ISSUE 46
MARCH 2015
www.temis.org

TEMIS news

BESANÇON - FRANCHE-COMTÉ - FRANCE

Innovation
for healthcare

Editorial

Every day, our competitiveness cluster demonstrates that the microtechnology expertise of Franche-Comté is used in a host of products and processes.
Household and industrial robots, smartphones, Pay & Display machines, information systems for users of mass transit and surgical instruments are just some of the applications for microtechnology.
The list above makes it possible to better grasp the development potential of our businesses and that of research in our laboratories of excellence, which opens many vistas and opportunities for our students.

The authorities of the TEMIS science and industrial estate work with those involved in training, research and industry to anticipate their needs and prepare the future.
With the delivery of the BIOPARC 2 building in TEMIS Santé, the first stage of our business property programme devoted to biomedical activities has just been finalised. A second stage is under preparation to support and serve the research and innovation strategy deployed by healthcare specialists in the areas of medical devices and biotherapies.

In TEMIS Microtechnique, the FEMTO-ST Institute is now fully operational in its new premises in rue Savary. ENSMM and ISIFC develop their training courses in direct collaboration with the businesses of the region and beyond.
The incubator and company nursery of TEMIS nurture new talents and thus produce future generations of entrepreneurs.

That combination of public and private initiatives is what makes the wealth and reputation of our territory. We will continue to support freedom of enterprise as a fundamental value that serves the creation of jobs and prosperity.

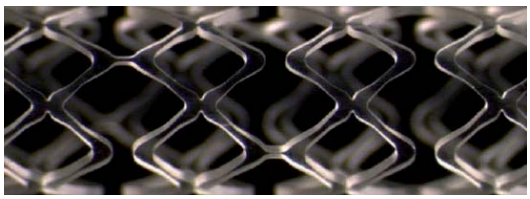
Jean-Louis Fousseret,
Mayor of Besançon
President of Temis and Grand Besançon

Research & innovation: the regional university hospital of Besançon sets the standards

ART: a new generation of bio-resorbable stent

TEMIS BESANÇON
TECHNOPOLE MICROTECHNIQUE & SCIENTIFIQUE

ART DEVELOPS THE SECOND GENERATION OF BIO-RESORBABLE ACTIVE STENTS



Arterial Remodeling Technology (ART), specialist of bio-resorbable coronary endoprostheses, came to TEMIS in 2008. After developing a first generation of stents in a clinical study with some thirty patients and very satisfactory results at 18-24 months, the company is developing a **new generation of stents that are bio-resorbable and active, i.e. capable of delivering medicines**.

ART has developed considerably in recent years and its now employs 12 staff in Besançon. To address its growth needs, the company has moved into **new premises** in TEMIS, where it has acquired a **second clean room**.

"*In March 2014, we entered into a partnership with the Japanese group TERUMO to develop a new generation of stents that are bio-resorbable and active, for treating coronary conditions*", explains Sophie Humbert, Director of Operations of ART. "*With TERUMO, we are uniting our know-how of innovative resorbable stents with their know-how of medicine coating. To carry out the work, four Japanese engineers are based with us*". Besides, Sophie Humbert is happy to enjoy the support extended by BpiFrance Franche-Comté* for the continued development of the company.

Contact: Sophie HUMBERT,
Director of Operations of ART
Email: sophie.humbert@art-stent.com

** BpiFrance Franche-Comté manages the regional fund for support to innovation set up by the local region and départements and the Grand Besançon conurbation to support all innovative work. BpiFrance Franche-Comté contact details: +33 (0)3 81 47 08 30*

Delivered in December 2014, supported by ERDF. Manufacturer: LCR

BIOPARC 2 DELIVERED

Using the successful formula of the first BIOPARC, which is home to 7 companies employing close to 70 staff, BIOPARC 2 proposes rental solutions for medical and biomedical businesses using high technology. The 1600 m² building made and marketed by AKTYA already contains a cytopathology laboratory.

Designed for labs

The building is designed for laboratories or clean rooms, with appropriate ceiling height (3.18 m), perimeter removal systems and the required technical ducting. Each level is a basic space designed as a free area with as few intrusive bearing structures as possible, to allow modular designing and make layout easier.

1 000 m² available

Between the ground floor and the first floor, two spaces with useful areas of 520m² remain available for fitting out in BIOPARC 2. This energy efficient building (43 kWh PEC/m²/year) uses advanced technology that allows its occupants to tightly control their costs. Underground parking spaces are also available.

With its infrastructure, special equipment and environment dedicated to training, research and innovation in healthcare, **TEMIS** is building a true **cluster** for the **medicine of the future**. In order to support the dynamic specific to biotherapies and medical devices, Grand Besançon has the ambition to deploy, by 2017, a **platform of services and projects** named **BIO INNOVATION**.

