Dr Joshua Rappoport

School of Biosciences (/schools/biosciences/index.aspx)

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About

(/university/colleges/les/research-gallery/josh-rappoport.aspx) For over fifteen years Dr Rappoport's research has focused upon the mechanisms by which biologically relevant molecules traffic into and out of cells. In particular Dr Rappoport's lab develops and applies innovative microscopy techniques to visualise the internalisation into cells of cargo relevant to human health. Along with collaborators at The University of Birmingham and beyond, Dr Rappoport studies the cellular entry of activated growth factor receptors in the context of cancer metastasis, as well as manufactured nanomaterials relevant to cellular nano-toxicology, as well as medical diagnostic and therapeutic delivery.

Postgraduate supervision

For a list of possible PhD projects offered by Dr Rappoport:

www.findaphd.com/search/customlink.asp?inst=birm-Biol&supersurname=Rappoport (http://www.findaphd.com/search/customlink.asp?inst=birm-Biol&supersurname=Rappoport)

Research

Research Theme within School of Biosciences: **Molecular and Cell Biology (/research/activity/cellbiology/index.aspx)**

Lab website address: **www.rappoportlab.com (http://www.rappoportlab.com/)**

The role of vesicle trafficking during cell motility

Cell motility represents a polarized cellular phenotype relevant to numerous physiological processes. These include wound healing, development of tissues and organ systems, proper function of the immune system, and metastatic progression of cancer. Membrane trafficking processes contribute to the production and maintenance of the motile phenotype. This can occur through regulation of membrane tension and cell signalling, as well as modulation of the localization and function of cell adhesion molecules and the vesicular fusion machinery.

Epithelial wound healing is an inducible model of cell motility. Re-epithelialization is a physiologically and medically significant topic with direct relevance to the diabetic population. One of the main goals of my laboratory is to determine the roles of vesicle trafficking processes in epithelial cell motility. This work will examine the roles of vesicle trafficking processes in different stages of cell motility, and determine which specific pathways are required for the production of the motile phenotype and/or steady-state rate of migration. Ultimately, this will result in the identification of potential therapeutic strategies for increasing (e.g. during wound healing) or decreasing (e.g. during metastasis) the rates of cell motility.

Specific Aims: 1. Determination of specific vesicle trafficking processes required for production of a polarized motile phenotype and/or steady-state rate of motility.

2. Assessment of transcriptional regulation of members of the vesicle trafficking machinery during the different stages of cell motility through gene expression profiling.

3. Identification of individual members of the vesicle trafficking machinery required for the different stages of cell motility.

Other projects:

Imaging integrin recycling during cell motility

Development of new assay platforms for imaging cell motility

Publications

Fletcher SJ, Rappoport JZ. Moving forward: polarised trafficking in cell migration. Trends Cell Biol. 2010 Feb;20(2):71-8.

Rappoport JZ, Simon SM. Endocytic trafficking of activated EGFR is AP-2 dependent and occurs through preformed clathrin spots. J Cell Sci. 2009 May 1;122(Pt 9):1301-5.

Rappoport JZ, Simon SM. A functional GFP fusion for imaging clathrin-mediated endocytosis. Traffic. 2008 Aug;9(8):1250-5.

Rappoport JZ. Focusing on clathrin-mediated endocytosis. Biochem J. 2008 Jun 15;412(3):415-23.