



# Department of Clinical Microbiology and Immunology Newsletter

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## Our department members at the Caesarea Retreat 2017



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Dear All,

It is my great pleasure to share with you all the 5th departmental newsletter. It covers the events in our department for the entire year of 2017.

In it, you will find a brief report of each lab, including the personal announcements (New team members, new research grants, prizes, conferences attended) and academic achievements.

In 2017, we were very fortunate to recruit Dr. Natalia Freund to our Department. She is going ahead with full power to establish her lab on the 8<sup>th</sup> floor at the faculty and she is very active in conducting her research. Furthermore, we were able to recruit a second new faculty member to our Department, Prof. Elhanan Borestein, and he will effectively join our department in the summer of 2018. I am also very proud to mention that our department has been extremely productive scientifically, publishing 47 papers in excellent journals.

We had a great departmental retreat in Qesaria, which was also attended by many outgoing members of the department. As department head I wish you all a happy new 2018 and good luck in your academic work, and just to kind remind you that I am here to help and work with you and my success of serving the department and its mandate is based on teamwork with you.

Please send me by email any comments, suggestions and ideas for things that you want to initiate and I will help.

Yours

Fuad A. Iraqi

Head of Department



## Updates from Our Labs



At the department retreat in Caesarea



Dept Head Prof. Fuad Iraqi and Mrs. Esther Flescher at our departmental retreat awarding the Flescher Travel Awards to PhD students Efrat Cohen and Sefi Zargarian



Dr. Dor Salomon delivering lecture on type 6 bacterial secretion systems at our Departmental retreat in Caesarea.

### Motti Gerlic Lab

1. **Personal Announcements**-Noam Baram started her MSc

2. **Academic announcements**- new publications, grants etc 2017.

-The Lab of Dr. Motti Gerlic has published:

1: Sisquella X, Ofir-Birin Y, Pimentel MA, Cheng L, Abou Karam P, Sampaio NG, Penington JS, Connolly D, Giladi T, Scicluna BJ, Sharples RA, Waltmann A, Avni D, Schwartz E, Schofield L, Porat Z, Hansen DS, Papenfuss AT, Eriksson EM, **Gerlic M**, Hill AF, Bowie AG, Regev-Rudzki N. Malaria parasite DNA-harboring vesicles activate cytosolic immune sensors. *Nat Commun.* 2017 Dec 7;8(1):1985.

2: Ralph M, Bednarchik M, Tomer E, Rafael D, Zargarian S, **Gerlic M**, Kobiler O. Promoting Simultaneous Onset of Viral Gene Expression Among Cells Infected with Herpes Simplex Virus-1. *Front Microbiol.* 2017 Nov 1;8:2152

3: McArthur K, D'Cruz AA, Segal D, Lackovic K, Wilks AF, O'Donnell JA, Nowell CJ, **Gerlic M**, Huang DCS, Burns CJ, Croker BA. Defining a therapeutic window for kinase inhibitors in leukemia to avoid neutropenia. *Oncotarget.* 2017 Jul28;8(35):57948-57963.

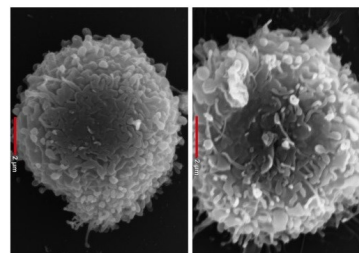
4: **Gerlic M**, Croker BA. Myelopoiesis embraces its inner weakness. *Nat Immunol.* 2017 Aug 22;18(9):953-954. Review

5: Zargarian S, Shlomovitz I, Erlich Z, Hourizadeh A, Ofir-Birin Y, Croker BA, Regev-Rudzki N, Edry-Botzer L, **Gerlic M**. Phosphatidylserine externalization, "necroptotic bodies" release, and phagocytosis during necroptosis. *PLoS Biol.* 2017 Jun 26;15(6):e2002711.

6: Shlomovitz I, Zargarian S, **Gerlic M**. Mechanisms of RIPK3-induced inflammation. *Immunol Cell Biol.* 2017 Feb;95(2):166-172. Review.

A5-Z-PI<sup>-</sup>

Live cells



### Gal Mor Lab

1. **Personal Announcements**- Gili Aviv has completed her Ph.D research and left the lab for post-doc training. Dr. Helit Cohen and Dr. Emiliano Cohen have joined the lab as research assistants.

2. **Academic announcements**-

The Gal-Mor Lab has published:1: Azriel S, Goren A, Shomer I, Aviv G, Rahav G, **Gal-Mor O**. The Typhi colonization factor (Tcf) is encoded by multiple non-typhoidal Salmonella serovars but exhibits a varying expression profile and interchanging contribution to intestinal colonization. *Virulence.* 2017 Nov 17;8(8):1791-1807.

2: Aviv G, Elpers L, Mikhlin S, Cohen H, Vitman Zilber S, Grassl GA, Rahav G, Hensel M, **Gal-Mor O**. The plasmid-encoded Ipf and Klf fimbriae display different expression and varying roles in the virulence of Salmonella enterica serovar Infantis in mouse vs. avian hosts. *PLoS Pathog.* 2017

### Ella Sklan Lab

**Academic announcements**- The Sklan Lab has published-

Nevo-Yassaf I, Lovelle M, Nahmias Y, Hirschberg K, **Sklan EH**. Live cell imaging and analysis of lipid droplets biogenesis in hepatitis C virus infected cells. *Methods.* 2017 Aug 15;127:30-36.



