



Department of Clinical Microbiology and Immunology Newsletter

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Issue 3
1.2.2016

Our department members at the Nazareth Retreat 2015



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Dear All,

It is my great pleasure to share with you all the 3rd departmental newsletter. It covers the events in our department for the entire year of 2015.

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.

Another new section features two interviews, one with myself, as new head of the department and the second with Dr. Ohad Gal-Mor about his recent paper in the Journal of Infectious Disease.

I am very proud to mention that our department has been extremely productive scientifically, publishing over 45 papers in excellent journals.

We had a great departmental retreat in Nazareth, which was also attended by many outgoing members of the department.

As department head I wish you all a happy new 2016 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



Incoming Dept Head Prof. Fuad Iraqi at our departmental retreat Nazareth 2015.



Ph.D student Yossi Levy (Tsarfaty Lab) giving his talk at our 2015 Nazareth retreat.

Motti Gerlic Lab

1. Personal Announcements-

New team members, prizes, conferences attended etc.

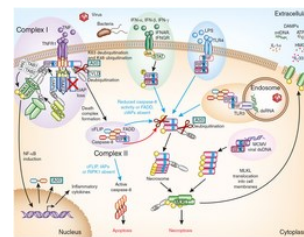
- Sefi Zargarian has joined our lab for his PhD. Thesis
- Inbar Shlomovitz has joined our lab for her PhD. Thesis

2. Academic announcements- new publications, grants etc.

-Dr. Motti Gerlic was awarded the **Israel Science Foundation grant** for 3 years.

-The Lab of Dr. Motti Gerlic has published:

1. Silke J, Rickard JA, Gerlic M. The diverse role of RIP kinases in necroptosis and inflammation. *Nat Immunol.* 2015 16:689-97. Review.
2. Croker BA, Silke J, Gerlic M. Fight or flight: regulation of emergency hematopoiesis by pyroptosis and necroptosis. *Curr Opin Hematol.* 2015 22:293-301. Review.



Gal Mor Lab

1. Personal Announcements-

-Dana Elhadad has left our lab and is writing up her PhD. Thesis. Dana attended the Annual 2015 ISM Conference in Bar-Ilan University and the World Congress and Expo on Applied Microbiology in Frankfurt Germany and presented short talks.

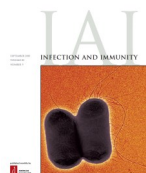
- Shalhevet Azriel and Gili Aviv attended the Annual 2015 ISM Conference in Bar-Ilan University and the Fall ISM workshop in Kefar Giladi and presented posters.

2. Academic announcements- new publications, grants etc.

-The Lab of Ohad Gal-Mor was awarded the prestigious **European Infect-ERA grant** for three years.

-The Lab of Ohad Gal-Mor was awarded the **Ministry of Agriculture & Rural Development Chief Scientist Grant** for three years. The Gal-Mor Lab has published:

1. Azriel S, Goren A, Rahav G, Gal-Mor O. The Stringent Response Regulator DksA Is Required for Salmonella enterica Serovar Typhimurium Growth in Minimal Medium, Motility, Biofilm Formation, and Intestinal Colonization. *Infect Immun.* 2015 84:375-84. (Featured on Cover)
2. Elhadad D, Desai P, Rahav G, McClelland M, Gal-Mor O. Flagellin Is Required for Host Cell Invasion and Normal Salmonella Pathogenicity Island 1 Expression by Salmonella enterica Serovar Paratyphi A. *Infect Immun.* 2015 83 (9):3355-68. (Featured on Cover)
3. Elhadad D, McClelland M, Rahav G, Gal-Mor O. Feverlike Temperature is a Virulence Regulatory Cue Controlling the Motility and Host Cell Entry of Typhoidal Salmonella. *J Infect Dis.* 2015 212:147-56.



Oshero Lab

1. Personal Announcements-

-Yakir Vaknin has left our lab and is writing up his PhD. Thesis.

