SpineFX
Initial Training Network

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Special points of interest:

Second training workshop held in Leeds

SpineFX's third training workshop took place at Devonshire Hall, University of Leeds from 12th to 15th July 2011. Entitled 'Research Management Skills for the Biomedical Engineer', the event was attended by 16 participants, six of whom were SpineFX fellows.

Participants travelled from around the UK and Europe to attend the week-long residential workshop. Delegates attended lectures on ethics and research integrity, intellectual property, statistics, project management, and effective posters and presentations.

Key speakers included:

- James Love, an Intellectual Property Lawyer;
- Dr. Monica Schofield, TuTech specialist on project management;
- Dr. Heather Sears, UNIVLEEDS, effective research communication;
- Dr. Bill Metcalf, Cambridge Strategic Management, PhD planning;

Networking time was facilitated by an ice-breaker session, quiz, and dinner.

SpineFX workshop delegates and trainers outside Devonshire Hall, University of Leeds.

The event was exceptionally well received with lectures obtaining a minimum satisfaction rate of over 80% in terms of relevance and quality of presentations.

One delegate commented: *"Learnt a ridiculous amount of useful things!"*

Another said:

"There was lots of interaction between teachers and the participants. Work on posters was useful."

In particular, the workshop was beneficial to many as an opportunity to network with their peers. Delegates were invited to join the SpineFX facebook* group that was set up after the previous year's workshop.

The workshop was held as part of SpineFX's remit to provide training and research in the area of spinal biomechanics and medical engineering associated with vertebral fracture. Over the four-year project a total of 9 workshops will be provided.

SpineFX acknowledges the generous contribution of European Union funding under the 7th Framework Programme, which has enabled this and other network workshops to take place.

* Search for 'SpineFX' under Facebook groups.

MARIE CURIE ACTIONS

Further Researchers Appointed to SpineFX

Two more researchers have been appointed to the SpineFX project.

Nicola Brandolini, from Faenza, Italy, began work on 16th September 2011 at the University of Leeds, UK as an **Early Stage Researcher**.

Nicola gained an MSc in Biomedical Engineering in 2010 from the University of Bologna where he specialised in biomechanics and artificial organs. His thesis focused on the structural characterization of the human lumbar vertebral body. Upon completion of his thesis, he joined the same laboratory as a research associate within the VPHOP project. During this period, he carried on the research activity he started during his thesis performing *in vitro* mechanical tests on human cadaveric spine specimens.

Bartosz Nowak, from Poland started work at industrial partner ulrich medical on 25th September 2011 as an **Experienced Researcher**.

Bartosz gained his PhD in mechanics from The Polish Academy of Science, Warsaw, Poland in 2009. After receiving his doctorate, Bartosz worked as an Assistant Professor at the Institute of Mechanics and Applied Computer Science, Casimir the Great University in Bydgoszcz, Poland.

He has published a number of papers in peer reviewed journals and is fluent in English, Polish and German. His current research activities concern developing and improving the interface of fixation devices e.g. between pedicle screw and vertebrae. Bartosz will work on WP9, supporting the work of Early Stage Researcher, Rebecca Kueny.

"Two more researchers appointed to the SpineFX project."

Nonfusion stabilization of degenerative lumbar spine

Degenerative disease of the lumbar spine affects many adults in middle and advanced age. Pain is the leading symptom. A nonfusion stabilisation with or without decompression might be indicated, if severe symptoms persist.

ulrich medical® has introduced the cosmicMIA, a nonfusion pedicle screw-based stabilisation system with a unique articulated screw. In this way load-shearing between the implant and spine is achieved, while simultaneously stabilising the instrumented segments against painful motion.

Furthermore, the load-shearing effect minimises the incidence of implant breakage and implant loosening, a well known complication especially in elderly people with reduced bone quality.

As no protecting fusion occurs, the threaded part of the screw is HA coated. This improves rapid bone ingrowth and long-term implant fixation. The latest clinical publications show the superiority of the dynamic cosmicMIA concept.

Stefan Breuer, ulrich medical

Paper of Interest: Kyphoplasty as Treatment for A3 Burst Fractures

F. Hartmann, E. Gercek, L. Leiner, P.M. Rommens. *Injury* (2010), doi:10.1016/j.injury.2010.03.025 (epub ahead of print)

The minimally invasive stabilisation of osteoporotic compression fractures by the percutaneous injection of a self-curing biomaterial (vertebroplasty / kyphoplasty) is a well-established method, albeit not without some controversy. The extension of this method to the fixation of traumatic burst fractures represents a challenging but attractive vision. In the present paper, the authors describe the treatment of type A3 burst fractures, in which some degree of disruption of the posterior wall of the vertebra is present, by balloon kyphoplasty. Initially favourable results are presented for the small cohort, with the caution that the type A3.3 fracture, generally considered a counter-indication for such a treatment, may require supplemental fixation by means of conventional implants. The paper is accompanied by an interesting editorial discussion of this very point. The longer term results are ambiguous. Nevertheless, the paper points towards a potential extension of minimally invasive treatment methods to more complicated fractures, an application that our research network is also actively and critically evaluating. For further reading, the earlier work of Maestretti et al. (European Spine Journal, 2007; 16(5): 601–610) is also recommended.

PD Dr. Stephen Ferguson

SpineFX is focused on providing training and research in the area of spinal biomechanics and medical engineering associated with vertebral fracture. The project is a Marie Curie Initial Training Network (ITN), Project Number 238690, and is funded by the European Commission. The network comprises four leading research universities and three companies with a track record in innovation.

The SpineFX ITN will deliver research in three domains: basic science, oriented research, and applied research whilst focusing on three underlining pathologies: osteoporosis, metastases, and trauma. Training is provided by 'experience through research', network-wide workshops, and local professional development provision.

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WE'RE ON THE WEB!

HTTP://WWW.SPINEFX.EU/

Focus on Early Stage Researcher: Ghislain Maquer

Ghislain Maquer is an Early Stage Researcher on the SpineFX Project working at the Univerity of Bern.

Ghislain, 25, was born in Lens in the north of France. Having successfully passed the national entrance examination, he continued his education at the *Ecole Nationale Supérieure de Physique de Strasbourg* (*ENSPS*), now known as Télécom Physique Strasbourg and in parallel followed an additional Master's course at Strasbourg Universty.

As his research interest is the modeling of living tissues in Finite Element, Ghislain completed his Master's thesis at Philips, in the Functional Development Department for Shaving in Drachten, the Netherlands. His topic (Hair manipulation: Skin model for shaver optimization) pertained to the development of a realistic FE model of the human skin with little computation time which was used to simulate extra elevation of the hair during manipulation of the skin. He graduated in Biomedical Engineering (Dipl. Ing.) and image processing, medical and surgical robotics (Msc) in 2009.

In 2008, Ghislain completed a successful internship at the Institute of Lightweight Design and Structural Biomechanics (ILSB) at *Vienna* University of Technology (TU WIEN, Austria), the institute where he would later start his doctoral studies in January 2010 and have the opportunity to become part of SpineFX as an Early Stage Researcher.

His research within the SpineFX project is focused on the role of intervertebral discs in the load transfer to the human vertebra. Thanks to this knowledge, a new diagnostic tool using CT-scan based FE models is being developed to improve the fracture prediction of any lumbar vertebrae. After almost two productive years at the ILSB, Ghislain decided to continue the project with his supervisor Prof. Philippe Zysset in Bern, Switzerland; therefore, he transferred to the Institute for Surgical Technology and Biomechanics (*ISTB*) at the University of Bern in October 2010.