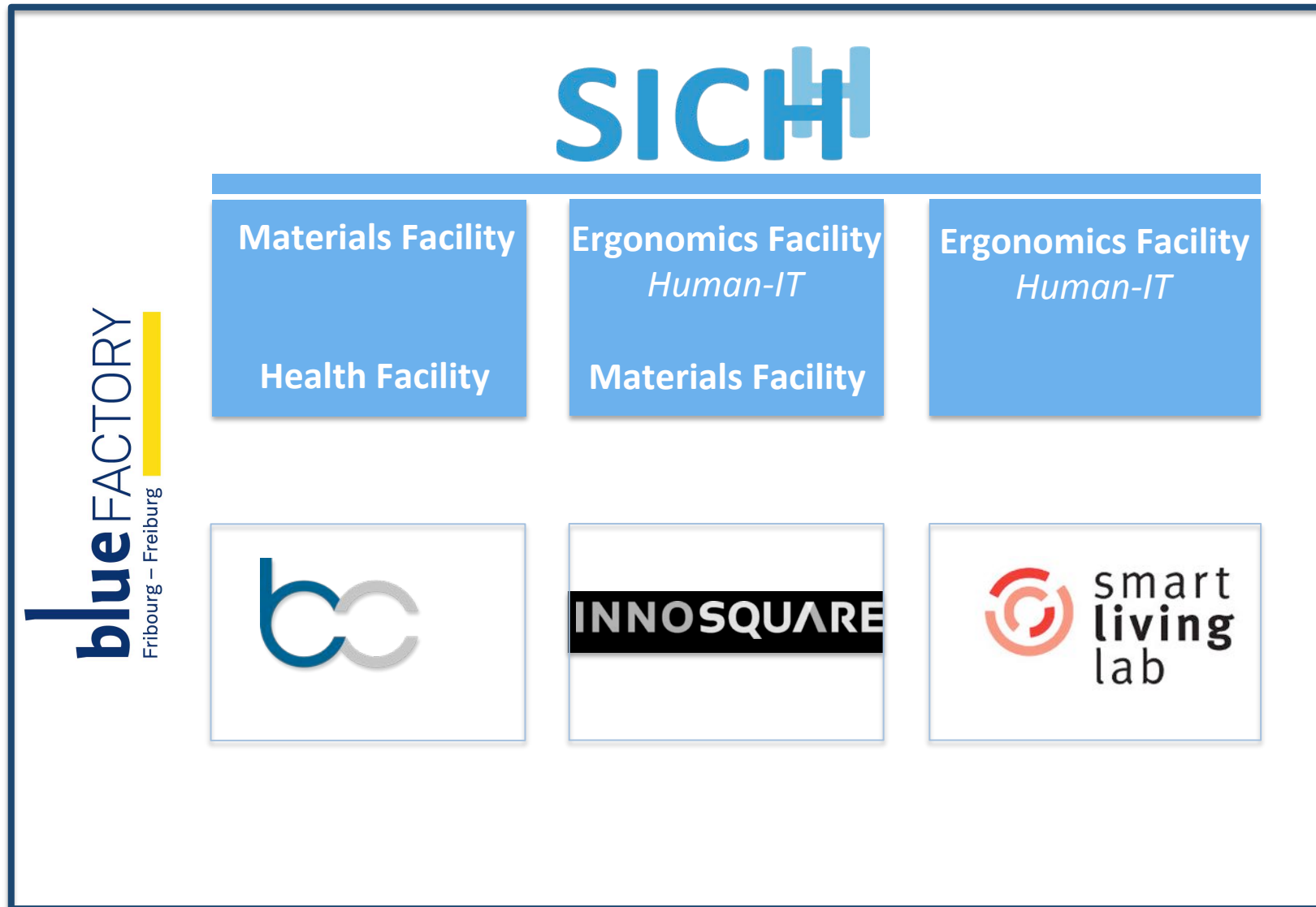
Location: Fribourg, quartier d'innovation BlueFACTORY



Location: Fribourg, quartier d'innovation BlueFACTORY



BlueFACTORY ecosystem



SICHI *Board of Directors*



Prof. Astrid Epiney
President



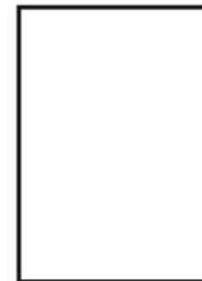
Prof. Rolf Ingold
Vice-President



Dr. Jean-Marc Brunner
Member / Secretary



Joël Savary
Member



Barbara Vauthey
Member



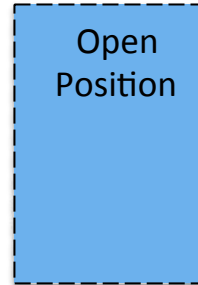
Dr. Jean-Marc Brunner
CEO



Dr. Michel Kropf
Business Development Senior Project Manager



Dr. Jan Kerschgens



Legal Counsel



Alexandra vonSiebenthal
Head Events



Dr. Mabel Maucci
Project Manager



Anais Dufaux
Accountant / HR



Public Relations



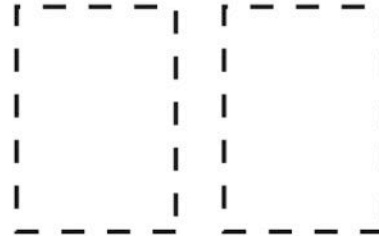
SICHI Collaboratory

H



Dr. Frédéric Guerry
Head Health

Open
Position



E



Dr. Geneviève Joullié
Head Ergonomic

Open
Position



M

Open
Position

Head Material



Dr. Mark Ambühl
Material Specialist



Dr. Alessandra Apicella
Material Specialist



A

Open
Position

Head Arithmetic



Tech Facility



Muriel Jaquet
Head Tech

Open
Position

IT-Support



Informatician

Structure SICHH SA

SICHH *Forum*

- Unique Entry Door
- Synergy Booster & «Think Tank »
- Open to the public & SICHH Promotion

SICHH *PMC*

Project Management Center

- G&A and Finance
- Coordination of the R&D projects and the Collaboratory
- Business development and IP
- Audits and Continuing Education

SICHH *Collaboratory*

- **Health Facility**
Focus on clinical genomics & proteomics
 - **Ergonomics Facility**
Focus on Intuitive software
Human-IT : Human-Computer Interaction
Integral-IT : Modelization and Visualization of Complex Results
 - **Materials Facility**
Focus on development of bio-inspired and intelligent materials
Materials characterization
 - **Arithmetic Facility**
Focus on Storage, Extrapolation and Modelization of results
- Vital-IT / SIB**

SICHH *Tech Facility*

- Cell & Microbiology P2 lab
 - CPU provider
Data Bank
 - Bio Bank
- CCOS Cell Culture of Switzerland / ZHAW**

