BİLKENT UNIVERSITY

MOLECULAR BIOLOGY AND GENETICS

DEPARTMENTAL SEMINAR

" Proteomic Analysis of Cell Surface Changes During Cell Division"

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Cell division is a fundamental process by which all living things propagate. Throughout the cell division different cellular complexes undergo dramatic re-organization in a coordinated manner. Cell surface morphology also undergoes dramatic changes during mitotis. The main aim of my laboratory is to study molecular mechanisms of cell division especially the cell surface reorganization in transition from interphase to mitosis. To investigate the cell surface reorganization of mammalian cells during cell division we performed a large-scale proteomic analysis. By making extensive use of quantitative proteomics we identified cell surface proteins whose cell surface localization is regulated in a cell cycle dependent manner (Ozlu et al., EMBO J. 2015). In this study over 700 cell surface proteins were identified and their surface exposure was quantified at two cell cycle stages as a cell progresses into cell division. 37 proteins were significantly enriched at the cell surface in interphase and 27 proteins were significantly enriched at the cell surface in mitosis. By combining analysis of cell biology, microscopy, mutational analysis, proximity based protein interaction assay we further focused on the molecular mechanism and the function of mitosis selective cell surface protein identified in this proteomic screen. Our analysis provides basic information on cell cycle progression mechanisms as well as potential pharmacodynamic biomarkers for anti-mitotic cancer chemotherapy.

Date-Time : Wednesday, Feb 24th , 2016 – at 15:40
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