**Report on the ISB Travel Grant** **VITALY KOCHIN**

The ISB Graduate School co-funded my attendance of the MBL's advanced summer course "Physiology: Modern Cell Biology Using Microscopic, Biochemical and Computational Approaches", Woods Hole, MA, USA, June, 9 – July, 29, 2007. This course was very fruitful as it greatly advance my knowledge and practical skills in imaging techniques, biochemical assays, and computational methods used for biological data analysis and interpretation.
The beauty and high efficacy of this course is based on the way it is organized: real research on real projects is performed during the course. The course takes seven weeks along with lectures given by famous scientists. Also the course offered me invaluable opportunity to establish connections with leading scientists in cell biology and biophysics fields.

During the course I participated in three project: with Dr. Claire Waterman (NIH) we studied cell motility by measuring traction forces (computational methods) that adherent cells apply onto the ECM substrate upon treatment with drugs. We were measuring traction forces of control fish keratocytes and those treated with myosin II inhibitor – blebbistatin (biochemical methods). I became experienced with live cell imaging and computational techniques in order to visualize forces cell applies to move. These work is made as part of the projects performed in Waterman's lab in NIH. The data we obtained is another step further in the research field studying the motility of cells including metastasizing cancer cells.

In the project with Dr. Tim Mitchison (Harvard Medical School) we were testing different drugs – small molecule inhibitors of mitosis (including anticancer drug BI2536, which is in phase II clinical trials now) to characterize their effects on mitotic spindle formation. We observed several very interesting phenotypes of spindles produced upon drug treatments. This work requires longer than two weeks time frame, so it is planned to be continued in Mitchison's lab after the course.

During the project with Dr. Jennifer Lippinkott-Schwarts (NIH, Cell Biology and Metabolism Branch, Bethesda, MD) we were testing ability of primary macrophages from Alzheimer's disease (AD) patient and age matched control individual to phagocyte amyloid beta. It was shown before in the literature that AD macrophages are defective in phagocyting amyloid-beta as compared to control ones. We wanted to investigate reasons of this phenomenon in more details. During 10 days we did a lot of live and fixed cells confocal laser scanning microscopy: we checked and quantified the ability of AD and control macrophages to phagocye amyloid-beta, polysterene beads, fluorecscently-labelled dextran. We labelled and quantified amounts of lyzosomes and actin in cells, and made a stricking observation that AD macrophages almost completely lack podosomes (the primary sites of integrin stimulated actin polymerization) as compared to control cells. This results are submitted as a poster abstract for the ASCB 2007 Meeting.

I recommend this course to PhD-students and postdocs as a truly interdisciplinary approach in studying cell biology. This course has changed my life! Thank you ISB so much for the support!