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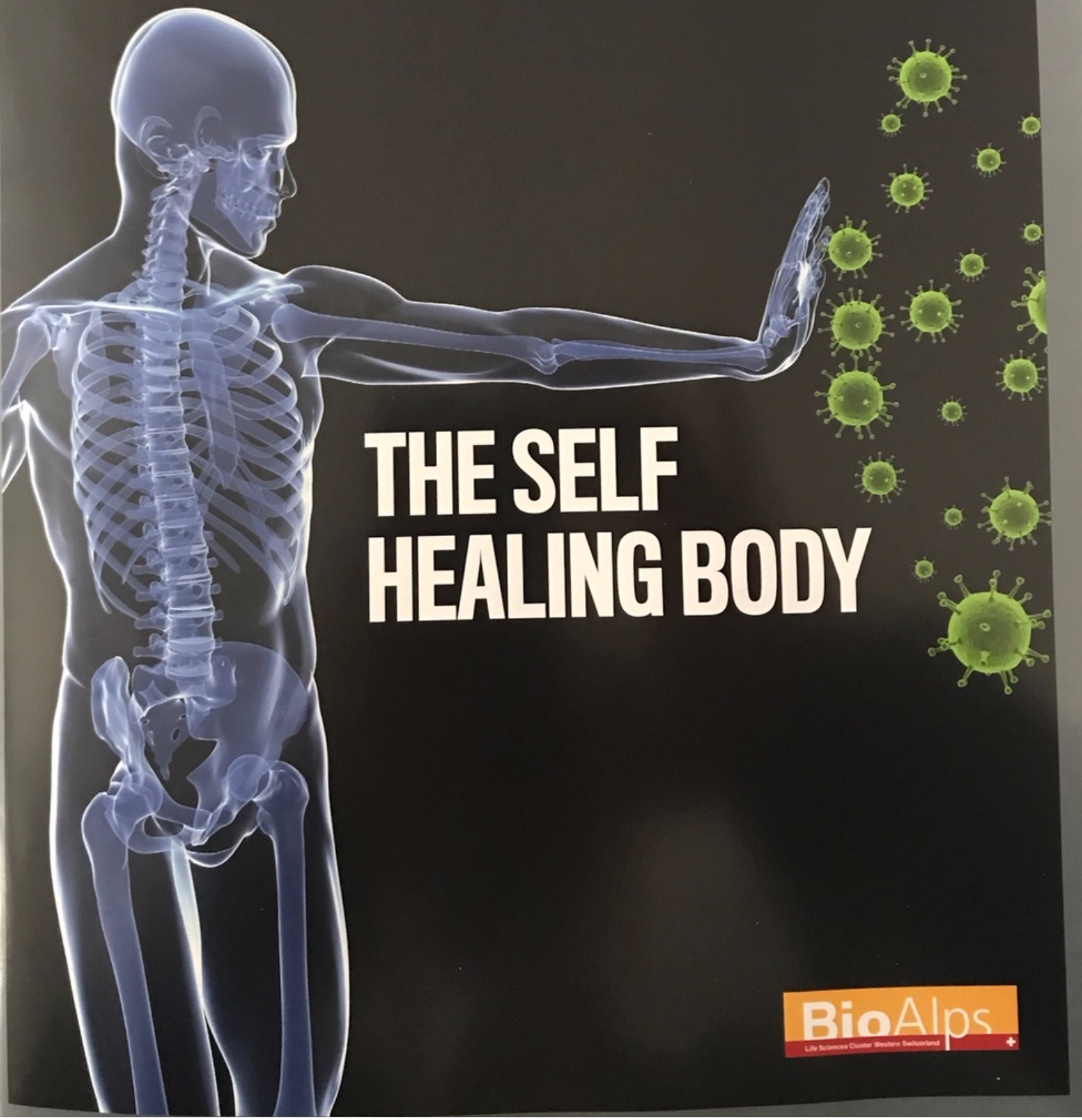
BY Bilan



# THE SELF HEALING BODY

BioAlps
Life Sciences Cluster Western Switzerland

# Biopôle Lausanne: the campus where immunology scales up

A glimpse behind the community model that enables company development and inter-organisational collaboration and innovation.

BY NASRI NAHAS, CEO BIOPÔLE SA

Shaping new products, designing new efficient immunotherapies, introducing nutritional goods to cancer research... these are just few of the inspiring business projects that visitors will find at Biopôle Lausanne. They all attempt to foster research in life sciences and quickly turn it into solutions for patients.