## Updates from our Labs

### Udi Qimron Lab.

#### 1. Personal Announcements-

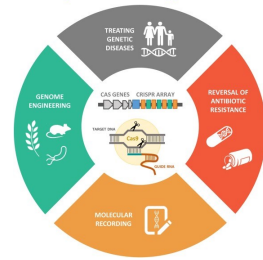
Dr. Moran Goren gave birth to her third child.

Dr. Miri Manor graduated her PhD studies.

**2. Academic announcements-** new publications, grants etc 2017. The Ministry of Science granted research funds for the lab. A new company, Trobix Bio, has been established, based on the lab technologies..

### CRISPR-Cas system

Key elements and applications



1: Globus R, **Qimron U**. Crystal-clear memories of a bacterium. *Science*. 2017 Sep15;357(6356):1096-1097. REVIEW

2: Manor M, **Qimron U**. Selection of Genetically Modified Bacteriophages Using the CRISPR-Cas System. *Bio Protoc*. 2017 Aug 5;7(15).

3: Globus R, **Qimron U**. A technological and regulatory outlook on CRISPR crop editing. *J Cell Biochem*. 2018 Feb;119(2):1291-1298. Review

4: Rozenberg P, Reichman H, Zab-Bar I, Itan M, Pasmanik-Chor M, Bouffi C, **Qimron U**, Bachelet I, Fulkerson PC, Rothenberg ME, Munitz A. CD300f:IL-5 cross-talk inhibits adipose tissue eosinophil homing and subsequent IL-4 production. *Sci Rep*. 2017 Jul 19;7(1):5922.

5: Yosef I, Goren MG, Globus R, Molshanski-Mor S, **Qimron U**. Extending the Host Range of Bacteriophage Particles for DNA Transduction. *Mol Cell*. 2017 Jun 1;66(5):721-728.e3.

6: Tabib-Salazar A, Liu B, Shadrin A, Burchell L, Wang Z, Wang Z, Goren MG, Yosef I, **Qimron U**, Severinov K, Matthews SJ, Wigneshweraraj S. Full shut-off of Escherichia coli RNA-polymerase by T7 phage requires a small phage-encoded DNA-binding protein. *Nucleic Acids Res*. 2017 Jul 27;45(13):7697-7707.

7: Goren M, Yosef I, **Qimron U**. Sensitizing pathogens to antibiotics using the CRISPR-Cas system. *Drug Resist Updat*. 2017 Jan;30:1-6. Review

### Fuad Iraqi Lab-

#### 1. Personal Announcements-

Ms. Luna Karkar has joined our lab for her MSc. Thesis

Ms. Yasmin Mansour has joined our lab for her MSc. Thesis

Publications 2017:

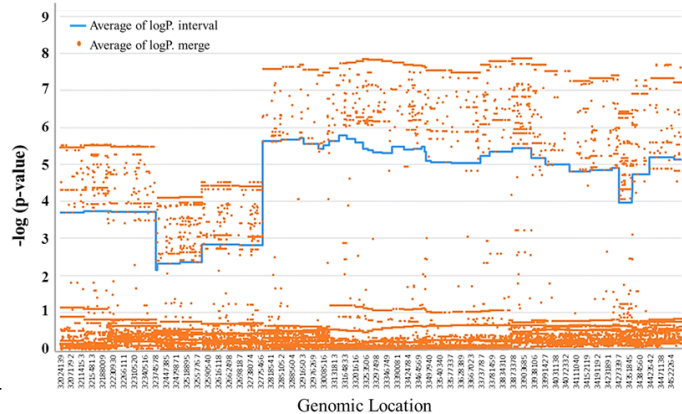
1: Nashef A, Qabaja R, Salaymeh Y, Botzman M, Munz M, Dommisch H, Krone B, Hoffmann P, Wellmann J, Laudes M, Berger K, Kocher T, Loos B, van der Velde N, Uitterlinden AG, de Groot LCPGM, Franke A, Offenbacher S, Lieb W, Divaris K, Mott R, Gat-Viks I, Wiess E, Schaefer A, **Iraqi FA**, Haddad YH. Integration of Murine and Human Studies for Mapping Periodontitis Susceptibility. *J Dent Res*. 2017 Dec 1:22034517744189.

2: Nashef A, Abu-Toamih Atamni HJ, Buchnik Y, Hasturk H, Kantarci A, Stephens D, Wiess EI, Hour-Haddad Y, **Iraqi FA**. Collaborative Cross Mouse Population for Studying Alveolar Bone Changes and Impaired Glucose Tolerance Comorbidity After High-Fat Diet Consumption. *J Periodontol*. 2017 Sep;88(9):e150-e158.

3: Shusterman A, Munz M, Richter G, Jepsen S, Lieb W, Krone B, Hoffman P, Laudes M, Wellmann J, Berger K, Kocher T, Offenbacher S, Divaris K, Franke A, Schreiber S, Dommisch H, Weiss E, Schaefer AS, Hour-Haddad Y, **Iraqi FA**. The PF4/PPBP/CXCL5 Gene Cluster Is Associated with Periodontitis. *J Dent Res*. 2017 Jul;96(8):945-952.

