The field of diagnostics and the use of biomarkers are apparent in the inevitable trend of precision medicine.

The Swiss Integrative Center for Human Health (SICHH) is launching "Swiss Smart Diagnostics", an industrial division dedicated to the development of diagnostics, in order to respond to this trend.

Swiss Smart Diagnostics provides an efficient framework for companies to enhance their research and development projects and contributes to maintaining Switzerland’s world leader position in innovation.

SICHH and its industrial division Swiss Smart Diagnostics are supported by:

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Summary
The field of diagnostics and the use of biomarkers are evident in the inevitable trend of precision medicine.

The development of diagnostic technologies will lead to a better understanding of disease mechanisms and will allow more accurate, personalized treatments, thereby reducing the financial burden stemming from ineffective treatments or the harmful effects of inappropriate medications. These tests also allow adequate monitoring of patients throughout the disease.

The Swiss Integrative Center for Human Health (SICHH) is launching "Swiss Smart Diagnostics", an industrial division dedicated to the development of diagnostics, in order to respond to this trend.

Swiss Smart Diagnostics provides an efficient framework for companies to enhance their research and development projects and it allows them to generate new business opportunities. The partner companies benefit from the skills, infrastructure and integrative environment in the development of innovative technologies. The industrial division is an alternative to companies’ internal research and development departments.

Swiss Smart Diagnostics is based on SICHH's fully integrative competency model. SICHH responds to a universal need for solutions rather than techniques and acts as a single-entry point to a wide range of skills, methods, and tools for solving various scientific problems.

About SICHH
Swiss Integrative Center for Human Health

SICHH is a unique center of expertise in the field of human health. Established in the blueFACTORY innovation district, it aims at strengthening the innovation capacity of Swiss companies by carrying out research projects and by offering integrative research and development solutions. SICHH applies an innovation methodology by integrating skills to carry out projects in its high-tech platforms. As a gateway to academic research for the private sector, SICHH supports innovation players in the fields of medical technology, biotechnology, food technology, and other human health-related fields.
Precision Medicine

Increase in the effectiveness of diagnostic treatments

Depending on the type of disease, the frequency of patients for whom conventional therapies do not work is in the range of 30 to 60%, or even 75%1,2,3 in some cases. This unsatisfactory therapeutic result can be explained in particular by the use of an ineffective standard model for many patients, as opposed to personalized precision medicine.

The choice of the field of diagnosis and the use of biomarkers is evident in the inevitable trend of precision medicine.

Precision medicine is based on the implementation of diagnostic tests. Those tests build on biomarkers, increasing the likelihood of administering effective treatment, whether for new or existing drugs. The diagnostic tests can be called companion tests and allow patients to be categorized according to their therapeutic needs.

The development of diagnostic technologies will lead to a better understanding of the mechanisms of the disease and to more precise, personalized treatments, thus reducing the financial burden due to ineffective treatments or harmful side effects.2 These tests also allow the patient to be monitored throughout the disease more appropriately.

The diagnostics market is a promising field that is experiencing strong growth in Europe, notably through new regulations implemented by the European Diagnostic Clusters Alliance (EDCA).

Budgetary restraints and the increased centralization of both private and public laboratories have increased the purchasing power of key organizations active in the field of in-vitro diagnostics.4 It is estimated that the 2017 per capita expenditure on in vitro diagnostic tests will be around 60 CHF in Switzerland5 with the average annual global growth of 4.2% between 2018 and 2025.6

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1 Clinical evidence, British Medical Journal, 2007
2 B. B. Spear, M. Heath-Chiozzi, Huff, Clinical Trends in Molecular Medicine 2001, 7, 201–204
4 Graphical Research (2018): Europe In-vitro Diagnostics Market to achieve 5.7% growth over 2018-2024
5 Medtech Europe 2017 (2017): European IVD Market Statistics
Crossing the Valley of Death of Innovation
Swiss Smart Diagnostics

The phase between basic research and successful innovation is commonly referred to as the "valley of death."\(^7\,8\) Taking this difficult step of innovation is a risk for any company, including the largest enterprises, however, it is necessary to innovate to keep a competitive position.