At Biopôle Lausanne, life sciences companies and academic institutions cover, among other things, the vast field of immunology, with an emphasis on vaccines, antibodies, cell therapies and immune modulators. Leading companies include ADC Therapeutics, Novigenix, Anergis, Mymetics, Gnubiotics and Abionic (see box). Though immuno-oncology represents one of the most important research fields at Biopôle, our community members' expertise spans an impressive number of therapeutic areas, fostering increased exchange and cross-fertilisation of ideas. Further, our corporate and academic members are increasingly aware of the need to act as a community to make a difference. Not only do they share costs including access to core facilities, technology platforms and discounted service offers, but, in particular, they also actively build synergies and long-lasting partnerships.

## Multi-discipline to serve innovation

Thanks to the presence of leading research institutes, a lively life sciences industry and a growing portfolio of start-ups, the Health Valley and particularly the Canton of Vaud are a playground for life sciences. Biopôle is at the epicentre of this dynamic region and mirrors the diversity of its stakeholders. Additionally, the campus fosters inter-organisational collaboration that encourages members to learn from each other and come up with novel out-of-the-box solutions. The more pairs of eyes you have looking at a problem, the better the chances of a solution. Because of this community model, whose strength lies in the network, companies can not only develop common business and research projects but, most importantly, can seamlessly liaise to share key learnings and insights.

Nasri Nahas believes in innovation through exchange, experience sharing and proximity.

## Access to potential business and research partners

One of the most important features when getting established on campus and becoming a member of the Biopôle community is the access to the privileged network of industry and academic members of the community. This is easy because of the proximity on site and participation in a variety of networking events organised to help the community stay in touch. We like to think of our role at Biopôle as the enablers of these exchanges and we put a lot of effort into constantly developing additional networking venues, programmes and events to share and challenge research and business insights.

> "Lausanne is the vibrant and growing place to be for innovation in life sciences"

In 2018 two Biopôle companies in the field of immunology, Mymetics Corporation and Anergis, entered into a research collaboration project. The pre-clinical study programme, planned to last until the end of 2019, will evaluate the immunogenicity profile of the Anergis peptides which are designed to treat birch allergy when presented on Mymetics' proprietary virosomes, and will compare the results to Anergis' AllerT product combination. This collaboration perfectly illustrates the community spirit present at Biopôle Lausanne.

In addition, we are especially proud to host leading academic institutes and research groups including the Department of Oncology of the University Hospital of Canton Vaud (CHUV), the Centre of Infection and Immunity (CIIL) of the University of Lausanne and the Ludwig Institute for Cancer Research. In addition, we are near the CHUV medical centre, the Swiss Cancer Centre Léman and the Swiss Federal Institute of Technology (EPFL). The presence of the research laboratories of the Faculty of Biology and Medicine of the University of Lausanne provides opportunities for community members to work near academic and clinical folks, their discoveries and their research platforms.

## Start-ups have a place to experiment and grow

The Swiss Biotech Report 2018 states that while Basel maintains its position as leader for big established pharmaceutical companies, Lausanne is "the" vibrant and growing place to be for innovation in life sciences. This is due, among other things, to a high concentration of start-ups, a unique educational offer in the region, second-to-none infrastructure invested in by the Canton of Vaud and a plethora of supporting institutions and partners. In Switzerland, a serious life

PHOTOS: DR

**Aerial view of Biopôle Lausanne, the growing urban life sciences campus overlooking lake Geneva.**

sciences company can reasonably raise up to 1 million CHF in seed funding. Yet we are all aware of the high level of investment needed to build a laboratory and how discouraging this can be for entrepreneurs who are then often left with the option of staying in their academic laboratories instead of developing their ideas in entrepreneurial set-ups. To create a comprehensive offer to life sciences companies in the Canton of Vaud, Biopôle decided to close the loop and introduce Startlab, an incubator exclusively dedicated to life sciences. How does it differ from the others? Startlab is based on a flexible pay-as-you-play model where all the initial investments have been taken over by Biopôle, thus transforming the majority of our incubated start-ups' fixed costs into variable costs. Start-ups are thus enabled to better allocate their resources and grow in a thriving and inspiring life sciences ecosystem. Meanwhile, investors are reassured that the entrepreneurs are not only coached and accompanied by seasoned entrepreneurs, but can grow and experiment in a safe context while focusing purely on their own business and research. The incubator is physically located at the centre of the Biopôle Campus and allows full integration of the entrepreneurs into the Biopôle community.

### Digital is the new black

After several years attending conferences on the consequences of the digital revolution, it was time to act and create a hub where digitalisation in life sciences can shape future developments. The Biopôle Digital Health Hub gathers together innovative companies that integrate digital technologies into the life sciences sector. With different sectors of operations, it represents a reference for digital integration for the community and a leading think tank to raise awareness in the digital health field. For example, immunology-oriented companies can profit from the experience of the companies working at the Digital Health Hub to fully integrate digital products into their research, patient centricity and business models.