4: Nashef A, Agbaria M, Shusterman A, Lorè NI, Bragonzi A, Wiess E, Hour-Haddad Y, **Iraqi FA**. Dissection of Host Susceptibility to Bacterial Infections and ItsToxins. *Methods Mol Biol*. 2017;1488:551-578.

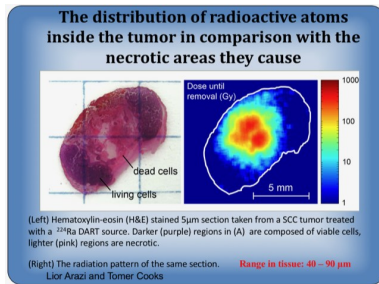
5: Abu-Toamih Atamni HJ, Ziner Y, Mott R, Wolf L, **Iraqi FA**. Glucose tolerance female-specific QTL mapped in collaborative cross mice. *Mamm Genome*. 2017 Feb;28(1-2):20-30.







## Yona Keisari Lab



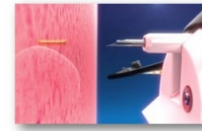
## Alpha DaRT Applicators



### Direct applicators

Alpha Tau Medical Applicator:

- Head & Neck
- Skin
- Prostate
- Breast



### Indirect applicators

Development collaborations with leading companies

- Pancreas
- Lung
- Liver

AlphaTAU

### Academic announcements- new publications.

-The Lab of Prof. Yona Keisari has published in 2017:

1: **Keisari Y.** Tumor abolition and antitumor immunostimulation by physico-chemical tumor ablation. *Front Biosci (Landmark Ed)*. 2017 Jan 1;22:310-347. Review.

2: Maman S, Sagi-Assif O, Yuan W, Ginat R, Meshel T, Zubrilov I, **Keisari Y**, Lu W, Lu W, Witz IP. The Beta Subunit of Hemoglobin (HBB2/HBB) Suppresses Neuroblastoma Growth and Metastasis. *Cancer Res*. 2017 Jan 1;77(1):14-26

## Rina Arbesfeld Lab

New publications in 2017.

1: Globus O, Evron T, Caspi M, Siman-Tov R, **Rosin-Arbesfeld R.** High-Temperature Requirement A1 (Htra1) - A Novel Regulator of Canonical Wnt Signaling. *Sci Rep*. 2017 Dec 21;7(1):17995.

2: Palevski D, Levin-Kotler LP, Kain D, Naftali-Shani N, Landa N, Ben-Mordechai T, Konfino T, Holbova R, Molotski N, **Rosin-Arbesfeld R**, Lang RA, Leor J. Loss of Macrophage Wnt Secretion Improves Remodeling and Function After Myocardial Infarction in Mice. *J Am Heart Assoc*. 2017 Jan 6;6(1). pii: e004387.

## Ariel Munitz Lab

### Personal announcements-Awards and Honors:

Recognition by the World Allergy Organization (WHO) as Center of Excellence (together with the Meir Hospital). **Dr. Michal Itan**- Faculty Prize for Excellence, **Perri Rozenberg**- Dan Moran Travel Fellowship **Hadar Reichman**- Best Abstract Award, International Eosinophil Society Meeting, Sweden

### Academic announcements- Awarded ICRF Project Grant 2017,

1: Rozenberg P, Reichman H, Moshkovits I, **Munitz A.** CD300 family receptors regulate eosinophil survival, chemotaxis, and effector functions. *J Leukoc Biol*. 2017 Dec 21.

2: Karo-Atar D, **Munitz A.** Is Asthma Paying the Toll? *Am J Respir Cell Mol Biol*. 2018 Jan;58(1):3-4. Review

3: Reichman H, Rozenberg P, **Munitz A.** Mouse Eosinophils: Identification, Isolation, and Functional Analysis. *Curr Protoc Immunol*. 2017 Nov 1;119:14.43.1-14.43.22.

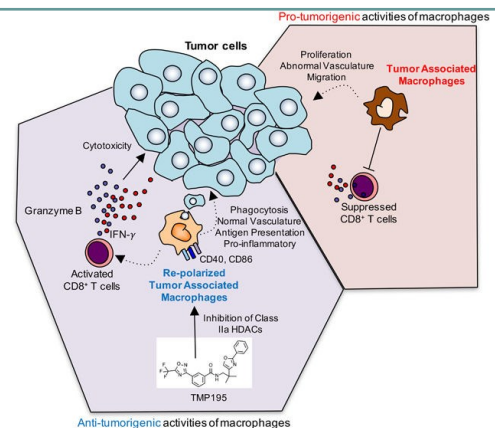
4: Salamon P, Shefler I, Moshkovits I, **Munitz A**, Horwitz Klotzman D, Mekori YA, Hershko AY. IL-33 and IgE stimulate mast cell production of IL-2 and regulatory T cell expansion in allergic dermatitis. *Clin Exp Allergy*. 2017 Nov;47(11):1409-1416

5: Reichman H, Karo-Atar D, **Munitz A.** Emerging Roles for Eosinophils in the Tumor Microenvironment. *Trends Cancer*. 2016 Nov;2(11):664-675. Review

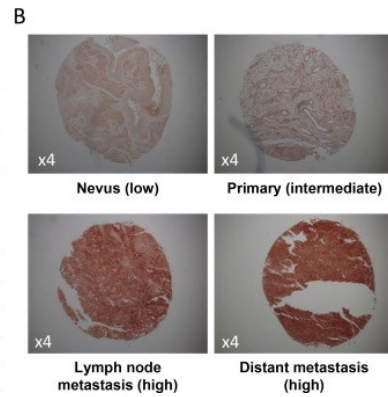
6: Rozenberg P, Reichman H, Zab-Bar I, Itan M, Pasmanik-Chor M, Bouffi C, Qimron U, Bachelet I, Fulkerson PC, Rothenberg ME, **Munitz A.** CD300f:IL-5 cross-talk inhibits adipose tissue eosinophil homing and subsequent IL-4 production. *Sci Rep*. 2017 Jul 19;7(1):5922.