- Einav Shemesh has left our lab and is writing up her M.Sc. Thesis.

- Dafna Ben Yaakov attended the 2015 TIMM (Trends in Medical Mycology) meeting in Lisbon Portugal and presented a poster.

- Dafna Ben Yaakov received the Gotwirt Scholarship.

2. Academic announcements- new publications.

1. Mircus G, Albert N, Ben-Yaakov D, Chikvashvili D, Shadkchan Y, Kontoyiannis DP, Oshero N. Identification and characterization of a novel family of selective antifungal compounds (CANBEFs) that interfere with fungal protein synthesis. *Antimicrob Agents Chemother.* 2015 59(9):5631-40.



New team members, prizes, conferences attended

Udi Qimron Lab.

1. Personal Announcements-

Oren Auster completed his M.Sc. studies. **Ruthie Kiro** completed her Ph.D. studies.

Omer Misgav and **Rea Globus** joined the lab as M.Sc. and Ph.D. students, respectively.

Dr. Tzvi Holtzman joined the lab for his Sabbatical.

2. Academic announcements- new publications, grants etc.

-Prof. Qimron was awarded the **Momentum grant** for 2 years (\$700,000) and the Sackler Research Fund for 1 year.

-The Lab of Prof. Qimron has published :

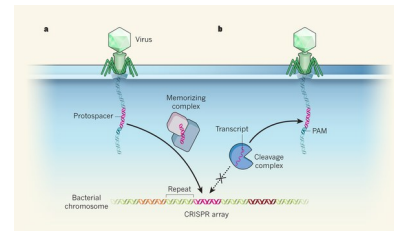
1: Goren MG, Yosef I, Qimron U. Programming Bacteriophages by Swapping Their Specificity Determinants. *Trends Microbiol.* 2015 23(12):744-6. Review.

2: Yosef I, Manor M, Kiro R, Qimron U. Temperate and lytic bacteriophages programmed to sensitize and kill antibiotic-resistant bacteria. *Proc Natl Acad Sci U S A.* 2015 112(23):7267-72.

3: Yosef I, Goren MG, Edgar R, Qimron U. Using the CRISPR-Cas System to Positively Select Mutants in Genes Essential for Its Function. *Methods Mol Biol.*

4: Levy A, Goren MG, Yosef I, Auster O, Manor M, Amitai G, Edgar R, Qimron U, Sorek R. CRISPR adaptation biases explain preference for acquisition of foreign DNA. *Nature.* 2015 23:520(7548):505-10.

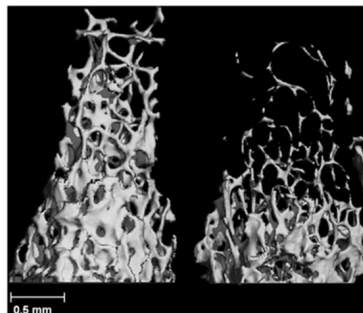
5: Yosef I, Qimron U. Microbiology: How bacteria get spacers from invaders. *Nature.* 2015 519(7542):166-7. News and Views.



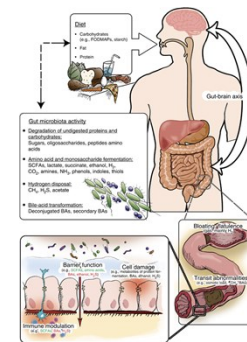
Fuad Iraqi Lab-

1. Personal Announcements-

Mrs. Ruba Yehia, **Ms. Rawan Qabaja** and **Mr. Hanna Saleem** have joined our lab for their MSc. thesis



Two representative μ CT images of the femoral trabecular compartment. Note the structural differences due solely to the genetic background



Intestinal Microbiota And Diet in IBS: Causes, Consequences, or Epiphenomena?

