

BASIC INFORMATION ON SUB-PROJECT

NAME OF PROGRAMME/FUND	Scholarship Fund - Sciex NMS ^{ch}
RESEARCH FIELD AND OTHER RESEARCH FIELDS INVOLVED (if applicable)	Engineering Sciences Medical Sciences
TITLE OF THE SUB-PROJECT	Modelling cartilage mechanics and mechanobiology (MCMM)
REGION OF THE CZECH REPUBLIC (according to the location of the home institution)	Prague
GRANT AMOUNT SPENT	61 166,25 CHF
INTERMEDIATE BODY	Swissuniversities
HOME INSTITUTION	Czech Technical University in Prague Department of Mechanics, Biomechanics and Mechatronics
HOST INSTITUTION	University of Zurich Center for Dental and Oral Medicine
NAME OF THE FELLOW	Michala Čadová

<p>ABSTRACT OF THE SUB-PROJECT</p>	<p>Since the mechanical stresses and strain fields within cartilage can hardly be estimated by experimental measurements, several mathematical models have been proposed. It has been shown that a complex behaviour of cartilage, that is a living system, cannot be described by simple analytical approaches that were used in early biomechanical studies. Instead these studies should be based on the structural and functional interactions within living systems.</p> <p>The goal of this project is hence to develop a mechanical model of cartilage for mechanobiological purpose. Anisotropic, viscoelastic and poroelastic behaviour of cartilage will be incorporated in the model. The model will be based on a combination of two methods used in biomechanics: discrete element analysis and finite element method. Mechanobiological model of cartilage together with the experimental measurements will help us to understand the mechanical pathways of osteoarthritis.</p> <p>Finally, the knowledge gained in the project may help significantly in designing and evaluating the next generation of cartilage tissue engineering implants.</p>
<p>DATE OF REALISATION OF THE FELLOWSHIP</p>	<p>1.10.2010 - 30.9.2011</p>
<p>MORE INFORMATION ON THE PROGRAMME</p>	<p>www.sciex.ch</p>