7: Reichman H, **Munitz A.** Harnessing class II histone deacetylases in macrophages to combat breast cancer. *Cell Mol Immunol*. 2017 Jul;14(7):575-577. Review

8: Amit U, Kain D, Wagner A, Sahu A, Nevo-Caspi Y, Gonen N, Molotski N, Konfino T, Landa N, Naftali-Shani N, Blum G, Merquiol E, Karo-Atar D, Kanfi Y, Paret G, **Munitz A**, Cohen HY, Ruppin E, Hannehalli S, Leor J. New Role for Interleukin-13 Receptor  $\alpha 1$  in Myocardial Homeostasis and Heart Failure. *J Am Heart Assoc*. 2017 May 20;6(5). pii: e005108.



### Michal Besser Lab



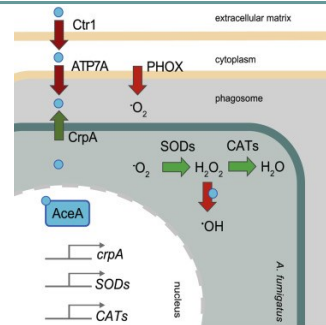
#### Academic announcements- new publications.

- 1: Galore-Haskel G, Baruch EN, Berg AL, Barshack I, Zilinsky I, Avivi C, **Besser MJ**, Schachter J, Markel G. Histopathological expression analysis of intercellular adhesion molecule 1 (ICAM-1) along development and progression of human melanoma. *Oncotarget*. 2017 Sep 14;8(59):99580-99586.
- 2: Seliktar-Ofir S, Merhavi-Shoham E, Itzhaki O, Yunger S, Markel G, Schachter J, **Besser MJ**. Selection of Shared and Neoantigen-Reactive T Cells for Adoptive Cell Therapy Based on CD137 Separation. *Front Immunol*. 2017 Oct 10;8:1211.
- 3: Baruch EN, Berg AL, **Besser MJ**, Schachter J, Markel G. Adoptive T cell therapy: An overview of obstacles and opportunities. *Cancer*. 2017 Jun 1;123(S11):2154-2162. Review
- 4: Merhavi-Shoham E, Itzhaki O, Markel G, Schachter J, **Besser MJ**. Adoptive Cell Therapy for Metastatic Melanoma. *Cancer J*. 2017 Jan/Feb;23(1):48-53.

### Nir Osherov Lab

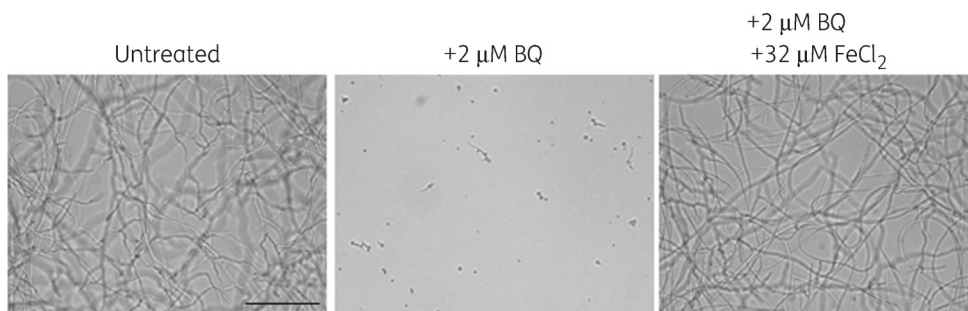
#### 1. Personal Announcements-

Tal Weingarten (MSc) has left the lab.  
Yachin Mandelblum (MSc) has joined our lab.



#### 2. Academic announcements- papers published in 2017

- 1: Shemesh E, Hanf B, Hagag S, Attias S, Shadkchan Y, Fichtman B, Harel A, Krüger T, Brakhage AA, Kniemeyer O, **Osherov N**. Phenotypic and Proteomic Analysis of the *Aspergillus fumigatus*  $\Delta$ PrT,  $\Delta$ XprG and  $\Delta$ XprG/ $\Delta$ PrT Protease-Deficient Mutants. *Front Microbiol*. 2017 Dec 12;8:2490.
- 2: Wiemann P, Perevitsky A, Lim FY, Shadkchan Y, Knox BP, Landero Figueora JA, Choera T, Niu M, Steinberger AJ, Wüthrich M, Idol RA, Klein BS, Dinauer MC, Huttenlocher A, **Osherov N\***, Keller NP\*. *Aspergillus fumigatus* Copper Export Machinery and Reactive Oxygen Intermediate Defense Counter Host Copper-Mediated Oxidative Antimicrobial Offense. *Cell Rep*. 2017 Jun 6;19(10):2174-2176. \* corresponding authors
- 3: Ben Yaakov D, Shadkchan Y, Albert N, Kontoyiannis DP, **Osherov N**. The quinoline bromoquinol exhibits broad-spectrum antifungal activity and induces oxidative stress and apoptosis in *Aspergillus fumigatus*. *J Antimicrob Chemother*. 2017 Aug 1;72(8):2263-2272.
- 4: **Osherov N**, Kontoyiannis DP. The anti-*Aspergillus* drug pipeline: Is the glass half full or empty? *Med Mycol*. 2017 Jan 1;55(1):118-124. Review



