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Reproduction in Animal Models and in Humans

Positions

Professor, Sackler Faculty of Medicine

Gabriel Pinkas Chair for the Prevention and Diagnosis of Congenital Anomalies

Executive Committee, Open University, Member

Research

Our research focuses on Reproductive Physiology in animal models and in humans. The current research directions investigated in the laboratory are:

- The role of Fyn kinase, member of the Src family kinases, during meiosis and early events of oocyte activation, as well as in cancer cells (Figure-left panel).
- Fertility preservation - the signaling pathway leading to apoptosis in aging oocytes and in oocytes exposed to chemotherapeutic treatments and potential protectants (Figure -right panel).
- Regulation of angiogenesis in reproductive organs by Pigment epithelium derived factor (PEDF) and treatment of reproductive angiogenic-related pathologies.
- The role of Interleukin-1alpha in reproductive aging and in chemotherapy-induced exhaustion of ovarian follicular pool.

Various research methods are routinely used in the laboratory, ranging from *in vivo* animal studies and cells cultures to an array of protein methodologies such as western blotting, immunohistochemistry, molecular biology techniques as well as cellular and molecular imaging.

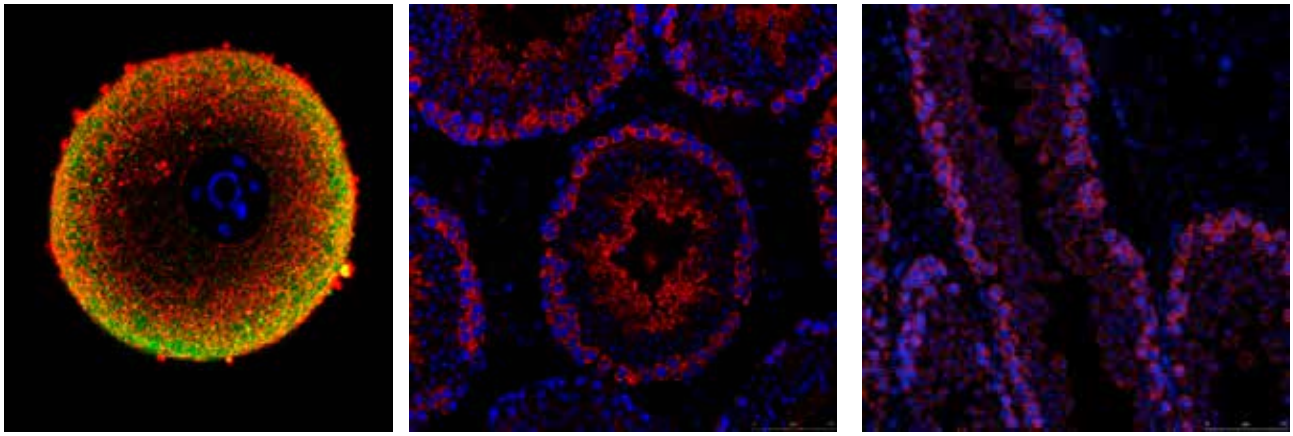
Publications

Levi M and **Shalgi R.** The role of fyn kinase in the release from metaphase in mammalian oocytes. *Mol Cell Endocr*. 314: 228-233, 2010.

Ben-Aharon, I., Bar-Joseph, H., Tzarfaty, G., Kuchinsky, L., Rizel, M., Stemmer, S.M. and **Shalgi, R.** Doxorubicin-induced ovarian toxicity. *Reprod Biol Endocr*. 8: 20-26. 2010.

Levi M, Maro B and **Shalgi R.** The involvement of Fyn kinase in resumption of the first meiotic division in mouse oocytes. *Cell Cycle*. 9: 1577-1589**,** 2010.