December 2015

December 2015

SICHH

Immersive Experience (IE) Program

SICHH / CSEM / UNIFR

*Academic
Partners*

Collaboratory

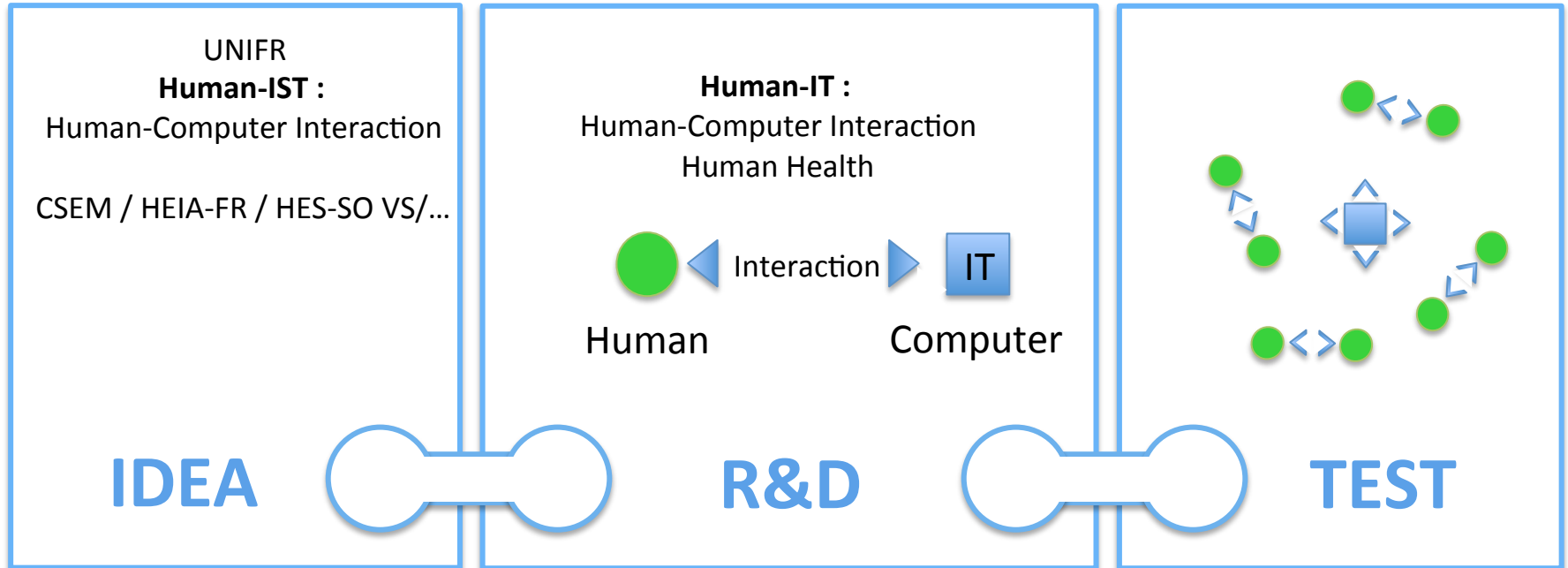
Forum



Fundamental
Research

Ergonomics Facility

Immersive Experience *IE*



Project Proposal Hasler Stiftung SICHH / CSEM / UNIFR

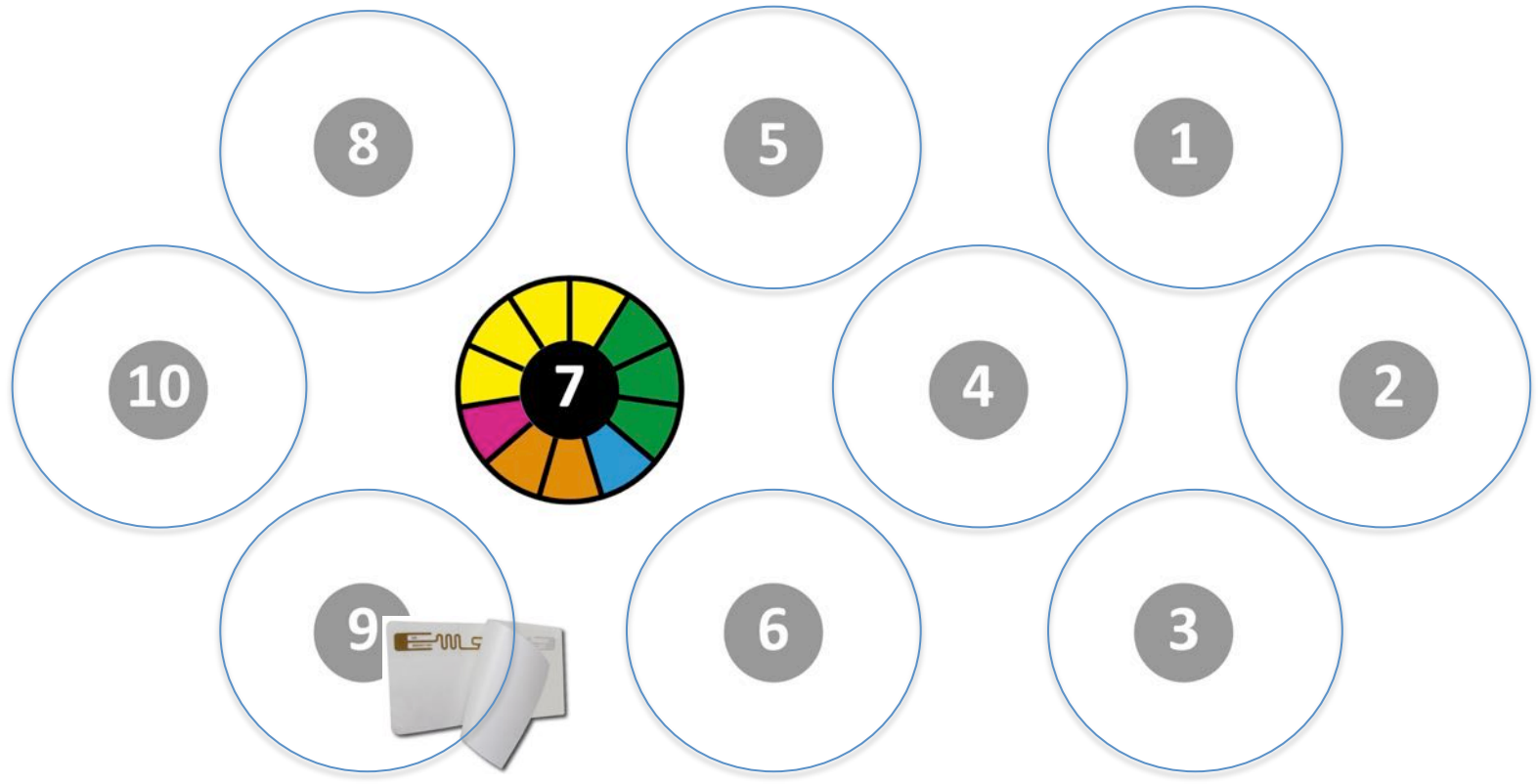


Immersive Experience

ERGONOMICS FACILITY

Buffet

Buffet



Buffet

Buffet

Entrance

SICHI Forum Presentation

- Nutrigenomics, Transcriptomics, Metabolomics
- Innovation by Integration
- Clustering & Innovation
- Nutrition Health & Wellness
- Fermented Food

SICHI

Smart Learning & Rehabilitation (SLR) Program

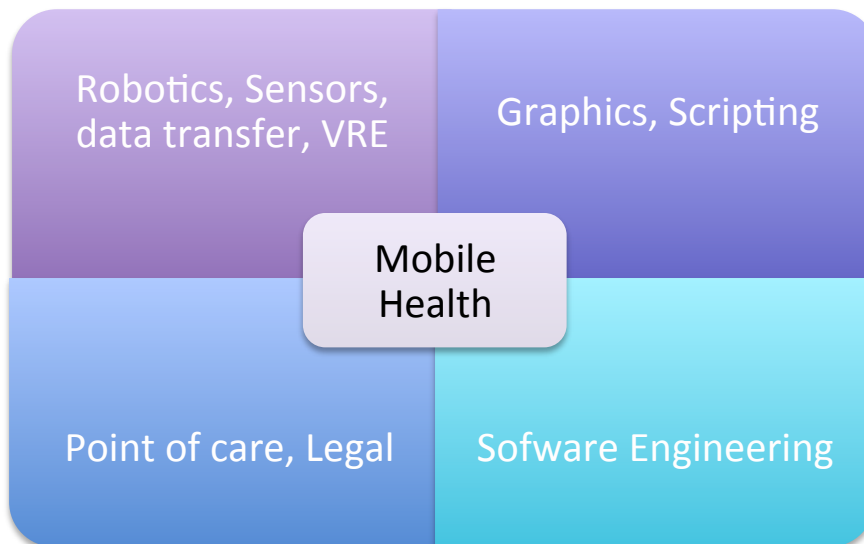
SICHH / UNIFR / HEIA-FR / EIKON/ ...

Technologies

- Visualisation/Software
- Sensors and Robotics
- Data Transfer, VRE
- Medical and Rehab Protocols
- Medical Accreditation, Data protection
- Graphics and Scripting

Application Areas

- Rehabilitation: Orthopaedics
- Neurological Rehabilitation
- Follow ups
- Elite Athlete Training



Combination of orthopedics rehab system and training software (image from Lambda Systems)

Biomimetic Reconstructive Materials (BRM) Program

SICHH / ...

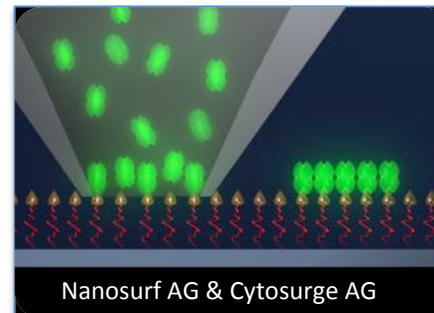
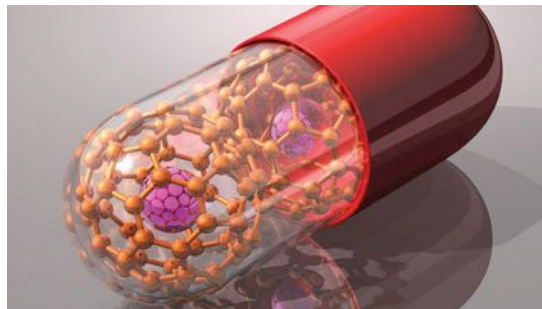
3D-modeling of complex structures at multiscale level

- Camera system (BRDF)
- Software representation
- Simulations



Nanotechnology for Nanomedicine

- Characterization and in Silico Reproduction of Biomimetic Materials
- New Nanosystems for Personalized Medicine
- Materials Functionalization



Food Origin, Safety & Quality (FOSQ) Program

SICHH /...

*«The cantons of Fribourg and Bern are important food producers in Switzerland»
Beat Vonlanthen, Region capital suisse cluster food and nutrition kick off*

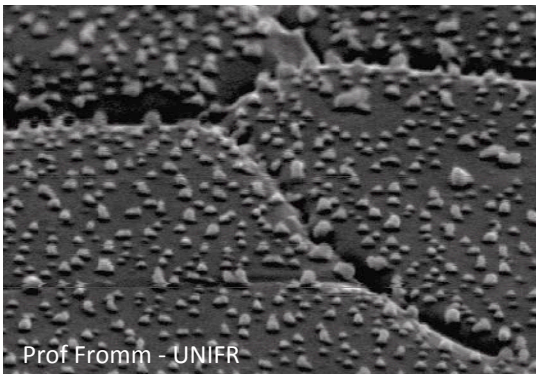
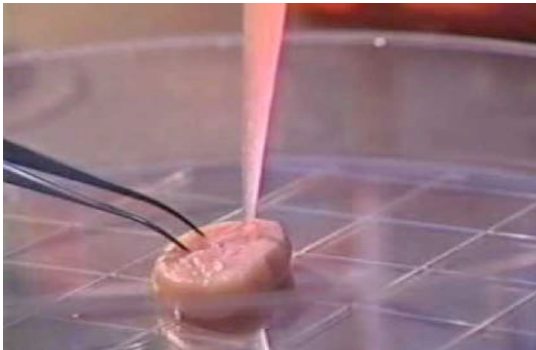
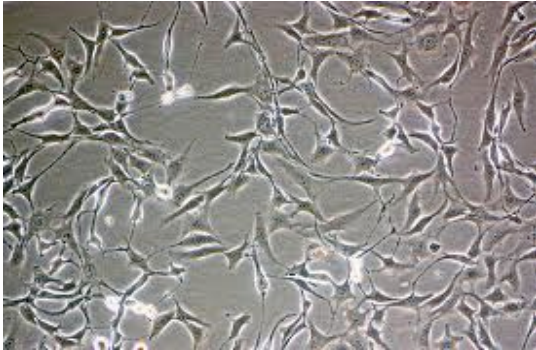
- Molecular Microbiology Testing (S+Q)
- Animal/Vegetal Species Determination (Genotyping) (O)
- Food Traceability, AOC Testing (O+Q)
- Functional Food (Q)



Future Collaborations : R&D for the food and nutrition Cluster / INNOSQUARE

Integrative Tissue Engineering (ITE) Program

SICHH / CCOS-ZHAW / INNOSQUARE / UNIFR...



