Established in 2013, the Swiss Institute for Regenerative Medicine (SIRM) is still in its infancy. Why was it created and what developments have been made so far?

The idea for SIRM was actually the result of experience gained over the last 12 years from the research team led by Professor Dr med Tiziano Moccetti at Cardiocentro Ticino – an important heart clinic based in Lugano, Switzerland, which in 2012 became an Associated Institute with the University of Zurich. Cardiocentro was the main founding institution of SIRM, which was ultimately created in response to the pressing demand to have a structure entirely dedicated to research in the broad field of regenerative medicine in Ticino, and to push both research and the adoption of new therapies.

To build a research institute from scratch is not a simple task. However, just two years after its formation, SIRM is equipped with 19 new and highly specialised infrastructures – a number that is expected to grow in the near future as demands for new partnerships, spaces and infrastructures continue to rise.

What is your role within the Institute, and what skills and experiences do you bring to the table?

As a biomedical engineer, the SIRM project fascinated and excited me from the outset. The prospect of creating something completely new in the highly innovative and revolutionary world of regenerative medicine is highly motivating – and it is extremely rewarding to work on this fantastic project.

The medicine of the future, and regenerative medicine in particular, uses a different language to that which has been used traditionally. It arises from a unique meeting point of biology and medicine – and its potential is realised through the application of methodologies and technologies that are very similar to the tools traditionally used by biomedical engineers.

The Institute is based in Lugano. Can you explain why you specifically chose this location?

Lugano is an international city and the economic capital of Switzerland’s Canton Ticino region. With two university campuses, it already has a mature academic and cultural context. In addition, Lugano is a converging point for medical treatment and research, containing the largest medical centre in the region, and within a 20 km radius there are three public hospitals, six private clinics and two specialist centres focused on neurological and heart diseases.

What is your vision for the future?

The success we have seen in recent years with the SIRM initiative demonstrates that there is rapid growth within the Life Sciences. Our idea is therefore to extend the winning formula already tested by SIRM, creating a new ‘enabling infrastructure’ available to researchers and businesses alike, in order to encourage growth and support the broader development of medical and biotechnology industries.

To achieve our vision, we are going to buy more than 13,000 m² of property in the centre of Lugano, which will house SIRM and our partners. The entire project, provisionally entitled ‘Lugano MedTech’, is supported by a vast network of institutional and scientific players. The City of Lugano – which immediately believed in our project – is also an important participant on an economic level.

By what means are you encouraging potential investors and new institutes that might be interested in opening an R&D department in Lugano MedTech?

Universities, federal polytechnics and other academic institutions from Switzerland can take advantage of the opportunities offered by our Institute to open hubs or transfer research groups that wish to establish research collaborations with the new Faculty of Biomedicine to our premises.

For international research institutes, collaboration within MedTech could encourage the creation of new international research projects. To these companies, Lugano MedTech offers spaces, offices, services and infrastructures. However, the biggest added value are the services that we offer to speed up the process of research and incubate new economic realities.

Furthermore, both our Grant and Intellectual Property offices will be available to all affiliates of Lugano Medtech, which will also offer several other services that are currently under investigation.

Antonino Tramonte is a biomedical engineer who is passionate about the emerging opportunities in the field of regenerative medicine. Speaking as Managing Director of a new Switzerland-based research institute, he outlines the achievements made to date and the plans for the future.

The medicinal revolution

www.internationalinnovation.com
The medicine of tomorrow, today

Regenerative medicine has the potential to completely revolutionise treatments for a wide range of diseases. The Swiss Institute for Regenerative Medicine, which hosts a young, collaborative and multidisciplinary group of researchers, intends to be at the forefront of developments in this rapidly expanding field.

Regenerative medicine can be defined as the process of replacing or regenerating human cells, tissues or organs to restore or establish their normal function. Only a few decades ago, this concept was firmly restricted to the realm of science fiction; however, in a very short space of time, it has become a tangible scientific reality.

Regenerative medicine relies on the use of stem cells, which are found in most tissues in the human body. As undifferentiated cells that perform replenishment and repair functions, stem cells can differentiate into many different kinds of specialised cells. In 2014, more than 60,000 stem cell transplants were performed to treat cancer and blood diseases — and the number of patients treated with experimental therapies exceeded 200,000. Both of these figures are expected to rise dramatically in the foreseeable future.