Bar-Joseph, H., Ben-Aharon, I., Rizel, S., Stemmer, S.M., Tzabari, M. and **Shalgi, R.** Doxorubicin-induced



Left panel- Human oocyte stained for DNA (blue); cytoskeleton (tubulin; red); protein (Fyn kinase; green). Arrow - Germinal vesicle (genetic material); C- Cytoplasm. Confocal microscopy. Right panels -Section of sperm producing tubules in mouse testis before (left) and after treatment with chemotherapy (right). The drug led to loss of sperm (S) production. DNA (blue); protein (DAZL; red). Immunofluorescent microscopy.

apoptosis in germinal vesicle (GV) oocytes. *Reprod Toxicol*. 30:566-72, 2010**.**

Levi, M., Maro, B. and **Shalgi R.** Fyn kinase is involved in cleavage furrow ingression during meiosis and mitosis. *Reproduction*. 140: 827-834, 2010.

*Recommended by Cell Cycle; 9:8, 1460-1461; April 15, 2010

Haberman, Y., Tsaadon, L., Eliyahu, E., and **Shalgi, R.** Receptor for activated C kinase (RACK) facilitates protein kinase C (PKC) mediated cortical granules exocytosis (CGE). *Theriogenology*, 75: 80-9, 2011.

Levi, M., Maro, B. and **Shalgi R.** The conformation and activation of Fyn kinase in the oocyte determine its localization to the spindle poles and cleavage furrow. *Reprod Fertil Dev*. 23: 846-857, 2011.

Bar-Joseph, H., Ben-Aharon, I., Stemmer, S.M., Tzabari, M. and **Shalgi, R.** Novel *in vivo* imaging of acute chemotherapy-induced vascular toxicity. *PLoS One*, 9: e23492, 2011.

Levi, M., Kraicer-Kaplan, R. and **Shalgi, R.** Regulation of division in mammalian oocytes: Implications for polar body formation. *Mol Hum Reprod*. 17:324-338, 2011.

Eliyahu, E., Shtraizent, N., **Shalgi, R**. and Schuchman, E. H. cation of cystatin SA as a novel inhibitor of acid ceramidase. *J Biol Chem*. 286:35624-33, 2011.

Eliyahu, E., Shtraizent, N., **Shalgi, R.** and Schuchman, E. H. Construction of conditional acid ceramidase knockout mice and in vivo effects on oocyte development and fertility. *Cell Physiol Biochem*. 30:735-748, 2012.

Chuderland, D., Dvashi, Z., Kaplan-Kraicer, R., Ben-Meir, D., **Shalgi, R.** and Lavi S. De novo synthesis of PPM1a is engaged in oocyte maturation. *Cell Mol Biol Lett*. 17:433-45. 2012.

Levi, M., Ninio-Mani, L. and **Shalgi R.** SRC protein kinases in mouse and rat oocytes and embryos. *Results Probl Cell Differ*. 55:93-106, 2012.

Chuderland*, D., Ben-Ami* I., Ronel, R., Kraicer-Kaplan, R., Grossman, H., Satchi- Fainaro, R., Eldar-Boock, A. and, **Shalgi, R**. Hormonal regulation of pigment epithelium derived factor (PEDF) in granulosa cells. *Mol Hum Reprod*. 19:72-81 2013

Chuderland*, D., Ben-Ami* R., Kraicer-Kaplan, R., Grossman, H., Ronel, R. and **Shalgi, R.** The role of pigment epithelium-derived factor in the pathophysiology and treatment of ovarian hyperstimulation syndrome in mice. *J Clin Endocr Metab*. 98:E258-66, 2013.

Chuderland, D.*, Hasky, N.*, Ben-Ami, I., Kaplan-Kraicer, R., Grossman, H. and **Shalgi R.** A physiological approach for treating endometriosis by recombinant pigment epithelial derived factor (PEDF). *Hum Reprod*. 28:1626-34, 2013.

Ninio-Many, L., Grossman, H., Chuderland D., Shomron, N. and **Shalgi, R.** microRNA-125a-3p reduces proliferation and migration of HEK 293T cells by targeting Fyn. *J Cell Sci*, 126:2867-2876, 2013.

