

BASIC INFORMATION ON SUB-PROJECT

NAME OF PROGRAMME/FUND	Scholarship Fund - Sciex NMS ^{ch}
RESEARCH FIELD AND OTHER RESEARCH FIELDS INVOLVED (if applicable)	Basic Biological Research, Basic Medical Sciences
TITLE OF THE SUB-PROJECT	Molecular clock measurement in humans
REGION OF THE CZECH REPUBLIC (according to the location of the home institution)	Prague
GRANT AMOUNT SPENT	30 811,14 CHF
INTERMEDIATE BODY	Swissuniversities
HOME INSTITUTION	Institute of Physiology ASCR, v.v.i., Neurohumoral regulations
HOST INSTITUTION	University of Zurich, Institute of Pharmacology and Toxicology
NAME OF THE FELLOW	Marta Nováková

ABSTRACT OF THE SUB-PROJECT

Human daily behavior is governed by a biological "circadian" clock located in the suprachiasmatic nuclei of the hypothalamus, but its molecular mechanism is duplicated in most cells throughout the body. In humans, overall clock properties (of period, phase, and amplitude) vary considerably among different individuals, and clock dysfunction has been tied to a variety of diseases, especially mood and affective disorders. The Brown laboratory has pioneered the use of primary fibroblast cultures taken directly from human subjects to study inter-individual variation in human clock function. In our proposal, this laboratory plans to host Marta Novakova (PhD student of PharmDr. Alena Sumova, Prague) in order to learn the techniques associated with such measurements. The Fellow will first apply them to a project analyzing the molecular signaling pathways involved in mediating the effects of light upon human circadian clocks, and then adapt them to look at inter-individual differences in the signal transduction pathways involved in the production of the hormone melatonin and the effects of light upon it. After the Sciex exchange, the Fellow will return to her home laboratory in Prague, where she will apply these technologies to the study of individuals suffering from bipolar disorder, as well as from age- and sex-matched controls. She shall return to Zurich to analyze her samples in the custom-built high-throughput bioluminescence facility available there, using the assays that she has developed. The project will foster a tight collaboration between host and home laboratories. It will provide a unique training opportunity to the Fellow, allowing her to gain experience using a model system not currently employed in her home laboratory. More importantly, the project will realize one of the first mechanistic analyses into the pathways by which light impacts the human circadian oscillator. In a subsequent step (for which Sciex funding is not sought), the Home laboratory, together with the Host, will use these assays to explore the ties between bipolar disorder and circadian dysfunction.

DATE OF REALISATION OF THE FELLOWSHIP

18.6.2012 - 17.12.2012

MORE INFORMATION ON THE
PROGRAMME

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