



## Neurosciences

### Pushing the boundaries of knowledge

Neurosciences encompass the study of the nervous system, and various technologies and treatments ranging from diagnostics, surgical tools, devices, computer-assisted technologies to drugs. Brain-related illness generates more healthcare related costs and lost income than any other area of health: an estimated US\$ 2.0 trillion annually worldwide<sup>1</sup>. The global neurology devices market is the fastest growing segment among the top device sectors, which is set to grow at 6.1 percent per year to US\$7.3 billion<sup>2</sup>. In Switzerland, neurology drugs represented nearly 17% of overall pharmaceutical sales in the country in 2011<sup>3</sup>.

**WESTERN SWITZERLAND HAS ATTRACTED WORLD-RENOUNDED RESEARCHERS WORKING ON CUTTING EDGE RESEARCH, IN MOLECULAR NEUROSCIENCES AS WELL AS IN MAN/MACHINE INTERFACES.**

The Swiss National Science Foundation (SNSF), working at the interface between research institutions and industry, is supporting two National Centres of Competence in Research (NCCR) housed in our BioAlps cluster: NCCR Synapsy<sup>4</sup> and NCCR Affective Sciences<sup>5</sup>. Furthermore, 150 research groups contribute to the area's attractiveness. They benefit from

state-of-the-art research facilities and platforms, and are trying to push the boundaries of knowledge to understand the mysteries that neurosciences represent.

Western Switzerland has attracted world-renowned researchers working on cutting edge research, in molecular neurosciences as well as in man/machine interfaces. Leading academic institution Ecole Polytechnique Fédérale de Lausanne (EPFL) has an institute devoted to the neurosciences, the Brain Mind Institute, housing the Blue Brain Project, which the European Commission selected as one of its two Future Emerging Technology (FET) Flagship projects with more than CHF 1.5 billion invested over 10 years. The Human Brain Project federates 80 European and international research institutions and will provide new tools to help understand the brain and its fundamental mechanisms, and apply this knowledge in future medicine and computing.

The BioAlps cluster comprises a wealth of start-up and multinational companies active in the neurosciences, spanning many disciplines and technologies. Medtronic, one of the first companies to market deep brain implants, has its European headquarters in Tolochenaz, Vaud.

<sup>1</sup> Neurotech Cluster 2010 report

<sup>2</sup> [www.swiss-medtech.ch](http://www.swiss-medtech.ch)

<sup>3</sup> Interpharma, Pharma Markt Schweiz 2012

<sup>4</sup> [www.nccr-synapsy.ch](http://www.nccr-synapsy.ch)

<sup>5</sup> [www.snf.ch/en/funding/programmes](http://www.snf.ch/en/funding/programmes)



### **PREXTON THERAPEUTICS DEMONSTRATES THE BIOALPS CLUSTER'S DYNAMISM**

*Prexton Therapeutics was the first spin-off company resulting from Merck Serono's R&D portfolio in the field of Parkinson's disease and other brain disorders. The company was set up in the summer of 2012, with seed funding of €2.1 million. Within six months, PrextonTherapeutics obtained an exclusive option to license and develop metabotropic glutamate receptor 4 (mGluR4) Positive Allosteric Modulator (PAM) drugs targeting Parkinson's disease from Domain Therapeutics SA.*

*Led by François Conquet, co-founder some years ago of Addex Pharmaceuticals, also active in the field of neurosciences, Prexton is building a high quality pipeline of therapeutics for Parkinson's disease, using the extensive facilities and research platforms available in Western Switzerland.*

CROSS-FERTILISATION LEADS TO SUCCESS

The neurosciences benefit from the many disciplines available in Western Switzerland, offering the opportunity to create cutting edge research and convergent technologies. The combined strength of the region’s research institutions, teaching and research hospitals, and technology centres, provide an environment conducive to research and development, with a sharp focus on innovations to bring to world markets.

