

CEA-Leti and 7 Partners to Study Ways to Improve Treatment of Inflammatory Bowel Disease

Goal Is to Develop Nanocarrier for Targeted Delivery of Corticosteroids and Immunosuppressants

GRENOBLE, France – April 11, 2011– CEA-Leti today announced a new project designed to develop a novel nanocarrier-based approach to improve the treatment of inflammatory bowel disease, and increasingly common condition in Europe.

The Delivering Nano-pharmaceuticals through Biological Barriers project, known as BIBA, involves eight partners in France, Germany, Spain and Switzerland. BIBA is coordinated by CEA-Leti as part of its research program on organic nanocarriers and delivery systems for clinical applications like molecular imaging and drug delivery.

The three-year study is designed to develop an anti-inflammatory corticoid and/or an immunosuppressant encapsulated within a biodegradable nanocarrier for improved treatment of IBD and reduced side effects. Industry supervision of the preclinical proof of concept will enhance quality control to guaranty a faster regulatory application after the project.

Inflammatory bowel disease (IBD) includes Crohn's disease (CD) and ulcerative colitis (UC). Medical treatment of IBD is mostly based on the use of corticosteroid to induce remission and of an immunosuppressant to prevent relapses. But these approaches are inefficient in more than 70 percent of patients with CD, and 20 percent of the patients with UC who ultimately require surgery for control of the disease. Corticosteroids like prednisolone can induce remission in a high proportion (60-80 percent) of patients.

However, the required doses of steroids cannot be administered long-time due to adverse events. BIBA will investigate local delivery of encapsulated corticosteroids and immunosuppressants using two types of organic biodegradable nanocarriers to prevent side effects. Passive targeting of nano-delivery systems in inflamed tissues exploiting the so-called enhanced permeability and retention (EPR) effect is expected to increase the local concentration of corticoids in inflamed areas.

One model of corticoid, budesonide, and one model of immunosuppressant, cyclosporine, will be separately encapsulated in three dosage forms – oral, colonic, and intravenous – to maximise the delivery of anti-inflammatory drugs through the gastrointestinal tract, with two nanocarriers: lipid "baby bubbles" (Lipidots®) and poly(lactic-co-glycolic acid) (PLGA) particles. In vitro experiments will be performed on a lab model of healthy and pathological epithelium to screen the most relevant nano-pharmaceuticals.

Formulations will then be evaluated in vivo in appropriate rodent colitis models. Animal models allow both the examination of inflammatory processes (both early and late events) as well as the evaluation of new therapeutic modalities. Non-invasive magnetic resonance imaging (MRI) and optical fluorescence in combination with histological analysis will be used to monitor the effect of the therapy on the inflamed mucosa.

The BIBA study is funded by the European programme ERANET EuroNanoMed. Leti's partners in the project include:

- Helmholtz-Institute for Pharmaceutical Research Saarland, Saarbrücken, Germany; and PHAST Gesellschaft für Pharmazeutische Qualitätsstandards mbH, Homburg, Germany
- Institut Albert Bonniot, INSERM-UJF U823, Grenoble, France
- Two Spanish hospitals: Instituto de Investigación Sanitaria La Paz, Madrid; and Institut Investigacions Biomèdiques August Pi i Sunyer, Barcelona; and the
- Institute of Anatomy of the University of Zurich

About CEA-Leti

CEA is a French research and technology organization, with activities in four main areas: energy, information technologies, healthcare technologies and defence and security. Within CEA, the Laboratory for Electronics & Information Technology (CEA-Leti) works with companies in order to increase their competitiveness through technological innovation and transfers. CEA-Leti is focused on micro and nanotechnologies and their applications, from wireless devices and systems, to biology and healthcare or photonics. Nanoelectronics and microsystems (MEMS) are at the core of its activities. As a major player in MINATEC campus, CEA-Leti operates 8,000-m² state-of-the-art clean rooms, on 24/7 mode, on 200mm and 300mm wafer standards. With 1,400 employees, CEA-Leti trains more than 190 Ph.D. students and hosts 200 assignees from partner companies. Strongly committed to the creation of value for the industry, CEA-Leti puts a strong emphasis on intellectual property and owns more than 1,700 patent families. For more information, visit www.leti.fr.

Press Contacts:

CEA-Leti
Thierry Bosc
+33 4 38 78 31 95
thierry.bosc@cea.fr

Technical contact:

CEA-Leti
Patrick Boisseau, project coordinator
+33 4 38 78 38 54
patrick.boisseau@cea.fr

Agency

Amélie Ravier
+33 1 58 18 59 30
raviera@loomisgroup.com