Levi M, Ghetler Y, Shulman A and **Shalgi, R**. Morphologic and molecular markers indicate maturation-competence of human oocytes. *Hum Reprod*. 28:2482-9. 2013.

Ben Aharon, I., Bar Joseph, H., Tzabari, M., Shekman, B., Farzam, N., Levi, M., **Shalgi, R.,** Stemmer, SM. and Savion, N. Doxorubicin-induced vascular toxicity – Targeting potential pathways may reduce procoagulant activity. *PLoS One*, 8, e75157, 2013.

Chuderland D., Ben-Ami, I., Fridler, S., Hasky, N., Ninio-Many, L., Goldberg, K., Bar-Josef, H., Grossman, H., and **Shalgi, R.** Hormonal regulation of Pigment epithelium-derived factor (PEDF) expression in the endometrium. *Mol Cell Endocr*. 390, 85-92, 2014.

Ninio-Many, L., Grossman, H., Levi, M., Zilber, S., Tsarfaty, I., Shomron, N., Tuvar, A., Chuderland D., Stemmer, S.M., Ben-Aharon, I.* and **Shalgi R.*** MicroRNA miR-125a-3p modulates molecular pathway of motility and migration in prostate cancer cells. *Oncoscience*. 1, 250-261, 2014._

Bar-Joseph, H., Ido Ben-Ami, I., Ron-El, R., **Shalgi, R*.** and Chuderland, D*. Pigment epithelium-derived factor (PEDF) exerts anti oxidative effects in granulosa cells. *Feril Steril* 102:891-898.e3. 2014.

Uri-Belapolsky, S., Shaish, A., Eliyahu, E., Grossman, H., Levi, M., Chuderland, D., Ninio-Many, L., Hasky, N., Shashar, D., Almog, T., Kandel-Kfir, M., Harats, D., **Shalgi, R.*** and Kamari, Y*. Interleukin-1 deficiency prolongs ovarian lifespan in mice. *Proc Natl Acad Sci USA*. 111:12492-7. 2014.

*Highlighted by World of Reproductive Biology: Overcoming Age in the Ovary Biol Reprod biolreprod.114.124776; published ahead of print August 27, 2014,

*Recommended by F1000Prime Interleukin-1 deficiency prolongs ovarian lifespan in mice. Rep. 2014; 6. Published online Sep 10, 2014.

Yesilaltay, A., Dokshin, G., Busso, D., Galiani, D., Chavarria, T.E., Vasile, E., Quilaqueo, L., **Shalgi, R.,** Dekel, N., Albertini, D., Rigotti, A., Page, D.C., Krieger, D.C. Excess cholesterol induces mouse

oocyte activation and may cause infertility. *Proc Natl Acad Sci USA*. 111:E4972-80. 2014.

Reviews

Levi, M., Kraicer-Kaplan, R. and **Shalgi, R.** Regulation of division in mammalian oocytes: Implications for polar body formation. *Mol. Hum. Reprod*. 324-338, 2011.

Levi, M., Ninio-Mani, L. and **Shalgi R.** Src protein Kinases in oocytes and embryos. Chapter 4 submitted to the book: "Mouse Development: From Oocyte to Stem Cells", Results and Problems in Cell Differentiation (RPCD) Series, Springer Publishing. 55:93-106. 2012.

Ben-Aharon, I. and **Shalgi, R.** What lies beyond chemotherapy induced ovarian toxicity. *Reproduction*, 144:153-163, 2012.

Chuderland, D., Ben-Ami, I., Bar-Joseph, H. and **Shalgi, R**. Pigment epithelium-derived factor (PEDF) in the reproductive system. *Reproduction*. 148:R53-R61. 2014

Grants

2014-2018 Israel Science Foundation (ISF) - Post transcription regulation of Fyn kinase by miR-125a-3p in the ovary - potential relevance to ovarian function