Prof Fromm - UNIFR

- Interaction cells/materials (implants)
- 3D printing approach (survival of cells) (INNOSQUARE)
- Back up for Cell Culture of Switzerland (CCOS-ZHAW)
- Biobank service



Swiss Integrative Center for Human Health
A Unique Competence Center in the Heart of Switzerland

Conclusions

Every innovation relies on scientific expertise coming from a collaboration between public and private researchers

SICHH mission: provide services of **academic excellence combined with industrial execution for R&D projects**

In collaboration with his wide partner network, SICHH provides an added-value in the **management of complex innovative projects**

SICHH is offering a concrete answer in order to handle the complexity of technology developments

Brunner Jean-Marc PhD CEO Swiss Integrative Center for Human Health SICHH SA

siteminsel

**L'Institut suisse pour la médecine
translationnelle et l'entrepreneuriat**

**Swiss Institute for Translational and
Entrepreneurial Medicine
(sitem-insel AG)**

Qu'est-ce la médecine translationnelle ?

La médecine translationnelle désigne le transfert des découvertes de la recherche fondamentale et leur développement industriel vers des applications cliniques.

National Center for Advancing Translational Sciences, NIH: Director's Message 2013

«...au vu de l'abondance, unique dans l'histoire scientifique, de nouvelles connaissances issues des activités de la recherche et du développement, la transposition parcimonieuse de ces connaissances en produits concrets et utilisables chez les patients semble paradoxale...»

Raisons de l'évolution lente de ce transfert

- La protection de l'individu exposé pour la première fois
- L'absence de compréhension scientifique du processus translationnel
- La formation insuffisante des personnes impliquées dans le processus
- Des incitations inadaptées
- Le cloisonnement entre l'industrie et la recherche clinique universitaire
- Les aléas administratifs et réglementaires

Priorités de sitem-insel

sitem-insel ne met pas en avant certaines disciplines ou produits mais a choisi de concentrer son action sur trois aspects du processus translationnel :

- Formation de spécialistes de la recherche translationnelle (***School***)
- Mise à disposition d'infrastructures et de personnel à l'interface entre industrie, unités non-cliniques des hautes écoles et hôpital universitaire (***Enabling Facilities***);
- Contribution pour optimiser les processus administratifs et réglementaires depuis le laboratoire jusqu'à la commercialisation (***Translation Promoting Services***).

Approche de sitem-insel pour améliorer les conditions cadres dans la médecine translationnelle

I. Masterprogramm:

II. Enabling Facilities:

III. Translation Promoting Services:

General Principles of Curriculum

Full-time **Master**, 4 semesters, > 90 ECTS

or

separate modules for a:

- **CAS** (Certificate of Advanced Studies) or
- **DAS** (Diploma of Advanced Studies)

Full-time Postgraduate Master Program

Master thesis

- Project in translational medicine, 80% of time:
Industry \longleftrightarrow University
- Referees from private sector and university
- Language: English and one CH language

Full-time Postgraduate Master Program

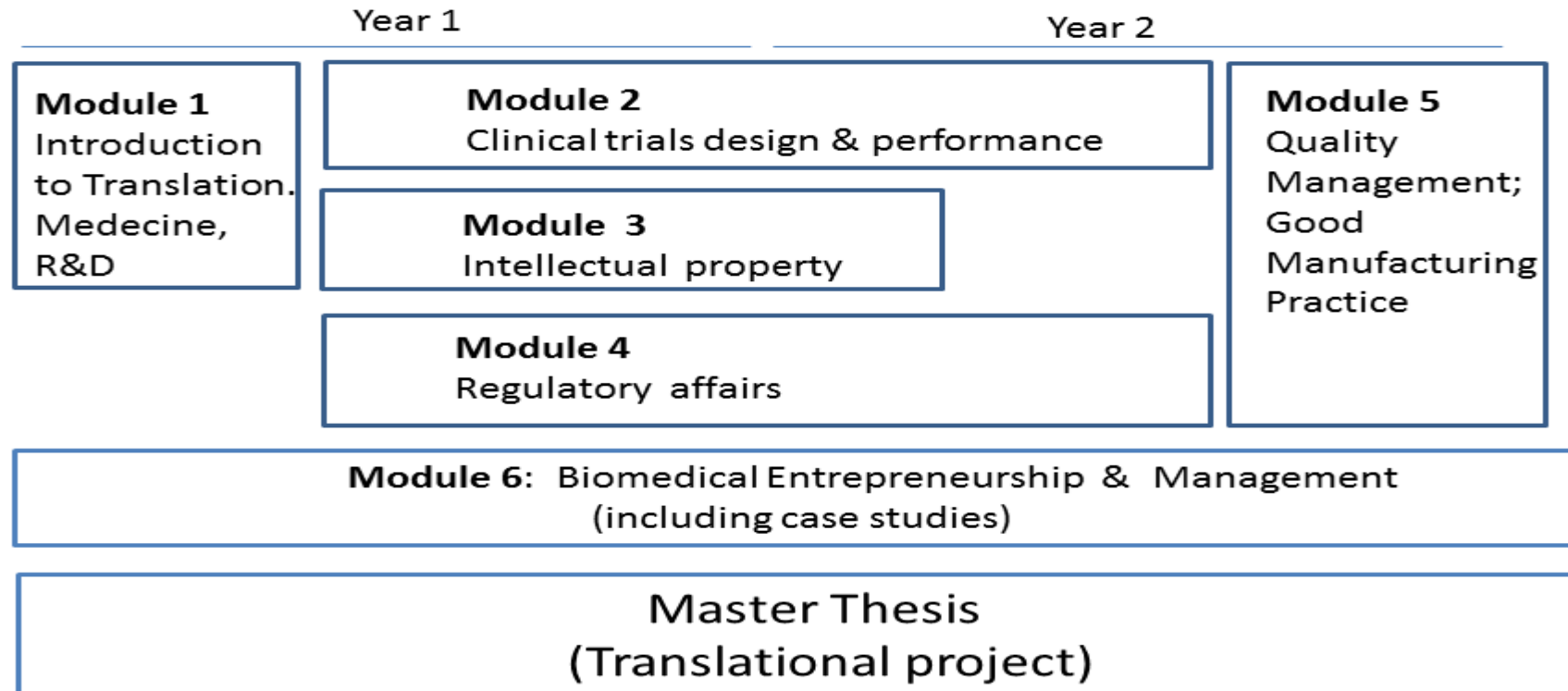
Theory: 20% of time for 2 years

Teaching modalities:

- Frontal lectures
- Case studies
- Seminars
- Blended learning: E-Learning platform
- Hset= Hhealth sscience e-training

SITEM School

Master of Advanced Studies in Translation and Entrepreneurship in Medicine



(for diagnostics, drugs and biomedical devices)

Master Thesis = Project presentation

Voraussetzungen für die Zulassung zum MAS Studiengang

- **Akademiker mit abgeschlossener Hochschulausbildung** (Naturwissenschaftler, Ingenieure, Pharmazeuten, Mediziner, Veterinäre etc.) und dreijähriger Berufserfahrung.
- Englischkenntnisse auf TOEFL Niveau.
- Karriereplan und Empfehlungsbrief des Direktors der Institution oder des Vorgesetzten aus dem industriellen Betrieb.
- Masterprojekt, das als "Pass zum Studium" dem Curriculum Committee vorgestellt wird und von die-sem akzeptiert werden muss.

Approche de sitem-insel pour améliorer les conditions cadres dans la médecine translationnelle

I. Masterprogramm:

II. Enabling Facilities:

III. Translation Promoting Services:

Planification du bâtiment pour Enabling Facilities

1. Infrastructure standard

- Ateliers Medtech
- Laboratoires de biologie et chimie

2. Infrastructure pour des techniques avec des caractères architecturaux spécifiques:

- Anatomie clinique
- Clinical Trial Center (CTC)
- Brain Interface Technology Lab (BIT) et BrainBehaviorLab (BBL)
- Salles d'opération hybrides (Simulationszentrum)
- Imagerie médicale
- Biobanque
- Technologies de pointe:
 - Metabolomics
 - Fabrication additive
 - Nanotechnologie
 - Thérapies cellulaires

Approche de sitem-insel pour améliorer les conditions cadres dans la médecine translationnelle