2. Academic announcements- new publications, grants etc.

Prof. Iraqi was awarded the following grants

Israel Cancer Research Foundation (ICRF), 1/09/2015-30/08/2016. APC gene in intestinal cancer development in Collaborative Cross mice.

Israeli Science Foundation (ISF), 1/10/2015-30/09/2018. Identification of modifiers for APC gene in intestinal cancer development in collaborative cross mice

1: Levy R, Mott RF, Iraqi FA, Gabet Y. Collaborative cross mice in a genetic association study reveal new candidate genes for bone microarchitecture. *BMC Genomics.* 2015 26:16(1):1013.

2: Lorè NI, Iraqi FA, Bragonzi A. Host genetic diversity influences the severity of *Pseudomonas aeruginosa* pneumonia in the Collaborative Cross mice. *BMC Genet.* 2015

3: Rajilić-Stojanović M, Jonkers DM, Salonen A, Hanevik K, Raes J, Jalanka J, de Vos WM, Manichanh C, Golic N, Enck P, Philippou E, Iraqi FA, Clarke G, Spiller RC, Penders J. Intestinal microbiota and diet in IBS: causes, consequences, or epiphenomena? *Am J Gastroenterol.* 2015 Feb;110(2):278-87. Review.

4: Aysar Nashef, Mahmoud Egbaria, Ariel Shusterman, Nicole Lore, Alessandra Bragonzi, Ervin Wiess, Yael Houry-Haddad and Fuad A. Iraqi (2015) Dissection of host susceptibility to Bacterial infections and its toxins. *System Genetics: Methods and Protocols.* Editors Kalus Schughart and Robert Williams. Springer Science + Business Media, LLC, New York. Book Chapter.

5: Muhamad Abu-Hussein, Nezar Watted, Mohammad Yehia, Peter Proff and Fuad A. Iraqi (2015) Clinical Genetic Basis of Tooth Agenesis. *Journal of Dental and Medical Sciences* 14(12): 1-10.



Yona Keisari Lab

1. Personal Announcements

Prof. Yona Keisari was appointed Treasurer of The International Cancer Microenvironment Society and as a Member of the editorial board of "Frontiers of Hematology Oncology"

Hila Confino and Ilan Hochman have received the academic posting of Ph.D.

Jenny Tikotsky has received the academic posting of M.Sc.

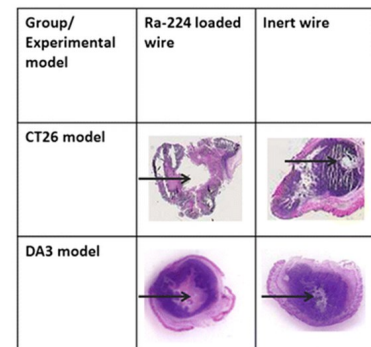
Jasmin Kayal has left our lab and is writing up her MSc. Thesis.

2. Academic announcements- new publications, grants etc.

-The Lab of Prof. Yona Keisari has published:

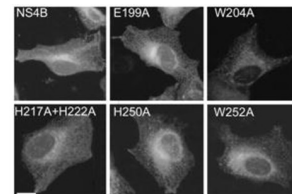
Confino H, Hochman I, Efrati M, Schmidt M, Umansky V, Kelson I, Keisari Y. Tumor ablation by intratumoral Ra-224-loaded wires induces anti-tumor immunity against experimental metastatic tumors. *Cancer Immunol Immunother.* 2015 64(2):191-9.

Reitkopf-Brodutch S, Confino H, Schmidt M, Cooks T, Efrati M, Arazi L, Rath-Wolfson L, Marshak G, Kelson I, Keisari Y. Ablation of experimental colon cancer by intratumoral 224Radium-loaded wires is mediated by alpha particles released from atoms which spread in the tumor and can be augmented by chemotherapy. *Int J Radiat Biol.* 2015 91(2):179-86.



Ella Sklan Lab

Academic announcements- new publications, grants etc.