## Gal Markel Lab

### Academic announcements- new publications.

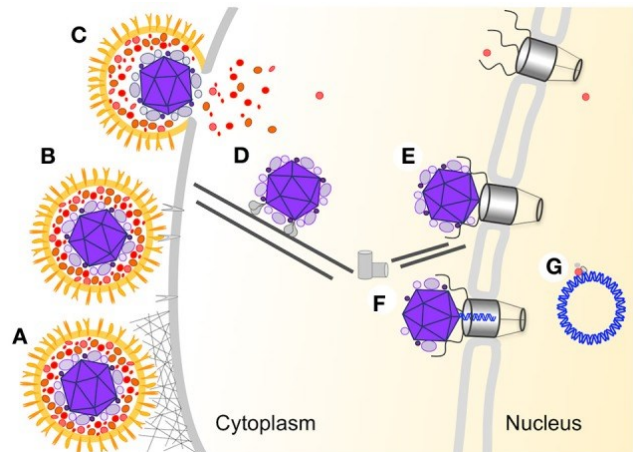
- 1: Lidar M, Giat E, Garelick D, Horowitz Y, Amital H, Steinberg-Silman Y, Schachter J, Shapira-Frommer R, **Markel G**. Rheumatic manifestations among cancer patients treated with immune checkpoint inhibitors. *Autoimmun Rev*. 2018 Mar;17(3):284-289.
- 2: Galore-Haskel G, Baruch EN, Berg AL, Barshack I, Zilinsky I, Avivi C, Besser MJ, Schachter J, **Markel G**. Histopathological expression analysis of intercellular adhesion molecule 1 (ICAM-1) along development and progression of human melanoma. *Oncotarget*. 2017 Sep 14;8(59):99580-99586.
- 3: Eisenberg V, Shamalov K, Meir S, Hoogi S, Sarkar R, Pinker S, **Markel G**, Porgador A, Cohen CJ. Targeting Multiple Tumors Using T-Cells Engineered to Express a Natural Cytotoxicity Receptor 2-Based Chimeric Receptor. *Front Immunol*. 2017 Sep 29;8:1212.
- 4: Seliktar-Ofir S, Merhavi-Shoham E, Itzhaki O, Yunger S, **Markel G**, Schachter J, Besser MJ. Selection of Shared and Neoantigen-Reactive T Cells for Adoptive Cell Therapy Based on CD137 Separation. *Front Immunol*. 2017 Oct 10;8:1211.
- 5: Zippel D, **Markel G**, Shapira-Frommer R, Ben-Betzalel G, Goitein D, Ben-Ami E, Nissan A, Schachter J, Schneebaum S. Perioperative BRAF inhibitors in locally advanced stage III melanoma. *J Surg Oncol*. 2017 Dec;116(7):856-861.
- 6: Baruch EN, Berg AL, Besser MJ, Schachter J, **Markel G**. Adoptive T cell therapy: An overview of obstacles and opportunities. *Cancer*. 2017 Jun 1;123(S11):2154-2162. doi: 10.1002/cncr.30491. Review. PubMed PMID: 28543698.
- 7: Merhavi-Shoham E, Itzhaki O, **Markel G**, Schachter J, Besser MJ. Adoptive Cell Therapy for Metastatic Melanoma. *Cancer J*. 2017 Jan/ Feb;23(1):48-53

## Oren Kobiler Lab

**Personal announcements-** Alina Sheetrit began her PhD, Dor Refael finished her MSc and started her PhD and Lev Shapira is writing up his PhD.

### Academic announcements- new publications.

- 1: Ralph M, Bednarchik M, Tomer E, Rafael D, Zargarian S, Gerlic M, K **Kobiler O**. Promoting Simultaneous Onset of Viral Gene Expression Among Cells Infected with Herpes Simplex Virus-1. *Front Microbiol*. 2017 Nov 1;8:2152.
- 2: Drayman N, Karin O, Mayo A, Danon T, Shapira L, Rafael D, Zimmer A, Bren A, **Kobiler O**, Alon U. Dynamic Proteomics of Herpes Simplex Virus Infection. *MBio*. 2017 Nov 7;8(6). pii: e01612-17.



## Dor Salomon Lab

### Personal Announcements:

Rotem Ben Yaakov joined the lab (M.Sc.) Muski Fridman joined the lab (M.Sc.)