## HOW SOME COMPANIES AT BIOPÔLE LAUSANNE COVER DIFFERENT IMMUNOLOGY AREAS

| abionic | ADC THERAPEUTICS | Anergis | Glenmark | GNUBIOTICS SCIENCES | MYMETICS | novigenix |
|---|---|---|---|---|---|---|
| COMPANIES<br>ABIONIC develops a technology that uses the properties of adsorbed immunoglobulins to specifically recognize biomarkers present in a drop of blood in a nanofluidic setting. | ADC Therapeutics employs monoclonal antibodies specific to tumour antigens conjugated to a novel class of highly potent pyrroloben-zodiazepine (PBD) - based warheads to selectively kill cancer cells. | ANERGIS has developed a set of specific protein fragments that rapidly desensitizes the body towards allergens by efficiently down-regulating exaggerated immune response. | GLENMARK develops bispecific antibodies that help immune cells to get in contact with cancer cells to better fight them. These antibodies are currently tested for breast cancer, myeloma and colorectal cancer. | GNUBIOTICS has developed a set of sugars that specifically feed the good bacteria present in the gut while starving the bad ones, subsequently reinforcing the immune system. | MYMETICS uses modified viral shells to stimulate the immune system without triggering infection as a novel vehicle for vaccination. | Thanks to NOVIGENIX's technology it is possible to detect early phases of colorectal cancer by recognizing a specific gene activation signature of immune cells present in the blood. |
| IMMUNOLOGY AREA<br>Diagnostics | Therapeutics | Therapeutics | Therapeutics | Therapeutics | Therapeutics | Diagnostics |
| FOCUS<br>Allergies/sepsis | Oncology | Allegies | Oncology | Nutrition | Vaccines | Oncology |

# In Western Switzerland immunotherapy is providing the leverage for a massive scaling-up in life sciences

Immunotherapy, which trains T-cells in the body to detect and kill cancer cells, is a growing field in which academic institutions and biotech-pharma companies in Western Switzerland are fast converging. It is creating a forward-looking hub in oncology and beyond.

BY FABRICE DELAYE

## SWISS START-UPS BUILD LEADERSHIP IN PERSONALISED IMMUNOTHERAPIES

Intercepting colon cancer in its earliest stages and years before the appearance of symptoms could help eradicate the disease. From its offices at the Biopôle in Lausanne, Novigenix is developing non-invasive blood tests for early detection of cancer in collaboration with hospitals and clinics in Switzerland.
Its technology platform combines blood transcriptomics with advanced data analysis using machine learning and artificial intelligence to decrypt specific patterns of immune system reaction to the onset of disease. Changes in the expression profile of circulating immune cells that are exposed to tumours can be measured in blood and interpreted as early indicators of cancer.
The first-generation test Colox for detection of colorectal cancer is currently available in Switzerland and a second generation is being developed for global roll-out. Novigenix is also exploring other applications of its technology platform such as patient stratification and monitoring of immunotherapies.

### In search of cancer markers

Lunaphore is a Swiss-based spin-off of the EPFL developing tissue staining devices for cancer diagnostics. It is recognized as one of the most innovative companies nationally and internationally.
Immunostainings are widely used biomarker tests which reveal presence of relevant cancer markers through coloration of tissue samples. Nowadays, techniques called multiplexing, allow testing several markers on the same sample to get a full understanding of how immune cells interact together against cancer.
Immunophenotyping is key to understand each case and offer patients personalised therapies. Lunaphore is developing a technology based on a microfluidic chip which aims to perform those tests much faster and with higher precision than standard techniques. Ultra-rapid multiplexing may enable same-day patient cases, with better outcomes. With its first product to be launched in the upcoming months, Lunaphore's vision is to bring cutting-edge solutions to the tissue cancer diagnostics field. (FD)

With biologicals such as man-made proteins, immunotherapies stimulate the immune system to work harder or smarter to attack cancer cells.

One of the main reasons cancer cells thrive unchecked is that they are able to hide from the immune system. So, certain immunotherapies mark cancer cells to make it easier for the immune system to find and destroy them. Others boost the immune system to work better against the cancer. In all cases, they help the body to heal itself.

Today there are several types of immunotherapies used to treat cancer. Checkpoint inhibitors work by releasing the brakes that keep T-cells – a type of white blood cell – from killing cancer cells. Adoptive cell transfer is a treatment that attempts to boost the T-cells' natural ability to fight cancer. Finally, monoclonal antibodies are immune system proteins created in lab. With targeted therapies they are designed to attach to specific targets found on cancer cells and stop them growing. But some monoclonal

**Monoclonal antibody, Avemulab is approved since March 2017 for Merkel-cell carcinoma.**