Contact: Gilles PÉTREMENT, SedD
Tel. +33 (0)3 81 41 86 69 • Email: g.petrement@sedd25.fr

PHOTLINE: PROJECT PROGRESS

Photline, the iXFiber photonics solution division of the iXBlue group, a European player in fibre optics, will set up operations in the technology park in August.

Work on the new building has started. The project owner is AKTYA, and the 2500 m² building will be built by the GA group.

Contact: Henri PORTE,
CEO of Photline Technologies
Tel. +33 (0)3 81 85 31 80
www.photline.com

RESEARCH AND INNOVATION IN HEALTHCARE: THE REGIONAL UNIVERSITY HOSPITAL OF BESANÇON SETS THE STANDARDS

Whether it is for the next clinical trials for the first cancer therapy vaccination, the intelligent transfusion control device or the new microsystem integrated into an endoscope for robotic surgery of the vocal cords, the research teams in Besançon have made their regional university hospital one of the leading establishments in terms of innovation for healthcare.
Interview with Macha Woronoff-Lemsi, Vice-President, Research of the Hospital

Over 200 professionals at work

"110 research engineers work here every day to support some hundred practitioners from the hospital and the university, who are engaged in healthcare research. Currently, 163 research projects are under way, about ten of which are international in scope, including the transfusion research project we are pursuing with Canadians and the local blood bank or that for resuscitation, where we work with Australian researchers".

Three broad strategic areas

*"Research is organised here in three strategic areas. The first is **Biotherapies**, which is based on subjects that are being developed for a number of years and was recognised by the founding, in 2005, of the Clinical Investigation Centre approved by INSERM and the Ministry for Health. In this area, we are working on the development and evaluation of biotherapies for onco-haematology, transplants, inflammatory conditions and also assisted reproductive technology.*
*The second area is that of **Medical progress and social development,** where we work, in particular, with the staff of the Chrono-Environment laboratory of the University. This area addresses vulnerability and risk. Programmes are developed in the areas of infectious and microbiology risks, cardio-neuro-vascular risks, addictions and ethics.*
*The third area is that of **Technological innovations**. It relies on the particularities of Franche-Comté and the excellence of its microtechnology industry. Here, we work closely with the staff from FEMTO-ST on microsystems and bio-logical qualifications, technologies for neuropsychiatric health and issues relating to mobility and independence."*

Closeness for effectiveness

"One of the strengths of research in our hospital is derived from our position in a policy of close sites, with the University, CNRS, INSERM, ISIFC etc. We thus have a particular ability to act quickly and to identify the right contact in no time.
Recently, while responding to an international call for tenders, we were able to complete our offer in three weeks. That is impossible in very large hospital centres. It is an example of the true strengths of research in Besançon".

RESEARCH AND INNOVATION AT THE REGIONAL HOSPITAL IN FIGURES (2013)

- 163 research projects promoted by the regional hospital
- 738 open studies promoted by the pharmaceuticals industry and institutions
- Two national centres of reference: the WHO collaboration centre and the Clinical Investigation Centre (CIC)
- 1st tumour register put in place in 1976 (100,000 cases listed)
- Over 15,000 samples in the tumour library

ENDOSCOPIC MICROROBOT FOR LASER MICROSURGERY OF THE VOCAL CORDS: THE FIRST EUROPEAN PROTOTYPE HAS PASSED PRE-CLINICAL TRIALS

As part of the European project named **µRALP**, the FEMTO-ST Institute and the hospital, along with their partners, presented the endoscopic robot for vocal cord surgery at the end of February. This first European prototype for such surgical procedures has passed pre-clinical tests.

Quality, precision, affordability and comfort

Currently, whether it is for removing tobacco-related cancer damage or benign lesions, surgeons use a microscope and a laser with a source located 40 cm away from the patient's mouth. In such conditions, the surgeon must be precise and steady. As for the patient, the position with the trachea entirely extended is uncomfortable and generates post-operative pain that is fairly significant. **The device developed by the consortium makes it possible to bring the laser to 20 mm from the vocal cords**. With cold lighting, two miniature cameras for 3D vision, two lasers and a 1 cm^3 microrobot, the endoscope is guided by the surgeon using visual feedback. The combination of technologies makes this endoscopic microrobot a great source of hope for patients.