I. Masterprogramm:

II. Enabling Facilities:

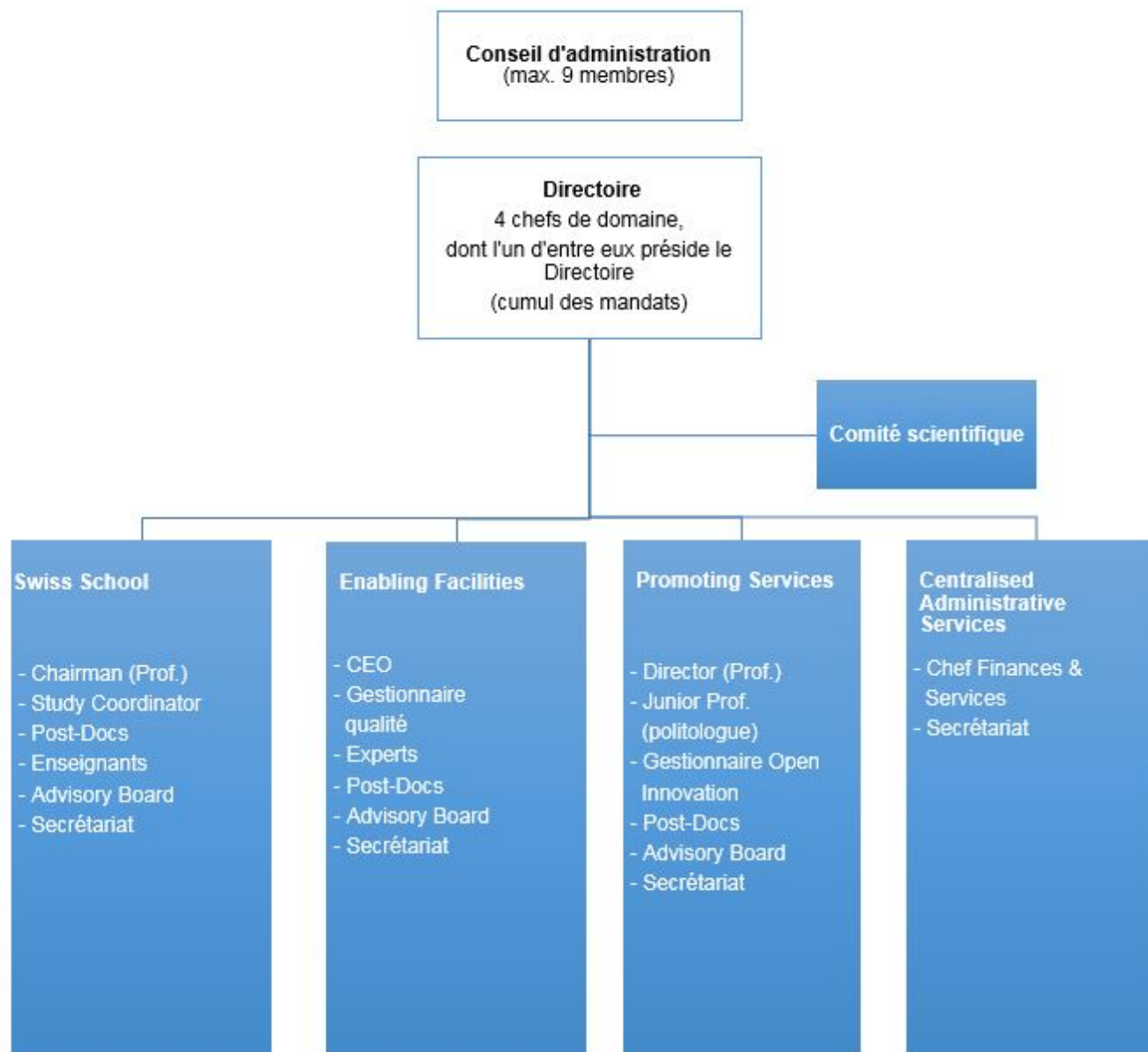
III. Translation Promoting Services:

Auswahl von Agenturen am Weg des Translationsprozesses

- Ethisches Komitee
- Swissmedic
- Unitectra
- Amt für geistiges Eigentum
- CE-Kennzeichnung
- Spitalverwaltung
- Unternehmensinterne Verwaltung
- Marktforschungsinstitut
- Finanzquellen (KTI, EU-Grants, >150 financial „enablers“)

Translation Promoting Services

- Professur für „Regulatory Affairs“
- Think Tank : Translational Medicine
- Förderung der Interaktion zwischen den Agenturen



Verwaltungsrat

- Dr. Urs Schwaller, Rechtsanwalt, Präsident sitem-insel AG, Fribourg
- Dr. Michèle Etienne, Mitinhaberin Innopool AG, Co-Geschäftsführerin GetDiversiy, Schüpfen
- Uwe E. Jocham, Direktionspräsident CSL Behring AG, Bern
- Dr. Bruno Oesch, Executive Chairman Nerotune AG, CEO Malcisbo AG, Gründer Prionics, Zürich
- Prof. Claudio L. Bassetti, Klinikdirektor und Chefarzt Universitätsklinik für Neurologie Inselspital Bern
- Dr. Gerhard Bauer, Head Research, Development & Operations, Institut Straumann AG, Basel
- Prof. Martin Täuber, Rektor Universität Bern

Geschäftsführung

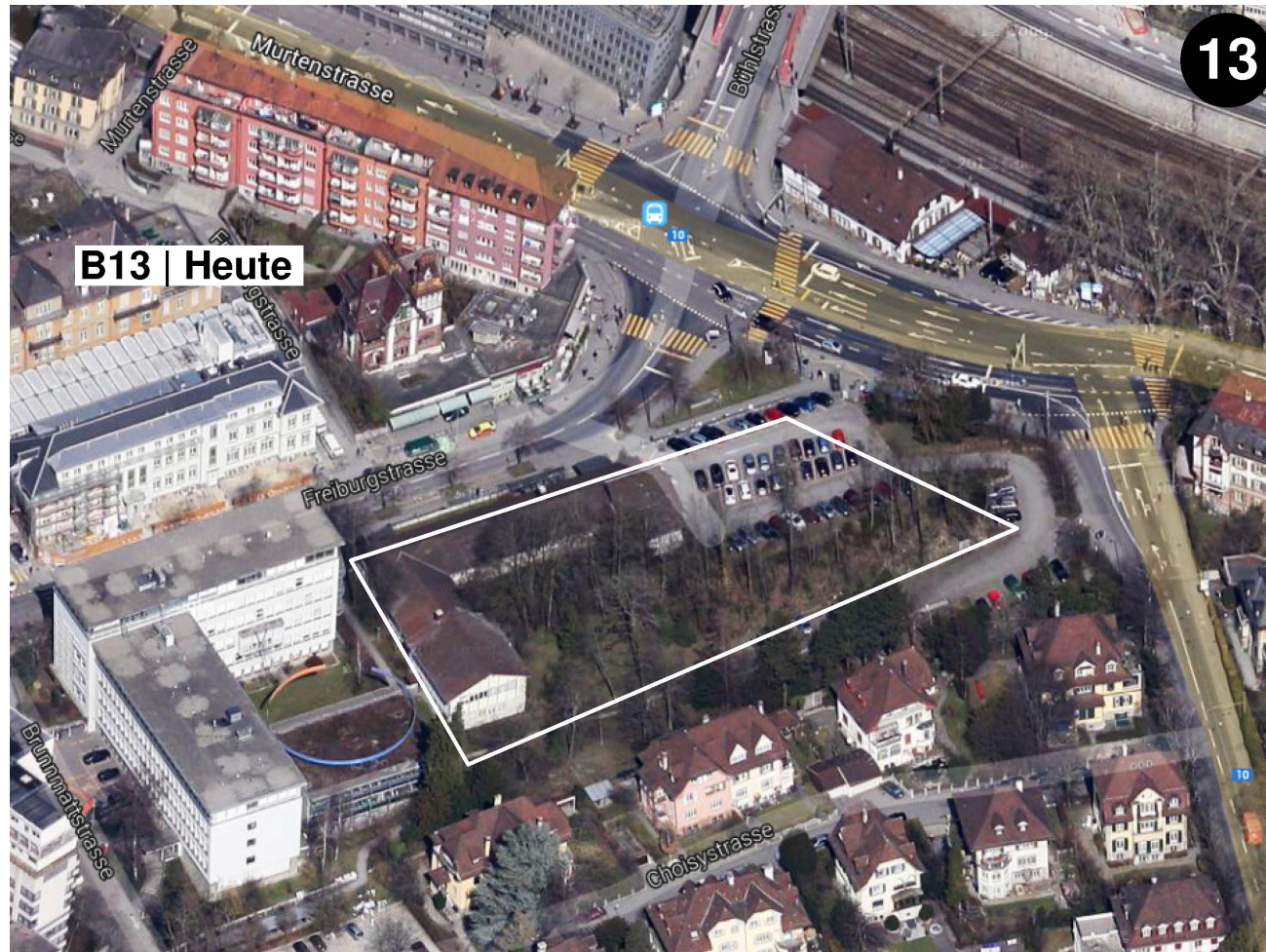
- Prof. Felix Frey, Geschäftsführer sitem-insel AG