Curing the incurable

Most tissues and organs in the human body have a regular turnover of cells, meaning that entire tissues or organs are replaced over a period of weeks or years depending on the cells in question. However, there are some exceptions to this so-called turnover effect.

The heart is one such exception. Adult cardiac cells experience no (or extremely slow) replacement over time. While there is some debate in the scientific community about the extent of this replacement, it is generally accepted that there is less than one turnover of heart cells throughout the course of an average person’s lifetime. Thus any injury to the heart has grave consequences for the patient.

Heart attacks are caused by blocked arteries, which prevent the flow of oxygen-rich blood from reaching the heart. Without rapid intervention, the oxygen-starved cells in the heart quickly die — and, because the human body cannot repair the damaged region of the heart, any damage is considered permanent in traditional medicine. Even if the patient survives, they will be at high risk of heart failure for the rest of their life.

In 2004, under the leadership of Professor Dr med Tiziano Moccetti, the Cardiocentro Ticino — a specialist heart clinic in Switzerland — carried out the country’s very first stem cell transplant on an infarcted heart. This pioneering treatment delivers stem cells to the damaged region of the heart, where they differentiate into cardiac cells, undoing the damage that was previously considered irreversible.

Heart disease is just one example of a condition that could be completely revolutionised by regenerative medicine. Other potential applications of regenerative medicine are found in Parkinson’s disease, cerebral palsy, degenerative retinal diseases, pulmonary disease, spinal cord injury, arthritis and many more. Indeed, today there are over 200 ongoing phase III clinical trials involving stem cell-based therapy worldwide.

The Swiss Institute for Regenerative Medicine

Founded by Cardiocentro Ticino and the Foundation for Cardiological Research and Education (FCRE), the Swiss Institute for Regenerative Medicine (SIRM) was officially opened in 2013. Based in Lugano, Switzerland, SIRM is the country’s first organisation dedicated solely to regenerative medicine. It was felt that there was a need for a stronger focus on regenerative medicine in Ticino Canton – the Italian-speaking region in southern Switzerland – and that the Institute would benefit from the existing strong medical research culture in this region.

The mission of SIRM is to highlight the central importance of stem cells, together with both intellectual and financial investment,
through research and knowledge of cellular and molecular biology. In addition, it aims to develop technologies and devices to support this research,” shares Antonino Tramonte, Managing Director of SIRM.

Although it is still a young company, SIRM already participates in a number of collaborations. Key among these is its association with the University of Applied Sciences and Arts of Southern Switzerland (SUPSI), which is also based in Lugano. In addition to SUPSI, SIRM has partnerships with four other institutions, including Cardiocentro Ticino, as well as the Swiss Stem Cell Bank and 11 research groups currently comprised of 52 researchers.

Excitingly, SIRM has started a technology transfer project on resident cardiac stem cells, together with a research group at Harvard Medical School in Boston, USA. Future goals for SIRM include gaining more academic affiliations, increasing the output of high-quality publications and seizing opportunities to explore new fields and launch innovative projects with its network of scientific partners. SIRM is also actively seeking new collaborators to fill the Lugano MedTech research park and expand an already extensive clinical research network. “The Lugano MedTech ship has not yet set sail, but there are already good reasons to get on board,” Tramonte concludes.

THE FUTURE OF MEDICINE
In view of the great successes it has had to date, SIRM can afford to make ambitious plans for the future. It has already completely filled its current headquarters and state-of-the-art facility – and its 19 specialised infrastructures include one of only five stem cell factories in the whole of Switzerland, which has a capacity to produce 12 batches of stem cells simultaneously.

At SIRM, preparations are now under way to move to a facility located in the centre of Lugano, which is eight times larger than the current one. “Provisionally named Lugano MedTech, it will host SIRM, independent research institutes, R&D departments of biotech companies active in the region, a business incubator and research departments of some of the most important Swiss universities,” Tramonte says.

FUNDING
Swiss National Foundation (SNF) • Commission for Technology and Innovation (CTI) • National and international institutions; foundations; individual donors; private banking; philanthropic services

CONTACT
Antonino Tramonte
Managing Director
Via ai Söi 24
6807 Taverne – Torricella
Switzerland
T +41 918 053 976
E nino.tramonte@sirm-institute.ch
www.sirm-institute.ch

ANTONINO TRAMONTE has many years of experience in project management. He leads effective sales and marketing initiatives to drive business and is passionate about listening to the needs of customers. Dedicated to ensuring excellent products and services, he also has a wealth of experience in the installation of biomedical equipment.