In order to cross this "valley" and thus enhance the fruits of research, the Swiss Integrative Center for Human Health (SICHH) has developed an industrial division model dedicated to the development of diagnostic tests: "Swiss Smart Diagnostics".

It operates on the basis of a partnership between SICHH and a company by creating a specialized structure within SICHH, an alternative to an internal research and development department of the company. The company benefits from the skills, infrastructure, and integrative environment to develop innovative technologies.

Innovation through skills integration
A methodology for the future of science

The integrative model is emerging in Europe and is part of a global trend. It can be observed in the European Research Infrastructure Consortium (ERIC) initiative and the Francis Crick Institute\(^9\), as well in INSTRUCT-ERIC\(^10\) and the Institute for Innovation in Biotechnology in Auckland\(^11\).

Operating on a fully integrated competency model, SICHH responds to a universal need for solutions rather than techniques. SICHH is a single-entry point to a wide range of skills, methods, and tools for problem-solving.

SICHH stands out for its ability to combine internal technological skills with external skills from its partners while offering programs dedicated to the various players in the innovation process.

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\(^7\) https://www.sciencedirect.com/science/article/pii/S1359646613000342
\(^8\) See also: What Do We Learn from Good Practices of Biologically Inspired Design in Innovation? Applied Sciences 9(4):650 - February 2019 DOI: 10.3390/app9040650
\(^9\) https://www.kcl.ac.uk/crick/crick.aspx
\(^10\) https://www.structuralbiology.eu
\(^11\) http://www.biotech.co.nz/about-us/
Supporting SICHH
Advancing research and innovation

For the period 2021-2024, SICHH requires the support of the Confederation in order to consolidate its infrastructure and activities in research and development and in order to develop an industrial division dedicated to diagnostics. It has already gained support from the Canton of Fribourg, Switzerland Innovation Park, as well as from four international companies wishing to collaborate on long-term projects within the industrial division Swiss Smart Diagnostics. A dozen other companies support Swiss Smart Diagnostics (SSD) and consider SICHH a potential partner. These key players in the diagnostic sector will be connected by SSD, providing a technology monitoring platform and generating new business opportunities.

SICHH calls on government members and policy makers to actively support its ambition to become a nationally significant center of technological expertise under section 15 of the Research and Innovation Incentive Act.

Supporting future SICHH activities would enable SICHH:

- **To optimize and accelerate the innovation process of national companies** through easy access to existing knowledge and advanced technologies developed by Swiss institutions,

- **To offer Switzerland an opportunity to have a third-generation skills center** characterized by a problem-solving approach rather than access to techniques,

- **To make the shift towards personalized medicine**, representing an opportunity for prevention and health\(^{12}\) promotion as well as for strengthening the position of pharmaceutical leader that Switzerland is,

- **To exploit the potential of the medical technology industry in Switzerland**, which has been reporting a continuous growth of around 6% per year since 2012, which is significantly higher than GDP and other industries in Switzerland,\(^{13}\)

- **To exploit new opportunities and new challenges in the field of diagnostics.** The new opportunities and challenges will arise due to the entry into force of the Swiss Medical Devices Ordinance and the new enforcement provisions on *in vitro* medical diagnostic devices in the first half of 2020 and in 2022.

SICHH and Swiss Smart Diagnostics will ultimately help control health costs, detect diseases early and increase the effectiveness of treatments by choosing the best drugs for everyone.

SICHH, through Swiss Smart Diagnostics, has the ability to develop diagnostic tests for diseases such as cancer, diabetes or cardiovascular and neurodegenerative diseases, the leading causes of death in Switzerland. This will open new paths for disease prevention and integrate prevention into our health care system.

Swiss Smart Diagnostics contributes to maintaining Switzerland’s world leader position in innovation.

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\(^{12}\) Source: Federal Office of Public Health, Personalized Medicine Working Group

\(^{13}\) Source: Swiss Medtech