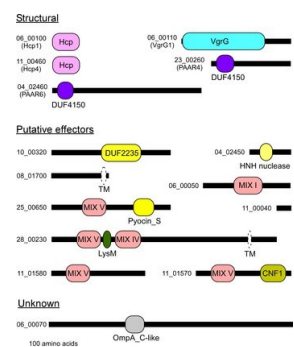
Kinga Kepel joined the lab (Admin)

Salomon lab in the news - <http://newmedia.calcalist.co.il/lv36/a029.html>

**Academic Announcements-Grants:** ISF - personal research grant, ISF - new lab equipment grant.

### New Publications-

- 1: Ray A, Schwartz N, de Souza Santos M, Zhang J, Orth K, **Salomon D**. Type VI secretion system MIX-effectors carry both antibacterial and anti-eukaryotic activities. *EMBO Rep*. 2017 Nov;18(11):1978-1990.
- 2: Li P, Kinch LN, Ray A, Dalia AB, Cong Q, Nunan LM, Camilli A, Grishin NV, **Salomon D**, Orth K. Acute Hepatopancreatic Necrosis Disease-Causing *Vibrio parahaemolyticus* Strains Maintain an Antibacterial Type VI Secretion System with Versatile Effector Repertoires. *Appl Environ Microbiol*. 2017 Jun 16;83(13).





## An interview with Dr. Natalia Freund, our new immunology group leader...



Natalia and family-husband On, Kids: Amalia (oldest), Adam (boy), Abigail (little one with pigtails).



Natalia and her new group (Ronen and Avia)

**Can you give us some personal details if possible- where do you live, your family, kids etc? what activities do you enjoy outside of work? Do you have hobbies?** My scientific career is really fulfilling and rewarding, but my biggest life achievement is my family. Maintaining a healthy work-life balance is no small feat, but my three children and my husband are what keeps me going and drives me forward, no matter how stressful and chaotic everything around me is. Other than work and family, which together take pretty much 99% of my time, I enjoy books, art, sports and travel.

**Tell us a bit about your academic journey- where did you study as an undergraduate, your Ph.D-with whom and on what? Your post doc with whom and on what? After your post-doc, where?** Academically, I grew up in Tel Aviv University. This is where I got my bachelor's degree, and I continued to complete my PhD at the Department of Cell Research and Immunology at the Life Science Faculty. During my doctoral studies, which I performed at the laboratory of Prof. Jonny Gershoni, I focused on antibodies and their epitopes. We initially focused on molecular delineation of the epitope, using random phage-displayed libraries. We then reconstituted the epitope as an isolated subunit, with the aim of preparing an epitope-based immunogen. It is during this inspiring period that I became truly passionate about science, and realized that being a scientist is the best job in the world. Upon graduation, I was offered a postdoc position at the laboratory of Dr. Michel Nussenzweig, a leading scientist at the field of HIV and human antibodies at The Rockefeller University in New York. Together with my husband, On, we decided to take this amazing opportunity and adventure, while moving with our newborn children across the globe. During my postdoc, I studied antibody responses in HIV-1-infected "elite controllers" - infected people who manage to maintain low viral loads in their blood without any cocktail treatment. I isolated several natural antibodies while focusing on antibody affinity maturation and development. During these five years I was thrilled to work alongside many brilliant people from all across the world, and these years were the most productive and stimulating I ever experienced. Seeing my family maturing and flourishing in New York City posed many dilemmas regarding our future. However, our Zionism and homesickness took over and brought us back to Israel. I always loved the TAU campus, its excellence and unique atmosphere and the fact that it brings together so many diverse subjects and disciplines. I feel very lucky to be part of it now, doing what I love most: science.

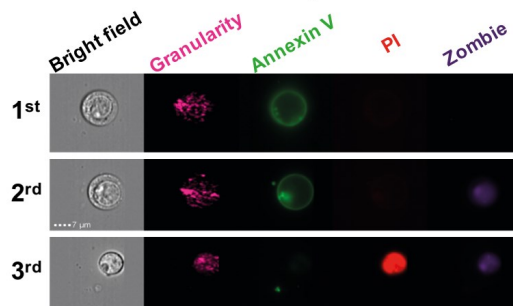
**What is the focus of your research in your lab at Sackler?** Here at my lab we continue to investigate how human antibodies mature and develop in response to various diseases. During my PhD I focused on the antibody response to SARS Co-V and during my postdoc on HIV-1. I was also exposed to projects investigating antibodies against influenza, HCV and Zika. However, while our understanding of the anti-viral antibody response has grown significantly over the last years, our comprehension of the anti-bacterial antibody response is still lagging. At the same time, bacterial infections are a growing public concern as the global rates of antibiotic-resistant strains increase. A case in point is the antibiotic-resistant *Mycobacterium Tuberculosis*, which grows more and more prevalent in the developed world, after years of sole reliance on antibiotic treatment. In light of this growing need to provide antibiotic-free solutions to combat bacteria, we are currently looking into anti-Tuberculosis antibodies naturally developed in patients. This is fascinating and new and I can't wait to see what we find.

**What do you find most interesting in your field? In biology?**

I am interested in understanding how things work and what stimulates their action. I am excited by every work that deciphers a mechanism, a pathway, or a molecular cascade that reveals another little piece of our complex structure, or that of the world around us. Naturally, I am excited about the different aspects of bio-recognition. In immunology, it is demonstrated in the unique ability of our immune response to distinguish its allies from its enemies. It is fascinating that commensal bacteria are tolerated, while pathogenic bacteria are rejected. So is the coevolution, or arms race, of viruses and antibodies during infection. I think it is an exceptional time to be a scientist, because now we have the technological tools to answer questions that some of greatest scientists, like Pasteur, Hook, and von Behring, could barely dream of.