The lists below are non exhaustive and showcase some examples of the work being done in the region.  
Find more information in our extensive database: [bioalps.org/community/](https://bioalps.org/community/) and, for the six Alpine regions, [alpslifesciencesearch.com](https://alpslifesciencesearch.com)

ACADEMIC INSTITUTIONS AT THE FOREFRONT OF NEUROSCIENCES IN WESTERN SWITZERLAND

Geneva University <b>UNIGE</b>	Faculty of Medicine, Department of Fundamental Neurosciences	Animal models of molecular and synaptic mechanisms in cortex creation and plasticity Functional neuroimaging	<a href="https://medecine.unige.ch">medecine.unige.ch</a>
Geneva University <b>UNIGE</b> & Geneva University Hospitals <b>HUG</b>	Interfaculty Neuroscience Center (Medical Sciences, Psychology and Education Sciences and Sciences) and Geneva University Hospital (HUG).	Cutting-edge research in various fields of neuroscience on the normal or pathological brain and its biological mechanisms, in relation with behavior, both in humans (adults or children) and in animals.	<a href="https://neurocenter.unige.ch">neurocenter.unige.ch</a> <a href="https://hug-ge.ch">hug-ge.ch</a>
Ecole Polytechnique Fédérale de Lausanne <b>EPFL</b>	Brain Mind Institute Blue Brain Project	Molecular neurobiology and mechanisms of brain function and dysfunction. Molecular and cellular mechanisms of synapse and microcircuit function	<a href="https://bmi.epfl.ch">bmi.epfl.ch</a>
	Neuroprosthetics Center	Cutting-edge prostheses and technologies that interface with the brain	<a href="https://cnp.epfl.ch">cnp.epfl.ch</a>
	Laboratory of Cognitive Neurosciences	Study of the functional and neural mechanisms of body perception, corporeal awareness, and self consciousness	<a href="https://lnc.epfl.ch">lnc.epfl.ch</a>
	Harvard Medical School and EPFL joint programme on neuroengineering	Improving quality of life for people with neurological disabilities by creating a pathway from device design (EPFL) to clinical testing (HMS)	<a href="https://hms.harvard.edu">hms.harvard.edu</a>
University of Bern <b>UNIBE</b> and University of Fribourg <b>UNIFR</b>	Faculty of Science and Medicine	Neurodegeneration	<a href="https://unibe.ch">unibe.ch</a> <a href="https://unifr.ch">unifr.ch</a>
University of Lausanne <b>UNIL</b>	Faculty of Biology and Medicine, Department of neurosciences	Neurology and Neurorehabilitation translational research in neurological and neuropsychiatric diseases	<a href="https://unil.ch/fbm">unil.ch/fbm</a>
University Hospital of Lausanne <b>CHUV</b>	Department of clinical neuroscience	Neurology and neurosurgery, psychiatry	<a href="https://chuv.ch/neurosciences">chuv.ch/neurosciences</a>

SAMPLING LIST OF LARGE AND SMALL NEUROSCIENCE COMPANIES IN THE BIOALPS CLUSTER

<b>ADDEX THERAPEUTICS</b>	Allosteric modulators	<a href="https://addextherapeutics.com">addextherapeutics.com</a>	<b>MINDMAZE</b>	Nervo-muscular 3D rehabilitation	<a href="https://mindmaze.ch">mindmaze.ch</a>
<b>ALEVA NEUROTHERAPEUTICS</b>	Implants for deep brain stimulation	<a href="https://aleva-neuro.com">aleva-neuro.com</a>	<b>NEURIX</b>	In vitro neural tissues Neurotransmitter detection	<a href="https://neurix.ch">neurix.ch</a>
<b>DEBIOPHARM</b>	Proteins, peptides, small molecules	<a href="https://debiopharm.com">debiopharm.com</a>	<b>PREXTON THERAPEUTICS</b>	Positive allosteric modulators	<a href="https://prextontherapeutics.com">prextontherapeutics.com</a>
<b>DEPUY SYNTHES</b>	Cardiology, metabolism	<a href="https://depuyssynthes.com">depuyssynthes.com</a>	<b>SANOFI</b>	Neurodegenerative disease, psychiatry, epilepsy	<a href="https://sanofi.com">sanofi.com</a>
<b>GENEURO</b>	Therapeutic monoclonal antibodies	<a href="https://geneuro.com">geneuro.com</a>	<b>SENSARS NEUROPROSTHETICS</b>	Limb neural sensory implantable neuroprosthetic device	<a href="https://sensars.com">sensars.com</a>
<b>GLIAPHARM</b>	Therapeutic, neuroprotective molecules	<a href="https://gliapharm.com">gliapharm.com</a>	<b>TRB CHEMEDICA INTERNATIONAL</b>	Neurological ethical pharmaceuticals and medical devices	<a href="https://trbchemedica.com">trbchemedica.com</a>
<b>MERCK</b>	Neurodegenerative disease; multiple sclerosis	<a href="https://merckgroup.com">merckgroup.com</a>	<b>UCB FARCHIM</b>	Central nervous system pharmaceuticals	<a href="https://ucb.com">ucb.com</a>

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 Autumn 2019.