Konzeption sitem-insel AG



Nicht-gewinnbringende AG

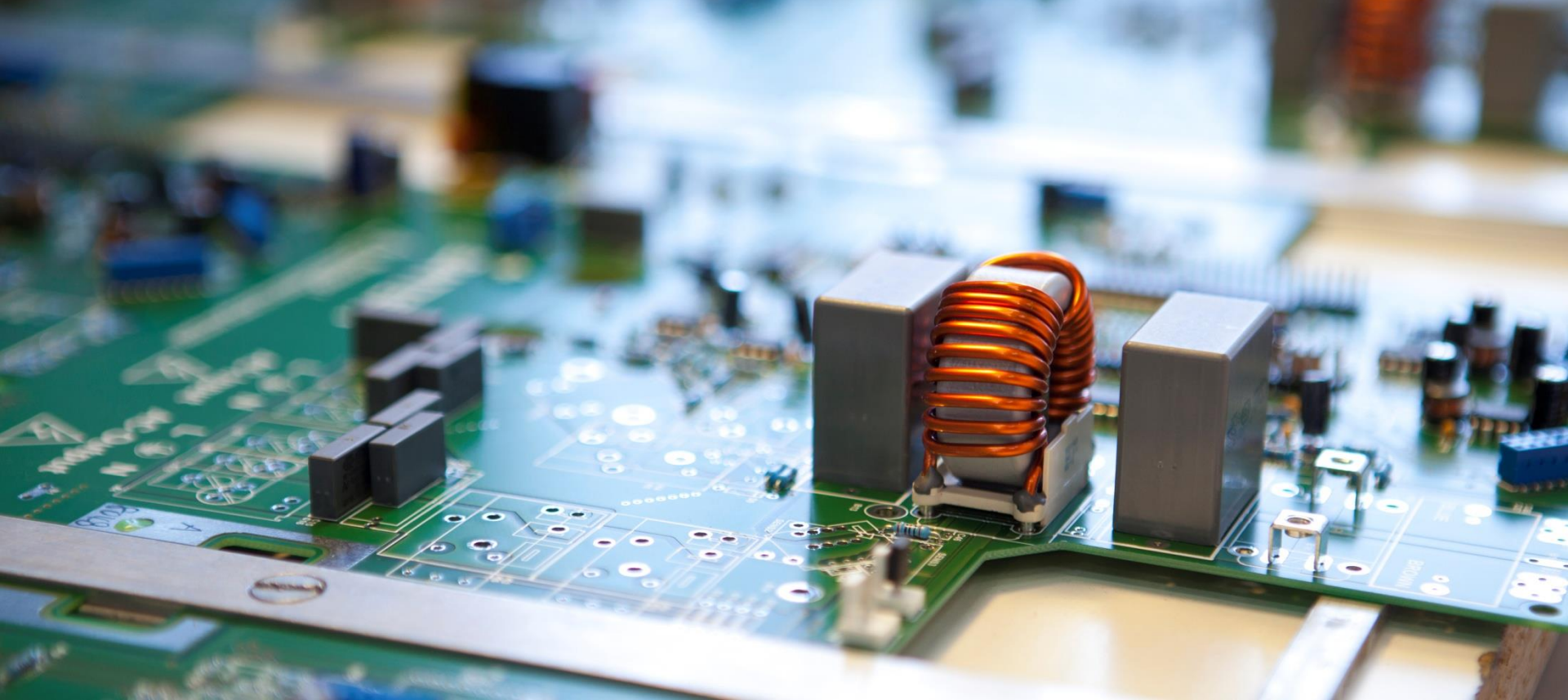
Grundstück / Standort





Fostering Life Sciences Business

BIOARK



the **ark**

La Fondation
pour l'innovation en Valais



Services The Ark

the ark
Accélérateur



Porteurs de technologies et entreprises

the ark
Incubateur



Créateurs d'entreprises innovantes

the ark
Innovation



PME valaisannes

Innovation: Chaîne de la valeur en Valais



11 chaires



10 instituts



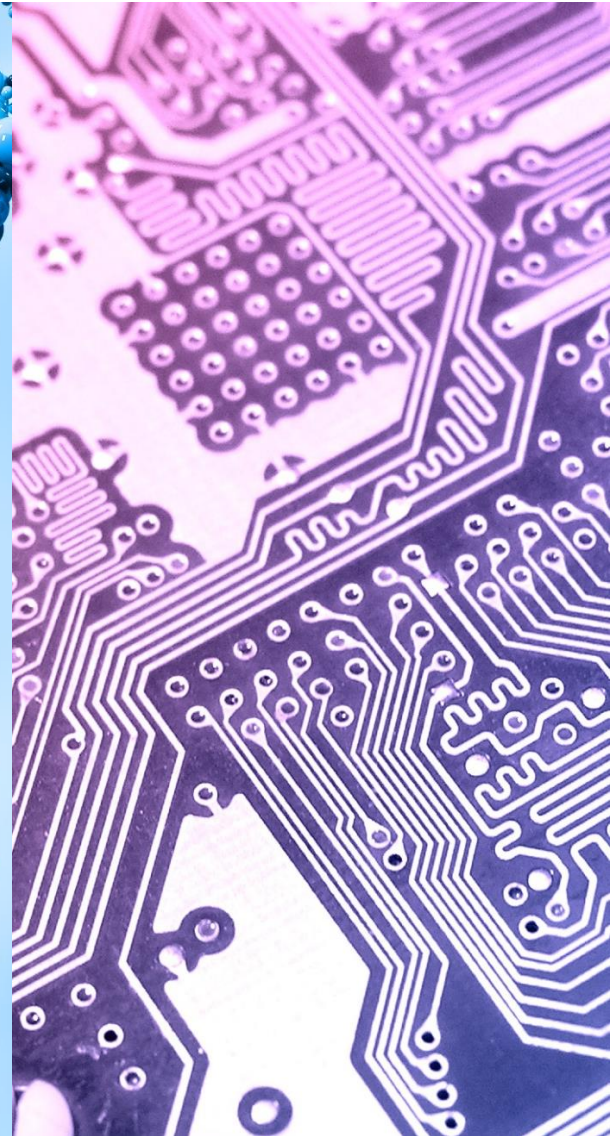
6 parcs technologiques



1 outil de développement économique



3 Domaines





Sciences de la vie



Sciences de l'informatique et de la communication



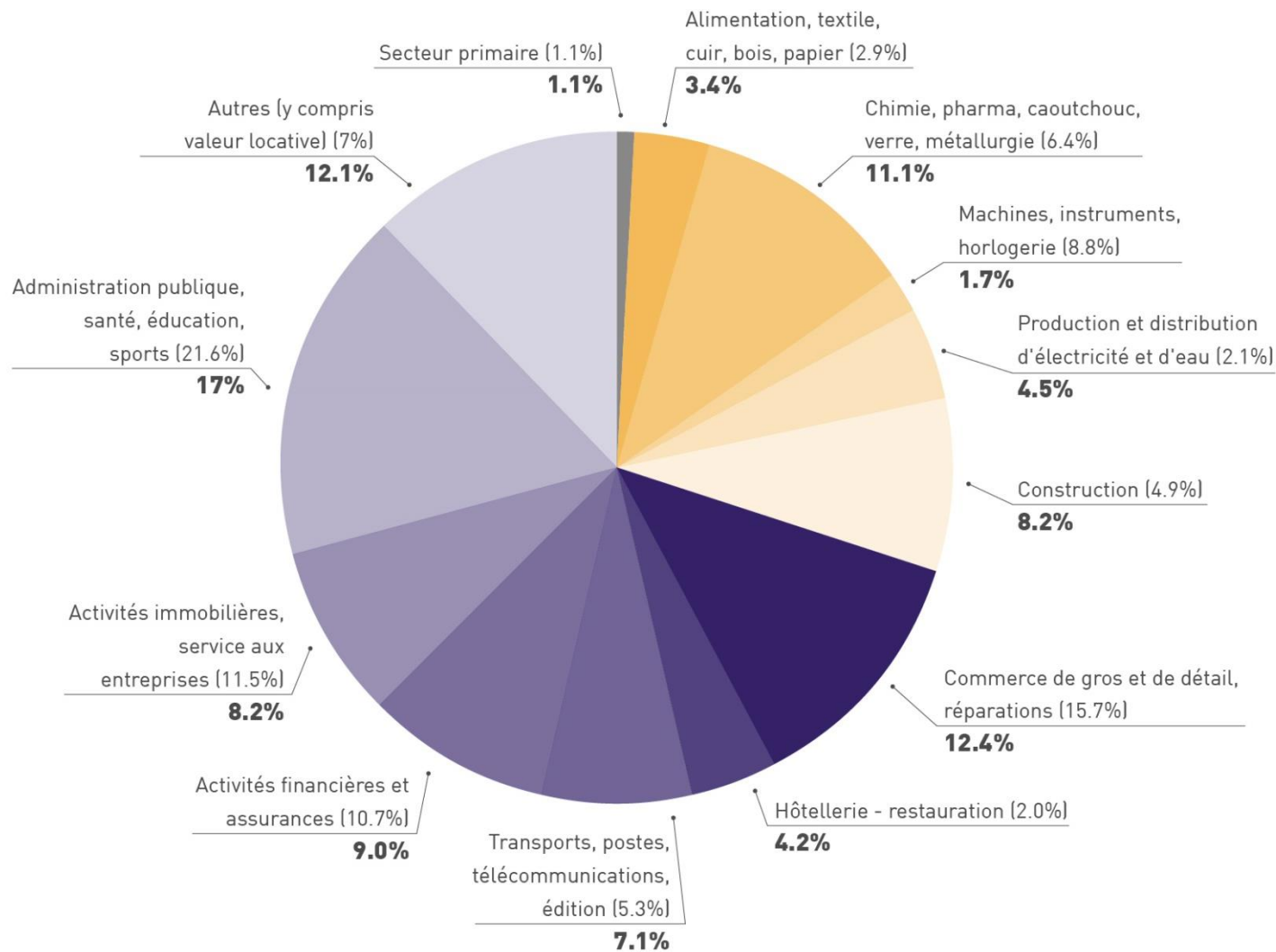
Energie et environnement



energypolis

INDUSTRIE 17

Distribution of the GDP valais in comparison with the GDP «romand»





Faciliter l'industrialisation grâce à des services et des équipements high-tech

BioArk Monthey, dedicated to real industries

- › Creation in 2003 with 2500 m²
- › Foster the development of Innovative Life Science Industries
- › 30 Mio CHF investments in land and building
- › Total capabilities of 6500 m² and 27'000 m² available for industrial implementation

Residents



KLAHAS

MMOS



10 years: providing concreteness to Life Sciences industry

- › Start-up and SMEs are struggling to finance their activities:
 - › Investors not willing to invest in CAPEX
 - › Lowering the risk of investment: the only asset considered is the molecule/product
- › Moving towards a new business model: providing infrastructure and services in a Public-Private Partnership

Swiss Biotech Center



Disposable cGMP manufacturing

A flexible technology in line with the biotech trends.
Positioned for clinical studies and small specialty batches.

Innovative fill & finish shop
A flexible technology provided by the worldwide innovation leader in fill & finish lines.
Positioned for clinical studies and small specialty batches.