### The three Necroptotic waves



Co-authors Sefi and Inbar

## How my paper was born- an interview with Dr. Motti Gerlic about his recent paper on Necroptosis in PLoS Biology.

**How my paper was born-** an interview with Dr Motti Gerlic about his recent paper in *PLoS Biology*

**Title of paper-** "Phosphatidylserine externalization," necroptotic bodies" release, and phagocytosis during necroptosis"

**Principle investigator-** Motti Gerlic

**Lead authors-** Sefi Zargarian and Inbar Shlomovitz

**Published in-** *PLoS Biology*

**Question-** Tell us about the most important findings in your paper? What are the implications?

Our paper looks into the mechanisms of necroptosis. Necroptosis is a programmed form of necrosis, or inflammatory cell death. Conventionally, necrosis is associated with unprogrammed cell death resulting from cellular damage or infiltration by pathogens, in contrast to orderly, programmed cell death via apoptosis.

The most important finding in our paper is that necroptotic cells secrete vesicles containing PS, pMLKL (necroptosis executioner) and other proteins. The secretion starts from an early necroptotic stage, while the plasma membrane is still intact. This finding indicates an intentional programmed delivery of factors that might affect the surrounding cells.

Annexin-V detects externalization of phosphatidylserine (PS) to the outer plasma membrane and is commonly used to distinguish apoptosis from other necrotic, inflammatory, cell death pathways. In another important finding, we discovered that PS exposure is not unique to apoptosis and occurs also during necrotic cell death, necroptosis.

**Question-** How was the idea for this study born?

The idea for this study was born due to two important (independent) observations:

1. Our finding of pMLKL (necroptosis executioner) in the supernatant of necroptotic cells (at the time, it was believed that pMLKL was inseparable from the cell membrane during necroptosis).
2. Necroptotic cells externalized PS in the early stages of necroptotic cells. Later on, these two observations came together.

**Question-** What were the hardest part of the research itself?

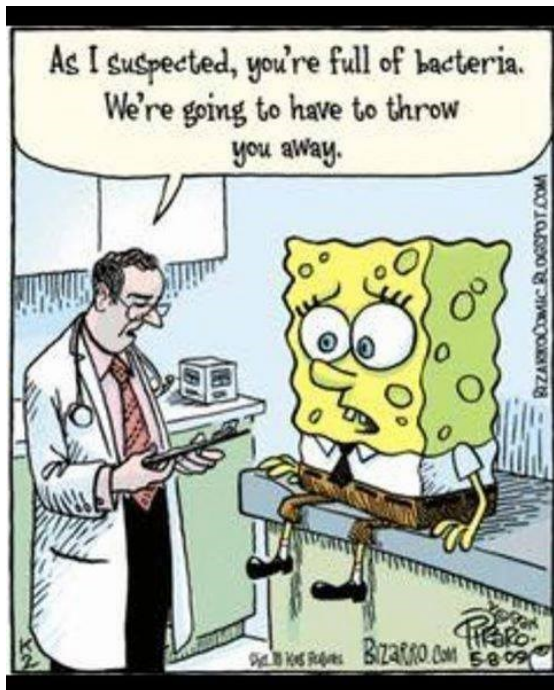
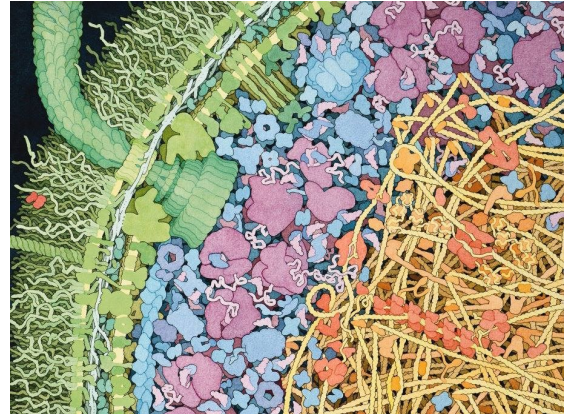
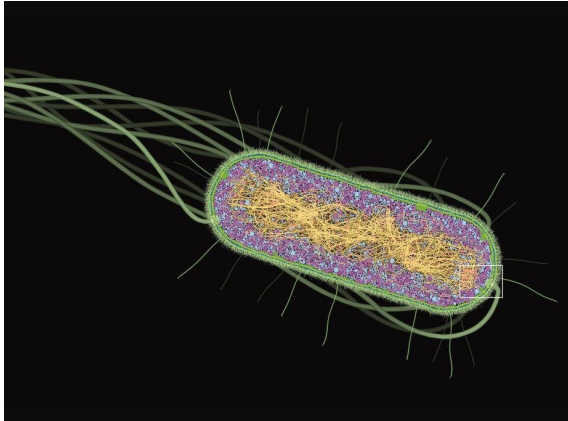
One of the hardest parts of the research was the phagocytosis assays. It was challenging to track the swallowed apoptotic and necroptotic cells in very short time points. But a team effort and the optimistic spirit of Motti (he is PI positive...) came through in the best way possible.

