Prof. Ronit Sagi-Eisenberg, Ph.D.

Department of Cell and Developmental Biology
Sackler Faculty of Medicine

TEL AVIV UNIVERSITY
אוניברסיטת תל-אביב

Email: histol3@post.tau.ac.il

Molecular Basis of Allergic Diseases: Genomic and Functional Analyses

Positions

Professor, Sackler Faculty of Medicine

Chair, Scholarship Committee, Graduate School of Medicine

Research

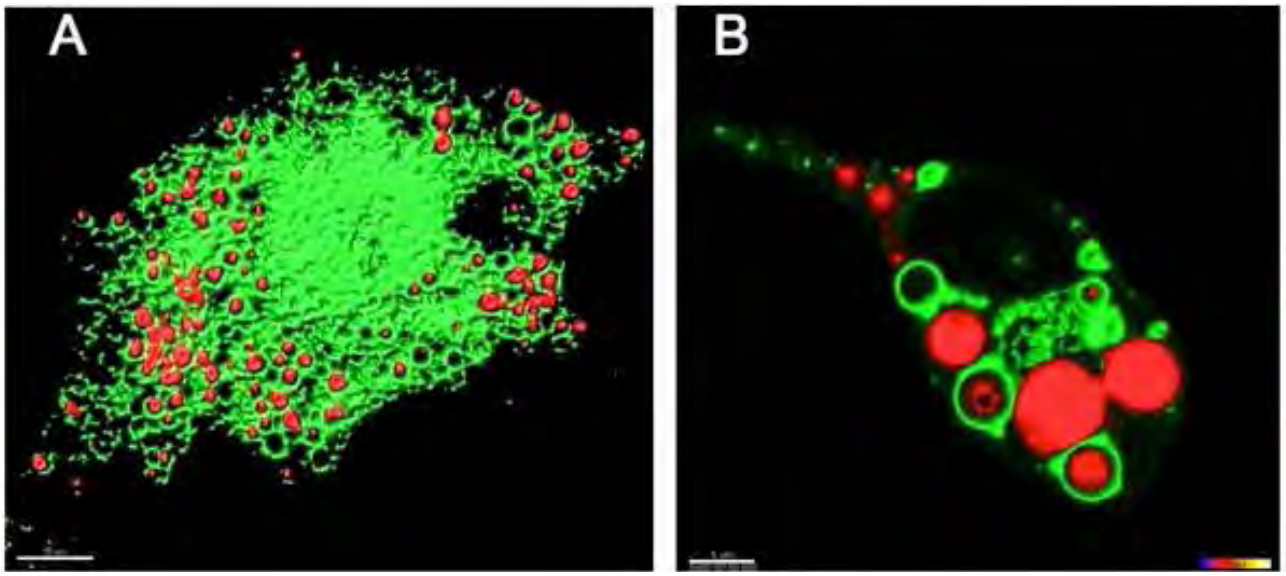
Our primary interest is the molecular basis of allergic and allergy related diseases, including skin allergy and asthma. Specifically, we explore the mechanisms underlying release of allergic (i.e. histamine) and inflammatory (i.e. cytokines) mediators from activated mast cells. Our research focuses on deciphering the signaling networks that link mast cell activation with mediator release and characterization of genes that could serve as cellular targets for the future development of anti allergic and asthma drugs. To this end, we combine functional genomics and phenotype driven screens of mast cells, activated by multiple stimuli, in order to recapitulate human pathophysiologic conditions. Research methods used include confocal microscopy in live and fixed cells; gene cloning; quantitative RT-PCR, pull down-assay; mass spectrometry, and bioinformatics.

Current projects in the lab include:

1. Exploring the genetic connections between the size of the mast cell secretory granules and mastocytosis.
2. Mast cells and cancer- the good, the bad and the ugly.
3. Decoding the Rab networks that control mast cell function.

Publications

Azouz, N.P., Zur, N., Efergan, Ohbayashi, N., Fukuda, M., Amihai, D., Hammel, I., Rothenberg· ME and **Sagi-Eisenberg, R.** Rab5 is a novel regulator of



Cell imaging of mast cells (RBL-2H3 mast cell line), which were co-transfected with NPY-mRFP (red), as reporter for the secretory granules, and GFP-tagged wild type (A) or active mutant (B) of the small GTPase Rab5A (green) reveals a dramatic effect of this Rab active mutant on the secretory granules size.

mast cell secretory granules: impact on size, cargo and exocytosis. *J Immunol*. 192:4043-53 (2014)

Bar-Gill-Benado, A., Efergan, A., Seger, R., Fukuda, M., and **Sagi-Eisenberg R.** The extra-cellular signal regulated kinases ERK1 and ERK2 segregate displaying distinct spatiotemporal characteristics in activated mast cells. *Biochim Biophys Acta*. 1833, 2070-2082, (2013).

Bernstein-Molho R., Kollender, Y., Issakov, J., Bickels, J., Dadia S., Flusser, G., Meller, I., **Sagi-Eisenberg. R**. and Merimsky O. Clinical activity of mTOR inhibition in combination with cyclophosphamide in the treatment of recurrent unresectable chondrosarcomas. *Cancer Chemother Pharmacol*. 70, 855-860, (2012).

Azouz NP, Matsui, T., Fukuda, M. and **Sagi-Eisenberg, R.** Decoding the regulation of mast cell exocytosis by networks of Rab GTPases. *J Immunol*. 189, 2169-2180. (2012).

Gorzalczany Y, Gilad Y, Amihai D, Hammel I, **Sagi-Eisenberg R**, and Merimsky O. Combining an EGFR directed tyrosine kinase inhibitor with autophagy-inducing drugs: a beneficial strategy to combat non-small cell lung cancer. *Cancer Lett*. 310:207-215. (2011).

Baram D, Dekel O, Mekori YA, and **Sagi-Eisenberg R**. Activation of mast cells by trimeric G protein Gi3; coupling to the A3 adenosine receptor directly and upon T cell contact. *J Immunol*. 184:3677-3688. (2010).

Review

Rudich N, Ravid K, and **Sagi-Eisenberg R**. Mast cell adenosine receptors function: a focus on the A3 adenosine receptor and inflammation. *Front Immunol*. 3:134. (2012).

Grants

2012-2015 The Israel Science Foundation**,** Dissecting the molecular mechanisms underlying mast cell exocytosis; new insights provided by the small GTPase Rab5