Alpine plants as innovative products

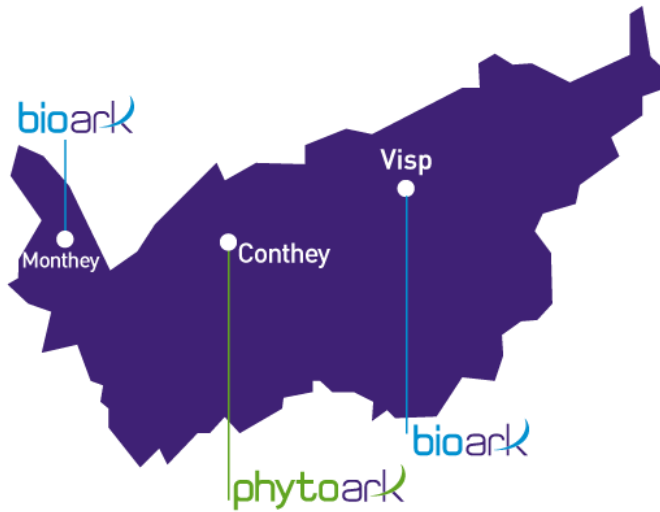
Development of new ingredients
Formulation and prototyping of finished products

Exploiting Later Flow Potential
Later Flow is one of the unique Point-of-Care technology well accepted by authorities
Fast time to market





SWISS
BIOTECH
CENTER





Valoriser les plantes alpines dans des produits à forte valeur ajoutée



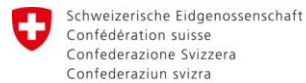
Développer la chaîne de valeur des sciences de la vie

Swiss Biotech Center: partners

Institutional



Academic



Département fédéral de l'économie,
de la formation et de la recherche DEFR
Agroscope

Politic

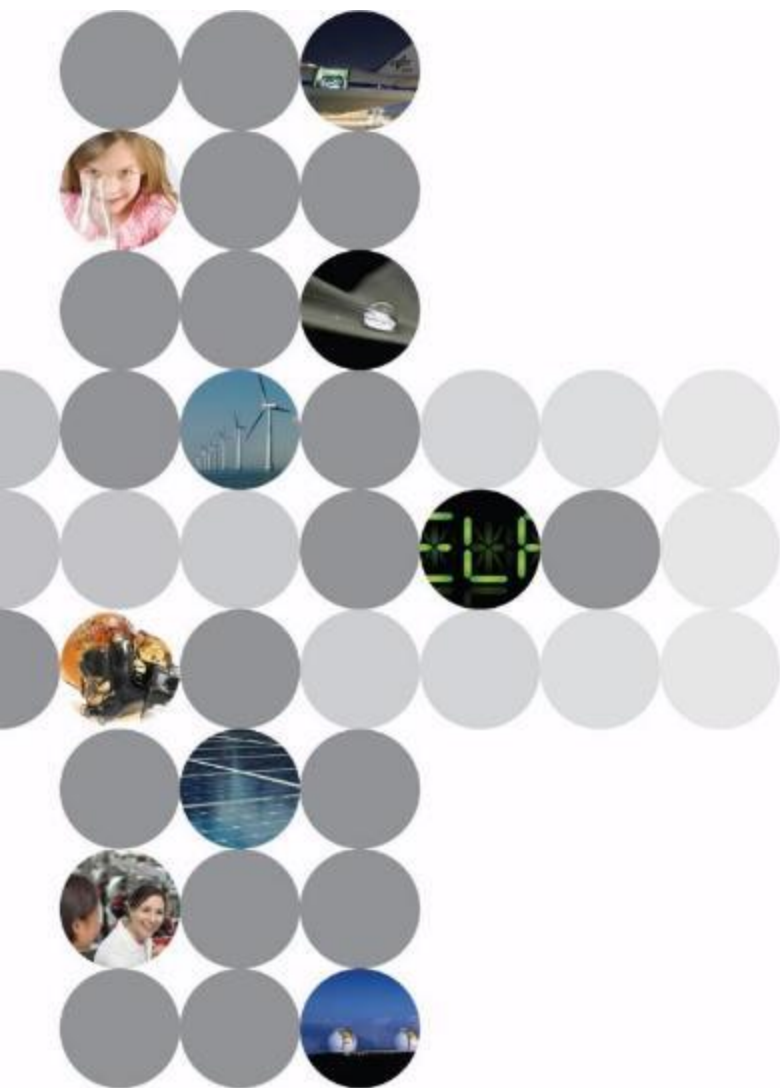


Private



Partnerships, the key of success

"It is the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed." - *Charles Darwin*



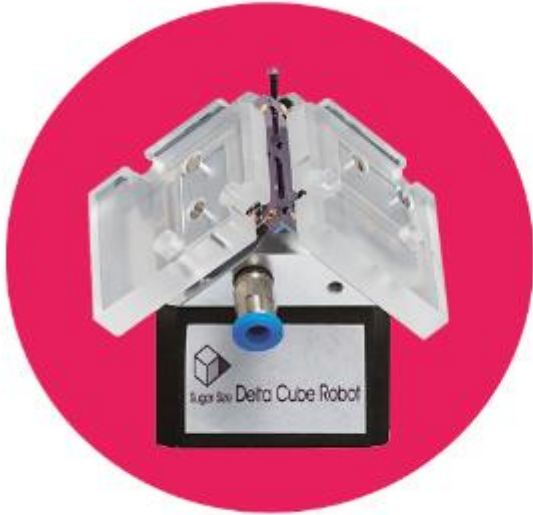
première plateforme Santé de la Région capitale suisse

CSEM
*technologies
that make **the** difference*

Georges Kotrotsios
gko@csem.ch

17 novembre 2015

Our mission



Development and transfer of microtechnologies to the industrial sector – in Switzerland, as a priority – in order to reinforce its competitive advantage

- ⌘ Cooperation agreements with established companies
- ⌘ Creation of start-ups

CSEM at a glance



83

Turnover
(mio
CHF)



35

Nationalit
ies



+460

Persons



44

New
Ventures



211

Partners



+350

Industrial
Projects



184

Patent
Families



67

European
Projects

The innovation landscape and the need

- Switzerland is extremely rich in
 - Academic knowledge
 - Industrial networks
 - High Quality Hospital
- Industrialisation: a big hole for European / Swiss landscape

The role of catalysers

- Academia and University hospitals need to focus to top level research to remain competitive
- Industry focus to next quarter's results to remain competitive
- The complexity of the products increases
- The gap between *lab* and *fab* increases

- «intermediaries» are needed
 - Medical Translational organisations: eg. Sitem
 - Incubators
 - RTO (Research and Technology Organisations): eg. CSEM

What we perceive as Big Trends in Technology for Health

Cell Handling

- Development of cell therapies
- Move from animal to cell culture tests for cosmetics, chemicals and pharmaceuticals (3Rs): need for better cell culture models

Sensors

- On-body & implantable sensors
- e-health, m-health
- Increased quality control in food & environment

Sample Handling

- Improved process control and verification in diagnostics instruments
- More quantitative results wanted from smaller samples

Common denominator, beyond medical knowledge

- High end, complex and multi-disciplinary
- Miniaturized: portable, wearable, implantable
- Energy Efficient
- Connected

This is microtechnology and ICT

Medical device technology: stand-alone sensor



Use case «PulseOn»: the most accurate HR watch



www.pulseon.com



Use case «SENSE»: human performance monitor



www.senseyourcore.com

- ✓ ECG, HR
- ✓ impedance, BR
- ✓ temperature
- ✓ activity, steps, speed



Smartwatches



iFIT



Link



Vue

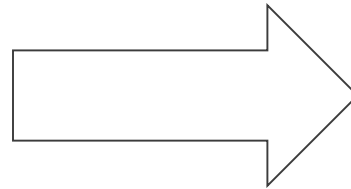
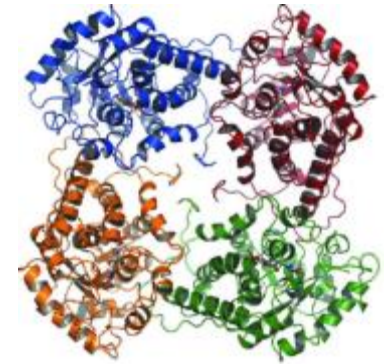


Continuously monitoring lactate with a patch ...