**Question-** What are you planning to do next in this exciting project?

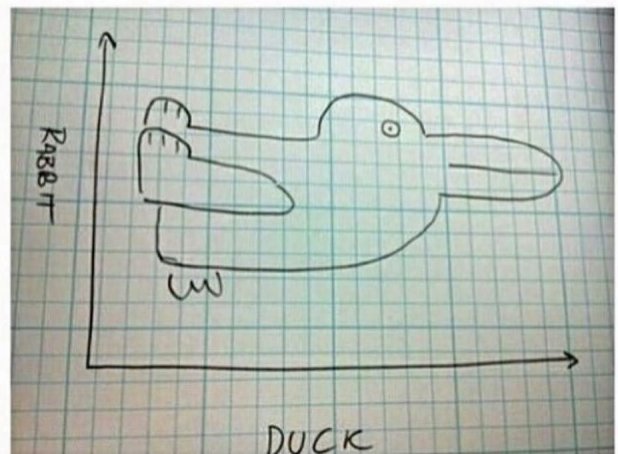
We're currently studying the content and effect of necroptotic vesicles in order to understand how necroptotic cells communicate with the surrounding cells.



# Interesting things from our departmental Facebook Page-

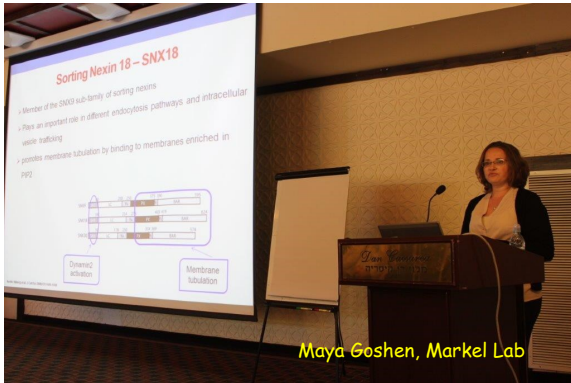


this is destroying my mind

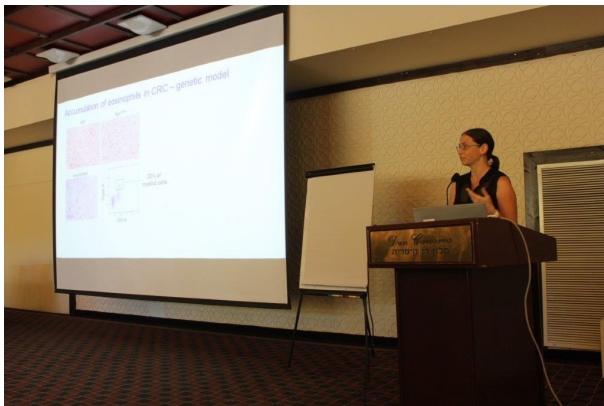




# Pics from our departmental retreat Caesarea 2017



Tsarfaty Group



Hadar Reichman, Munitz Lab



Sivan Ofir, Besser Lab



Fuad's Group



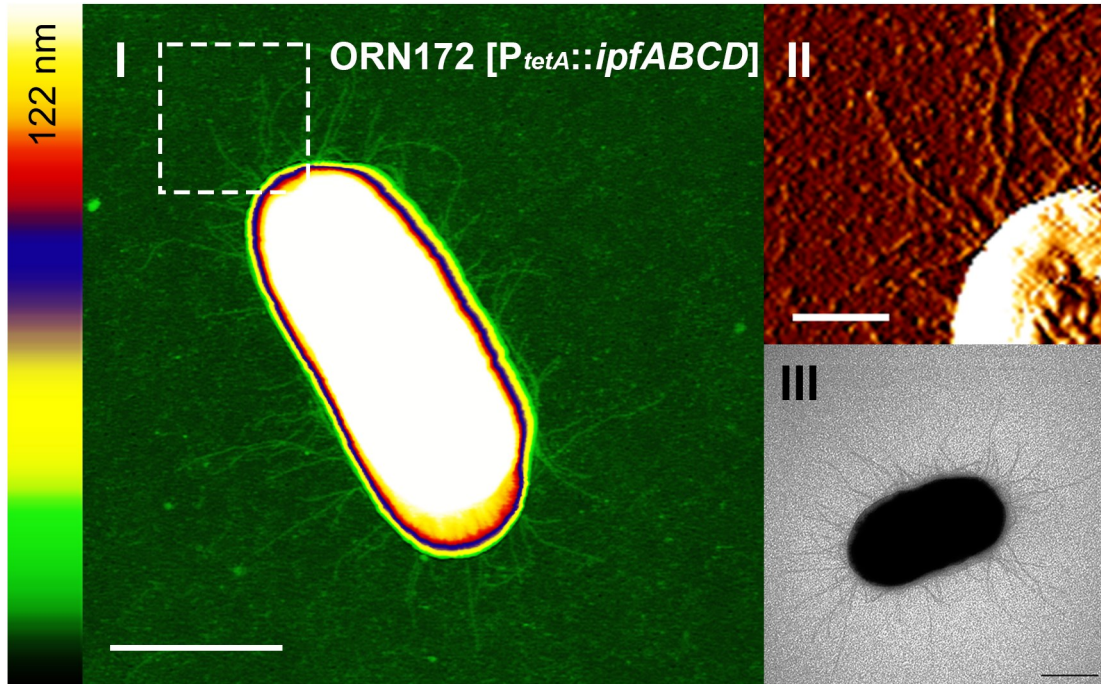
Osheroev Lab



Ruba Yehia, Iraqi Lab

## Lab Images of the Year

AFM (I and II) and TEM (III) images of the novel Ipf fimbriae identified by Ohad Gal Mors group



The novel antifungal Hemofungin localizes to the mitochondria of *Aspergillus fumigatus* (Osherov Group)