Three countries, five institutions

The **µRALP** project required three years' research and € 3.6 million, of which € 2.65 million were funded by the European Union.
Sponsored by the Italian Institute of Technology (IIT), it brings together the regional university hospital of Besançon and the universities of Genoa and Hanover. At Femto-ST, the MiNaRoB team particularly designed several innovative solutions for the laser micro-manipulator. As for the PIM team, it was involved in the fluorescence imaging part. At the university hospital of Besançon, the ENT department and the Centre for clinical investigation took part along with their Italian counterparts in the definition of the specifications and the medical and regulatory requirements of the project. The hospital teams have also put in place an ex vivo clinical trial. After the stage of pre-clinical tests on cadavers, at least three more years will be required before the equipment and protocol are fully developed and validated.

Contact: Sophie MURACCIOLI
Communication manager at the hospital
Tel. +33 (0)3 81 21 86 26
Email: s1muraccioli@chu-besancon.fr

in brief

A unique solution **for each of your surface metrology devices**

Digital Surf, supplier of software to the leading manufacturers of microscopes in the world, released its Mountains® concept in 1997. In a few years, Mountains® has been gradually taken up by almost all profilometer manufacturers, from USA to Japan. Version 7 of Mountains is now **the most complete surface analysis software in the market**.

"*With the new version of Mountains®, we are the only company in the world to offer specialist analysis software that is relevant for each large family of microscopes*", says Christophe Mignot, Manager and Founder of Digital Surf.

"*The previous version already covered the surface analysis needs of touch and optical profilometers, near field microscopes such as atomic force microscopes or electronic scanning tunnelling microscopes. With version 7, we now also cover the needs of optical microscopes, Raman type spectrum analysis microscopes, and above all scanning electron microscopes (SEMs), where Mountains® 7 makes it possible to turn a flat image into a 3D image*".

Find out more: Christophe MIGNOT
Email: contact@digitalsurf.fr

Mountains® 7 is a unique solution for all the surface metrology devices of an entire site: interferometry microscopes, confocal microscopes, profilometers, near field microscopes, SEMs, optical microscopes, spectrometers etc.

Surface reconstruction in 3D from 4 images (SEM) representing toner particles. Made with the new version of Mountains.

An environmentally-friendly solution **to replace polluting oils**

Fruit of collaboration between institutes of the University of Franche-Comté, UTINAM and FEMTO-ST, and partnership with the company APERAM, the start-up AFULub that has joined the incubator will offer industry environmentally-friendly solutions for the forming of materials. While its alcohol solution offers performance comparable to that of the best petrochemicals oils, it also addresses current environmental concerns. After semi-industrial testing, it was demonstrated that AFALub is not only a solution that is suitable for replacing oils that pollute from the tribology viewpoint, but is also a simple and fast application that does not harm the tooling, is environmentally responsible and does not call for any post-treatment cleaning.

Find out more: Fabrice LALLEMAND • Email: fabrice.lallemand@univ-fcomte.fr

to be_continued

ISIFC exports its know-how

With its new international master's degree in biomedical engineering, ISIFC is scheduled to start spreading its know-how in other countries, particularly Kazakhstan, from next year.
This career-oriented course is only for foreign students. In two years, it covers the core speciality of ISIFC, namely training in biomedical engineering.

Find out more: Jean-Marie CROLET, Research Manager at ISIFC
Tel. +33 (0)3 63 08 25 82

_Reminder

MEDTEC France 2015, The leading French-speaking event of the medical device industry will be held on 10 and 11 June 2015 in Besançon

The main players of the medical devices industry will be in Besançon for the **7th edition of MEDTEC France**. Leading French meeting place for medical devices, combining conferences and exhibition, MEDTEC France encompasses all the technologies and skills in the medical device sector. Over 200 exhibitors are expected, from global leaders to specialised suppliers, all experts of medical devices.

More information at www.medteceurope.com

The Hotel/Restaurant Oxalys has changed names and is now le Vesontio

Open from Monday to Friday, for lunch and dinner
Book in advance for weekends

3 Chemin des Founottes
Tel./Fax: +33 (0)3 81 80 41 41

TEMIS BESANÇON
TECHNOPOLE MICROTECHNIQUE & SCIENTIFIQUE

TEMIS NEWS - March 2015 • www.temis.org • Editor: Jean-Louis Fousseret • Contact: Bruno Favier • Tél. +33 (0)3 81 50 46 95 • E-mail: bruno.favier@temis.org • Technology Park management - 18, rue Alain Savary - 25000 Besançon, France • SedD Marketing: Tel. +33 (0)3 81 41 86 69 - Fax: +33 (0)3 81 41 46 51 • Pictures: DR - Ludovic Godard - UFC, Digital Surf, Olivier Perrenoud, ISIFC • Design, Content and Production: JC. AUGÉ • ISSN no.: 2110-1051.