



Diagnostics State-of-the-art detection

Diagnostics serve to determine whether a specified disease or disease process is present in a living organism and anticipate disease earlier and better. The quality of research and development in the BioAlps cluster encourages innovative start-ups and multinationals alike to work on diagnostics for conditions ranging from celiac disease to HIV/AIDS. Diagnostics is a high growth market, with the global IVD market predicted to grow to US\$ 84 billion by 2023. In Switzerland, 8% of medtech

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manufacturers produce in vitro diagnostics, which represented some US\$365 million in 2015¹. There is rapid growth in new segments including molecular diagnostics, point of care and companion diagnostics².

The BioAlps cluster gathers together the competences and knowhow of many innovative companies which are developing diagnostics for earlier detection of HIV, different cancers, infectious diseases and other conditions. The region is an outstanding place to develop a broad scope of diagnostics ranging from in vitro diagnostics (IVDs), sophisticated technologies performed in clinical laboratories, to simple self-tests, such as for pregnancy. This is

why Aimago and Abionic, two start-up/spin-offs of the Swiss Federal Institute of Technology Lausanne (EPFL) and mid-cap companies like Bracco Imaging have set up in the region. The fast growth rate of diagnostic imaging has led Roche to select Geneva University (UNIGE) as a Centre of Excellence for diagnostic research, aimed at personalized medical diagnosis and treatment, using a translational approach in a strategic partnership including the University Hospitals of Geneva (HUG) and the Swiss Institute of Bioinformatics (SIB).

Using all the resources of Western Switzerland, companies are successfully accessing research, technology transfer, funding, technological knowhow and much more besides. For example, companies and research institutions in the cluster are working on systems that can detect and quantify multiple DNA- or RNA-based biomarkers in a wide variety of patient sample types; biomarkers for hormone dependent cancers; determining unique biomarkers patients' tumors and correlating biomarkers to drug response. In Western Switzerland, convergent technologies are being integrated into the diagnostic sector, with microfluidic chips, biosensors, genomics and advanced diagnostic imaging directed towards developing non-invasive technologies for increased patient comfort.



ABIONIC

Revolutionizing the world of in vitro diagnostics

Founded in 2010 by Nicolas Durand and Iwan Märki, Abionic developed its nano-, bio- and medical- technology within the Swiss federal Institute of Technology in Lausanne (EPFL). Already in 2012, Abionic obtained the ISO 13485 quality certification for research and development, production and marketing of products for the in-vitro diagnostics market. The company's benchmark is winning no less than 20 prestigious startup awards and 4 times best med-tech startup. In 2012, Abionic finalized a Series A financing round and in 2014, a Series B financing for a total of CHF 8.2 million led by MedHoldings SA and including Polytech Ventures & Cie SCPC, Blue Ocean Ventures, Business Angels Switzerland (BAS) and Fongit Seed Invest. The ultra-fast abioSCOPE, a CE-marked reading system designed to detect allergies, received the «Swiss Excellence Product» award in 2013 and the world's fastest blood test diagnostic platform that detects killer SEPSIS, filled FDA registration in 2017, brings nanotechnology directly to healthcare professionals for everybody's wellbeing.

¹ European IVD Market Statistics Report 2015

² <http://www.fightingdrugfailure.net/fightingdrugfailure/partner-sites/lab21/the-global-diagnostics-market.html>

A RICH ENVIRONMENT FOR DEVELOPMENT

Western Switzerland offers a robust array of business and academic institutions with leading technologies and research in the field of diagnostics, whether IVD, diagnostic imaging or molecular diagnostics. Academic laboratories and companies cross-fertilize successfully to create a dynamic, entrepreneurial environment to push the boundaries of knowledge.

The lists below are non exhaustive and showcase some examples of the work being done in the region.