Mutations in the C terminal domain of NS4B affect its interaction with NS5A

1: Levy G, Bomze D, Heinz S, Ramachandran SD, Noerenberg A, Cohen M, Shibolet O, Sklan E, Braspenning J, Nahmias Y. Long-term culture and expansion of primary human hepatocytes. *Nat Biotechnol.* 2015 33(12):1264-1271

2: Hung YF, Schwarten M, Hoffmann S, Willbold D, Sklan EH, Koenig B. Amino Terminal Region of Dengue Virus NS4A Cytosolic Domain Binds to Highly Curved Liposomes. *Viruses.* 2015 21:7(7):4119-30.

3: Yaffe Y, Hugger I, Yassaf IN, Shepshelovitch J, Sklan EH, Elkabetz Y, Yeheskel A, Pasmanik-Chor M, Benzing C, Macmillan A, Gaus K, Eshed-Eisenbach Y, Peles E, Hirschberg K. The myelin proteolipid plasmalogen forms oligomers and induces liquid-ordered membranes in the Golgi complex. *J Cell Sci.* 2015 1:128(13):2293-302.

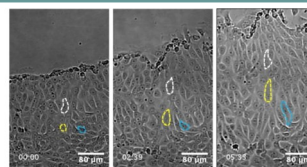
4: Hung YF, Schwarten M, Schünke S, Thiagarajan-Rosenkranz P, Hoffmann S, Sklan EH, Willbold D, Koenig BW. Dengue virus NS4A cytoplasmic domain binding to liposomes is sensitive to membrane curvature. *Biochim Biophys Acta.* 2015 1848(5):1119-26.

5: Cho NJ, Lee C, Pang PS, Pham EA, Fram B, Nguyen K, Xiong A, Sklan EH, Elazar M, Koytak ES, Kersten C, Kanazawa KK, Frank CW, Glenn JS. Phosphatidylinositol 4,5-bisphosphate is an HCV NS5A ligand and mediates replication of the viral genome. *Gastroenterology.* 2015 148(3):616-25.

6: David N, Yaffe Y, Hagoel L, Elazar M, Glenn JS, Hirschberg K, Sklan EH. The interaction between the hepatitis C proteins NS4B and NS5A is involved in viral replication. *Virology.* 2015 15:475:139-49.

Ilan Tsarfaty Lab

Academic announcements- new publications, grants etc.



Cells elongate to the direction of the wound edge followed by migration in a directional manner

1: Huang B, Jolly MK, Lu M, Tsarfaty I, Ben-Jacob E, Onuchic JN. Modeling the Transitions between Collective and Solitary Migration Phenotypes in Cancer Metastasis. *Sci Rep.* 2015 Dec 2;5:17379.

2: Hecht I, Natan S, Zaritsky A, Levine H, Tsarfaty I, Ben-Jacob E. The motility-proliferation-metabolism interplay during metastatic invasion. *Sci Rep.* 2015 4:5

3: Hecht I, Bar-El Y, Balmer F, Natan S, Tsarfaty I, Schweitzer F, Ben-Jacob E. Tumor invasion optimization by mesenchymal-amoeboid heterogeneity. *Sci Rep.* 2015 27:5:10622.

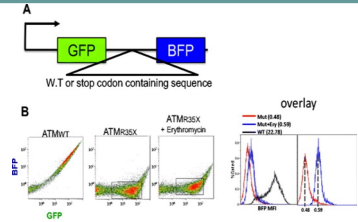
4: Zaritsky A, Natan S, Kaplan D, Ben-Jacob E, Tsarfaty I. Live time-lapse dataset of in vitro wound healing experiments. *Gigascience.* 2015 25:4:8.



Rina Arbesfeld Lab

New publications, grants etc.

