MySpine: a virtual spine for a real problem

EU-funded project aims to improve treatment and prognosis of spinal diseases

Barcelona, 22 December 2010 – Lower back pain is not only miserable and debilitating for the 25% of the population who suffer from it at some point during their lives, but it also has a detrimental effect on society and the economy. The problem costs the EU €7000 per inhabitant per year, and is one of the major causes of long-term absences from work.

Despite being such a common problem, the decision-making process in the clinic regarding the treatment of lumbar or low back pain is poorly lacking. While surgery can help to alleviate the symptoms, it is only a short-term solution, as clinical prognosis is largely based on past experience or trial and error, and there tends to be progressive disc degeneration leading to reemergence of pain.

MySpine, or 'Functional prognosis simulation of patient-specific spinal treatment', is a major new research project funded by the EU which aims to address the current limitations in the treatment and prognosis of back problems such as degenerative disc disease. Coordinated by the Institute for Bioengineering of Catalonia (IBEC) in Barcelona, MySpine aims to develop a 'virtual spine' to guide clinicians in making the right decisions on how to treat various pathologies based on data specific to the patient.

"The system will take into account various factors, both from imaging data (MRI and CT scans) and from the activity levels of the individual," says coordinator Damien Lacroix, head of IBEC's Biomechanics and Mechanobiology group, who prepared the project together with Jérôme Noailly. "For example, spine geometries, tissue properties and loading histories – all of which vary wildly from person to person – will form the cornerstones of our predictive system, which will incorporate rational engineering approach."

MySpine's main objective will be the creation of a computing platform to be used in clinical settings. This interface, as well as the tailor-made 'database' of a patient's lumbar spine, will allow clinicians to look at short- or long-term effects on tissue to explore the possible outcomes of disc degeneration based on the specific patient.

"The results will allow the recommendation of either replacement of the disc, doing nothing, or another course of treatment based on safe assessment of the risks and benefits of each simulated solution to the problem," explains Damien, who earlier this year was elected President of the European Society of Biomechanics and received the European Society for Biomaterials' Jean Leray Award in September. "It brings new engineering rationale to the decision-making process in the clinic."

MySpine, which also involves groups from the Netherlands, Austria, France, Spain and Hungary, will start in March 2011 and is funded as a STREP (small or medium-scale focused research project) under FP7. ■

Contact: Vienna Leigh, IBEC, Baldiri Reixac 10-12, 08028 Barcelona. ✆ +34 934 034 744, ✉ vleigh@ibecbarcelona.eu

About IBEC: The Institute for Bioengineering of Catalonia is an interdisciplinary research centre focused on bioengineering and nanomedicine and based in Barcelona. Its mission is to conduct high quality research that, while creating knowledge, contributes to a better quality of life, improves health and creates wealth. IBEC establishes close links with international research centres, universities, hospitals and industry to exchange talent and develop and execute projects. The institute currently has 15 research groups and 200 researchers and staff from 18 different countries. IBEC's six research programmes are Cellular Biotechnology, Nanobiotechnology, Biomechanics and Cellular Biophysics, Biomaterials, Implants and Tissue Engineering, Medical Signals and Instrumentation, and Robotics and Biomedical Imaging. Its patrons and founders are the Generalitat de Catalunya, the University of Barcelona (UB) and the Universitat Politècnica de Catalunya (BarcelonaTech, UPC).

Contact: Vienna Leigh, IBEC, Baldiri Reixac 10-12, 08028 Barcelona. ✆ +34 934 034 744, ✉ vleigh@ibecbarcelona.eu