Find more information in our extensive databases: www.bioalps.org/database and, for the six Alpine regions, www.alpslifesciencesearch.com

THE LEADING ACADEMIC DIAGNOSTICS RESEARCH IN WESTERN SWITZERLAND

Geneva University UNIGE & Geneva University Hospitals HUG & Swiss Bioinformatics Institute SIB	Department of Genetic & Laboratory Medicine and Laboratory Medicine service	Diagnostic imaging, neurodiagnostics cytopathology, genetic diagnostics, molecular diagnostics New medical diagnostics based on biomarkers, human toxicology and bioinformatics	www.medecine.unige.ch
Geneva University UNIGE & Geneva University Hospitals HUG in collaboration with the Swiss Federal Institute of Technology Lausanne EPFL	Institute of Molecular Imaging	Translational molecular imaging or animal imaging, nanotechnology, radiation chemistry, and modeling and focus on neuro-imaging, chronic diseases, neurological degeneration, and aging	dmgl.hug-ge.ch/
University Hospital of Lausanne CHUV	Institute of Microbiology	Microbiology diagnosis of infectious diseases	www.chuv.ch/imul
Swiss Federal Institute of Technology Lausanne EPFL & Geneva University UNIGE	Medical Image Processing Lab	Interface between signal processing and medical imaging, signal and image processing and functional imaging. Diagnostic microbiology	miplab.epfl.ch
Swiss Federal Institute of Technology EPFL	School of Engineering Institute of Microengineering Laboratory of Microsystems	BioMicrosystems - Microfluidic, lab-on-a-chip, BioMems - for handling, analysis and culture of biological cells	lmis4.epfl.ch
Centre Suisse d'Electronique et de Microtechnique CSEM	Nanotechnology & Life Sciences	BioMicrosystems – integrated biosensing and monitoring biomechanics, micro-cell reactors, toxicology, biofunctional surface engineering	www.csem.ch/site
	Biosurface Engineering	BioMicrosystems – ion-selective sensing, immunosensing, electrochemical sensing	
	Laboratory Instrumentation & Automation	BioMicrosystems – microfluidics, liquid handling, cell handling, sensor integration, robotics and automation	
University of Applied Science – Western Switzerland HES-SO Valais	Institute Life Technologies	In vitro medical diagnostic (IVD) systems of molecular (nucleic acid, PCR) and immunochemistry (peptides, proteins) based platforms	itv.hevs.ch
University of Berne UNIBE	Institute for Veterinary Bacteriology Diagnostic Laboratories of the Vetsuisse Faculty	In vitro diagnostic pathology including necropsies and biopsies of pet and food animals as well as exotic animals, wild life and fish	www.vetsuisse.unibe.ch
University of Berne UNIBE	Department of Chemistry and Biochemistry	Genetic diagnostics using excimer- based molecular beacons and molecular diagnostics using molecular probes for the detection of homopurine sequences	haener.dcb.unibe.ch
University of Applied Science – Western Switzerland HEIG-VD	BioEngineering Group	BioMicrosystems - biochips Diagnostic imaging: Image processing and visualization	www.heig-vd.ch/international

NON EXHAUSTIVE LIST OF INNOVATIVE DIAGNOSTICS COMPANIES IN THE BIOALPS CLUSTER

ABCDX	Molecular Diagnostics	Neuroscience POC	www.abcdx.ch	INVIVOSWISS	In Vitro Diagnostics	Drug Development	www.invivoswiss.ch
ABIONIC	In Vitro Diagnostics	Allergy	www.abionic.com	LINKAGE BIOSCIENCES	Molecular Diagnostics	DCR	www.linkagebio.com
AUGURIX	In Vitro Diagnostics	Healthcare POC	www.augurix.com	NEOGENOMICS	In Vitro Diagnostics	Oncology	www.neogenomics.com
BRACCO IMAGING	In Vitro Diagnostics	Healthcare	www.braccoimaging.com	NOVADAQ	Imaging Diagnostics	Healthcare	www.novadaq.com
DIAGNOPLEX	In Vivo Diagnostics	Cancer	www.diagнопlex.com	SEYONIC	BioMicrosystems	BioMems	www.seyonic.com
DIAMED	In Vitro Diagnostics	Blood	www.diamed.ch	UNILABS	Molecular Diagnostics	Healthcare	www.unilabs.ch
ERIB LTD	Molecular Diagnostics	Healthcare	www.eribch.com	XSENSIO	BioMicrosystems	Healthcare	www.xsensio.com

The fact sheet provides a view of the key players in the sector at any given time; it is not comprehensive and is subject to regular updates. This current edition was updated in Spring 2018.