classical approach



CSEM sensors



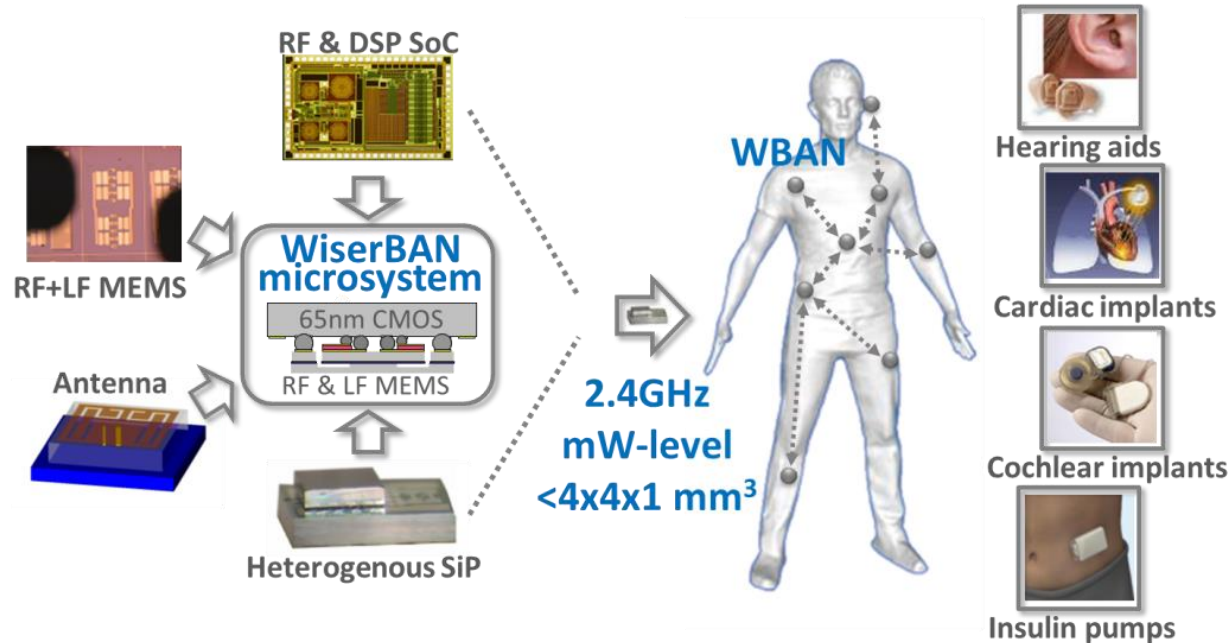
Use case «SWISSTOM»: the future of EIT



www.swisstom.com

✓ Start-up 'Swisstom SA' in Landquart

Wireless area networks



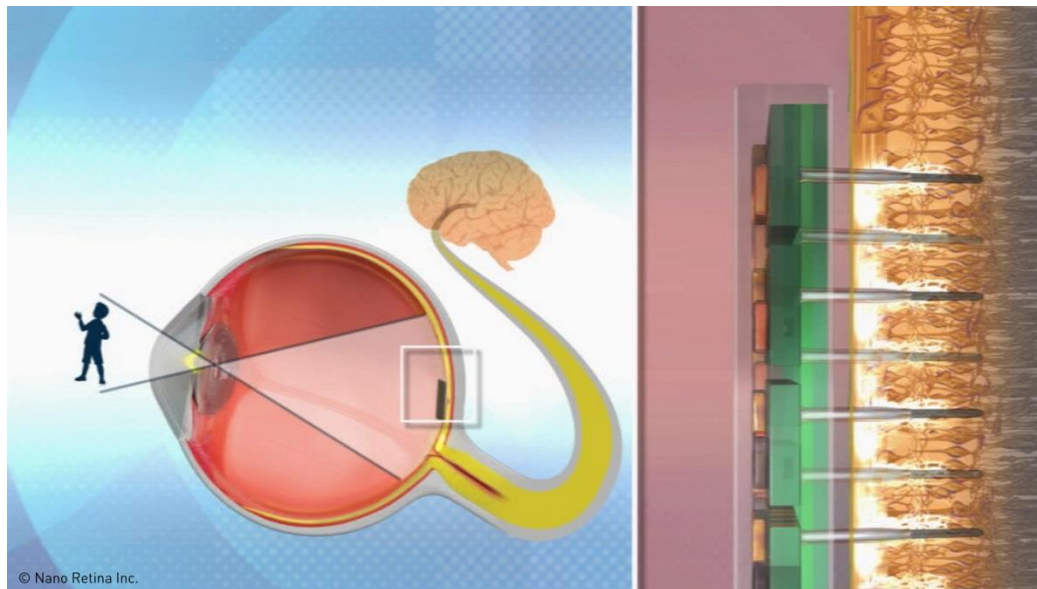
**Low power wireless microsystems
for health and wellness**

Better life for our elderly and disabled



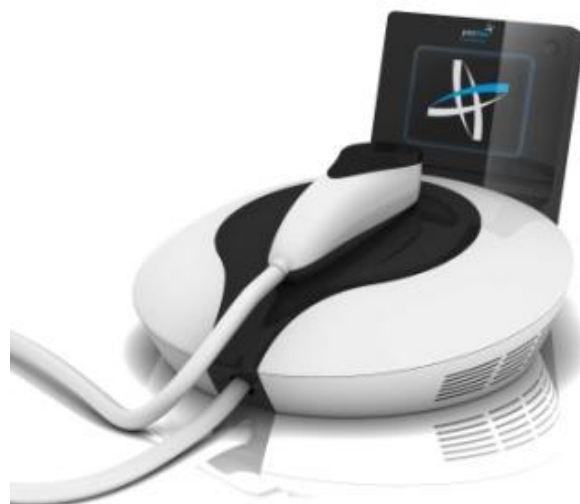
A long tradition in Electronics and Software for hearing aids

Better life for our disabled



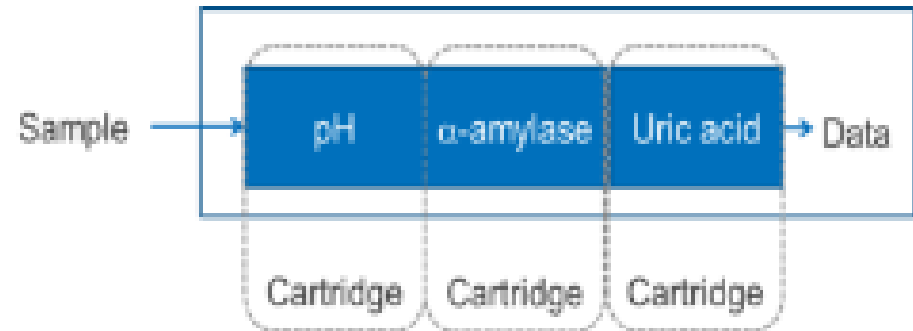
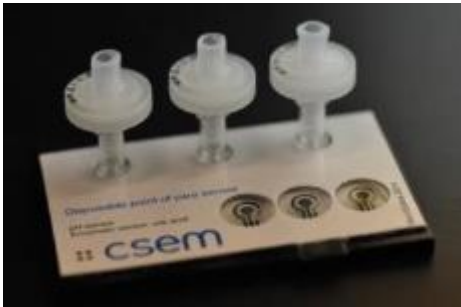
Nanoretina: An implantable IC to restore vision for the blind

Skin therapy

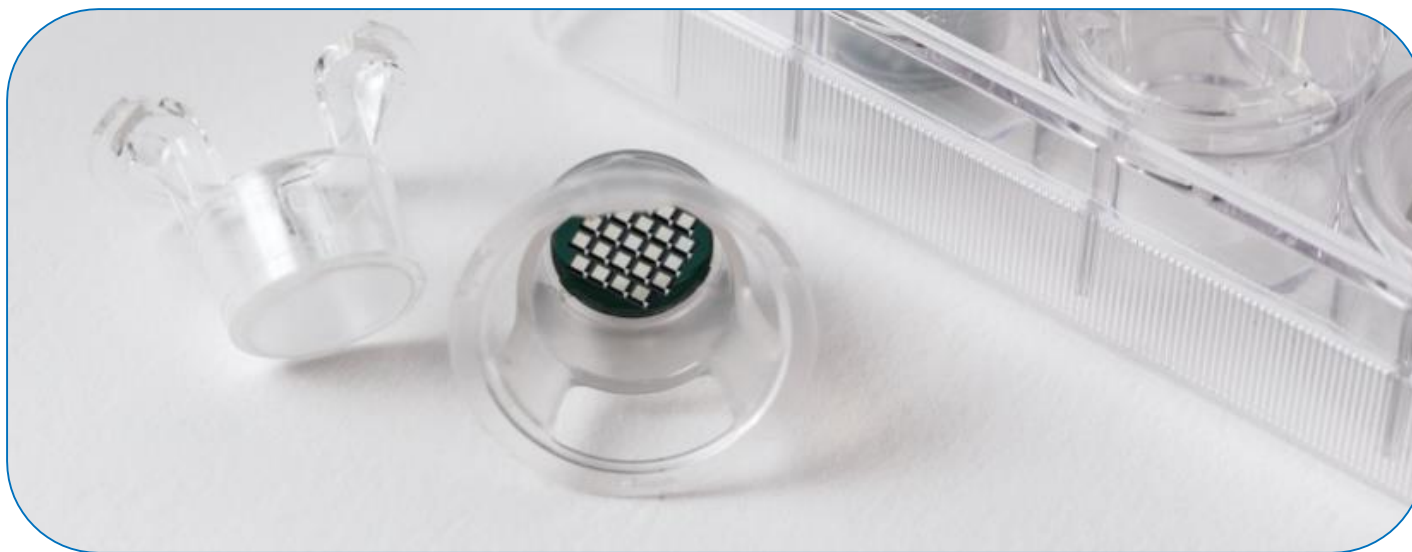


... and biochemical sensors beyond lactate

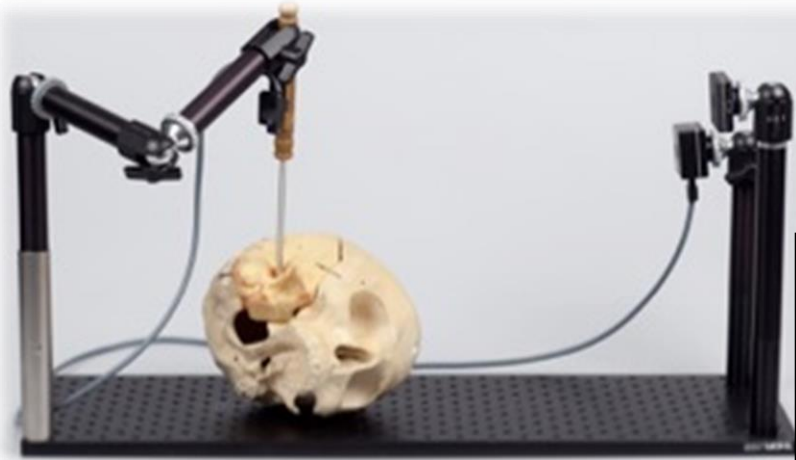
Beyond sweat: saliva



Cell Handling: SIMPLI - a new device for cell culture



Metrology: 6D optical tracking systems



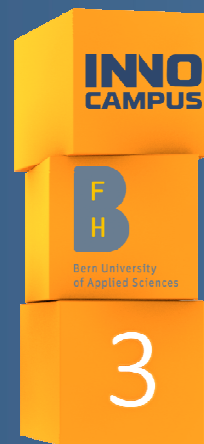
Merci





MedTech Initiative:

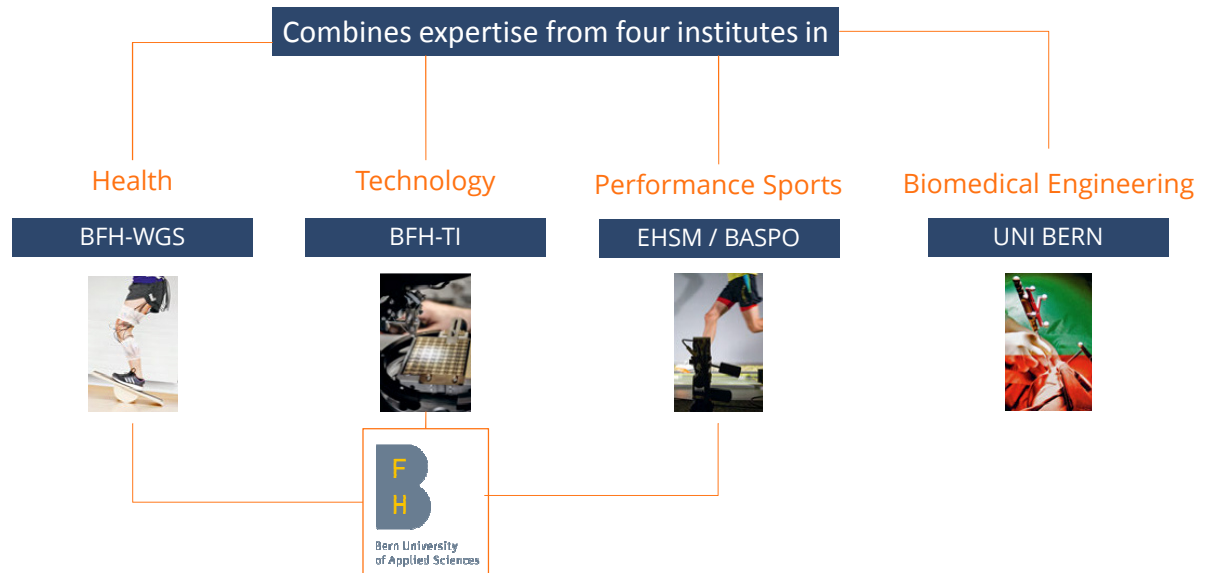
- ▶ INNOCAMPUS
- ▶ BFH Zentrum Technologien in Sport und Medizin



$$1 + 1 = 3$$

AVP1

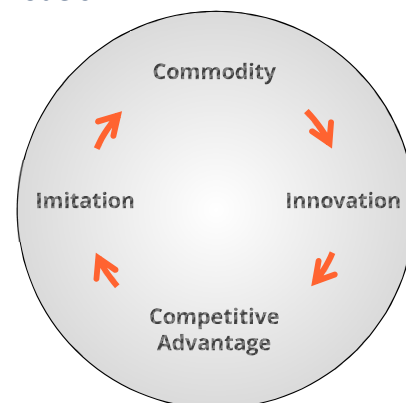
BFH-Center for Technologies in Sports and Medicine



Importance of Innovation

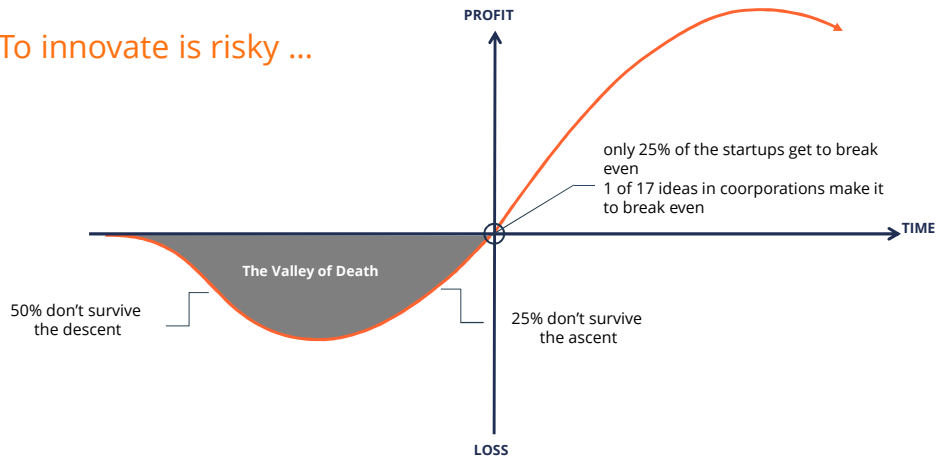
Two dominant ways to business success

- ▶ **Relocation** to low-cost low-wage countries
- ▶ **Innovation** in products, processes and business models

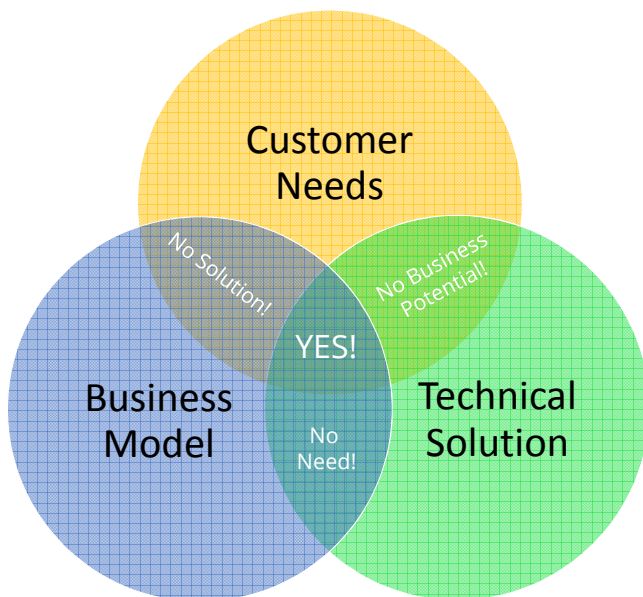


Innovation as a challenge

To innovate is risky ...



Source: creaholic



Work out answers ...

- ▶ Which problem do we solve?
- ▶ How do we solve it?
- ▶ How can we earn money?



“ Idea in the innovation pipeline! ”

- ▶ To many open questions
- ▶ Interdisciplinary
- ▶ Out of the box

INNOVATION Projects

Formulation of the Questions

Team / Competences

Project Management
/Coordination

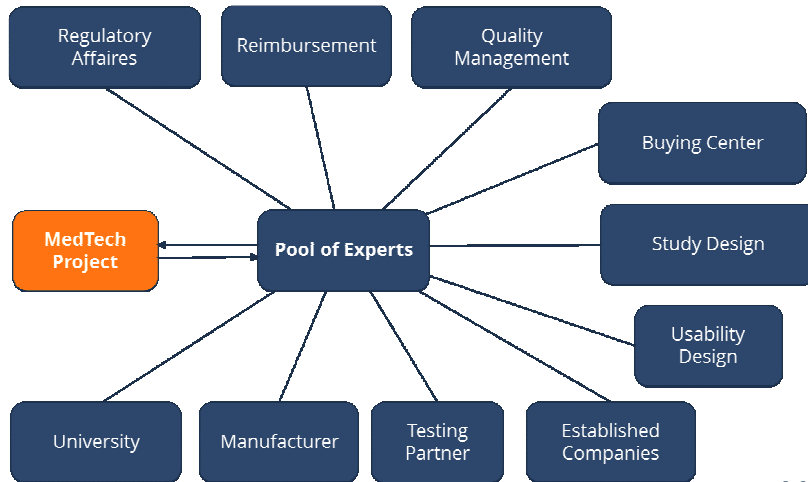
Financing
(by Government Grant)

Steering Committee



Playground

Pool of Experts



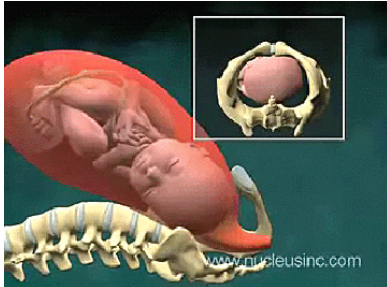
MedTech has its own rules!

Project Examples



Projects

Vibwife - SAFER & SHORTER BIRTHS



Facts

- ▶ 10'000 unplanned C-Sections each year (20%)
- ▶ Hospitals lose CHF 2'000 in average per unplanned C-Section
- ▶ Each CHF 15 Mio health insurances and public hand

Problem

Proven manual techniques that help shortening the time for giving birth and thereby reduce the risk for an unplanned C-Section are not applied, since they are very physical and time-consuming.

Solution Approach

An interdisciplinary team of midwives, mechanical and electronical engineers are developing a device that imitates the manual techniques.

Projects

3D Automated Whole Breast Ultrasound Imaging



SONOVIEW
Acoustic Sensing Technologies

Facts

- ▶ 1 in 8 women will develop breast cancer
- ▶ > 500'000 women die from breast cancer each year
- ▶ When detected early, breast cancer is 98% curable

Problem

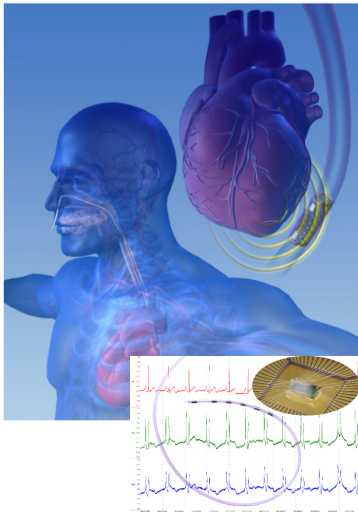
In contrast to x-ray ultrasound imaging is not posing a risk to the body. However it provides much lower resolution and thereby often leads to misinterpretation.

Solution Approach

The key innovation lies in coupling new sensors with sophisticated computing algorithms that enables much higher resolution and for that better diagnosis capabilities.

Projects

Long-term Esophagus ECG



Facts

- ▶ Atrial fibrillation (AF) is most common cardiac arrhythmia, 1-2% of 65-aged, 10% of 80-aged.
- ▶ Patients with AF have increased risk of thromboembolism.

Problem

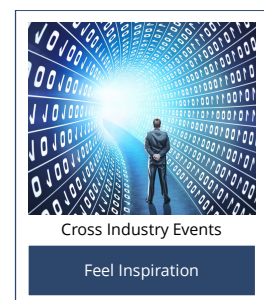
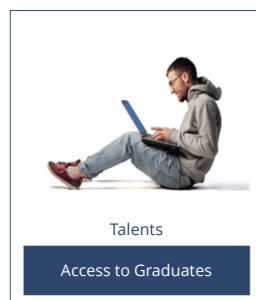
Clinical standard to diagnose AF is 24h-72h surface ECG, whereas limited atrial signal quality and paroxysmal behavior limit this screening quality. As a consequence arrhythmias often remain unrecognized.

Solution Approach

The closeness to the heart from the esophagus results in high quality signals revealing the atrial activity. The BFH develops new catheters and atrium/ventricular classification algorithms.

Project Partner: Bern Univ. Hospital, CTI project financing 2015-2016

Summary - Discussion



Thank you for your attention!



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