1: Caspi M, Firsow A, Rajkumar R, Skalka N, Moshkovitz I, Munitz A, Pasmanik-Chor M, Greif H, Megido D, Kariv R, Rosenberg DW, Rosin-Arbesfeld R. A flow cytometry-based reporter assay identifies macrolide antibiotics as nonsense mutation read-through agents. *J Mol Med (Berl)*. 2015 Dec 1.



Ariel Munitz Lab

1. Personal Announcement

Ariel Munitz has received the Sackler Faculty of Medicine Research Excellence Award and the Eva & George Klein Award given by the Israel Science Foundation

Ariel Munitz has been selected to serve on the Editorial Board of *The American Journal of Respiratory Cell Molecular Biology* (official Journal of the American Thoracic Society).

Mor Kishon has joined our lab for her MSc. Thesis. **Yona Paranoushi** has joined our lab for her PhD. -

Itay Moshkovits has left our lab and has submitted his PhD. Thesis Itay was awarded the Sheba Medi-Center MD PhD Award. He also has attended the Bi-Annual International Eosinophil Symposium Conference in Chicago and presented a poster.

Hadar Reichman was awarded the Best Abstract Award in the 2015 Israel Cancer Research Symposium and the Best Abstract Award in 1st D'jerassi Student Symposium

Netali Morgenstern Ben Baruch attended the Israel Immunology Society Meeting Conference in the Weizmann Institute and presented a short talk.

- **Hadar Reichman** and **Netali Morgenstern Ben Baruch** have attended the Bi-Annual International Eosinophil Symposium Conference in Chicago and presented a short talk.

2. Academic announcements- new publications, grants etc.

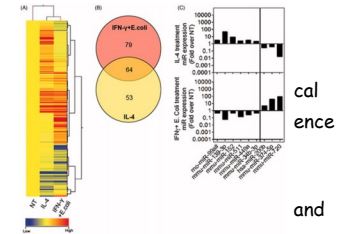
1: Caspi M, Firsow A, Rajkumar R, Skalka N, Moshkovitz I, Munitz A, Pasmanik-Chor M, Greif H, Megido D, Kariv R, Rosenberg DW, Rosin-Arbesfeld R. A flow cytometry-based reporter assay identifies macrolide antibiotics as nonsense mutation read-through agents. *J Mol Med (Berl)*. 2015 Dec 1.

2: Knipper JA, Willenborg S, Brinckmann J, Bloch W, Maaß T, Wagener R, Krieg T, Sutherland T, Munitz A, Rothenberg ME, Niehoff A, Richardson R, Hammerschmidt M, Allen JE, Eming SA. Interleukin-4 Receptor α Signaling in Myeloid Cells Controls Collagen Fibril Assembly in Skin Repair. *Immunity*. 2015 20:43(4):803-16.

3: Karo-Atar D, Bordowitz A, Wand O, Pasmanik-Chor M, Fernandez IE, Itan M, Frenkel R, Herbert DR, Finkelman FD, Eickelberg O, Munitz A. A protective role for IL-13 receptor $\alpha 1$ in bleomycin-induced pulmonary injury and repair. *Mucosal Immunol*. 2016 9(1):240-53.

4: Moshkovits I, Karo-Atar D, Itan M, Reichman H, Rozenberg P, Morgenstern-Ben-Baruch N, Shik D, Ejarque-Ortiz A, Hershko AY, Tian L, Coligan JE, Sayós J, Munitz A. CD300f associates with IL-4 receptor α and amplifies IL-4-induced immune cell responses. *Proc Natl Acad Sci U S A*. 2015 14:112(28):8708-13.

5: Karo-Atar D, Itan M, Pasmanik-Chor M, Munitz A. MicroRNA profiling reveals opposing expression patterns for miR-511 in alternatively and



Michal Besser Lab

Efrat Shoham has joined our lab as Postdoc. She gave an oral presentation at the Biennial CBRC Conference and was awarded for her "Outstanding Scientific Work".

Orit Itzhaki gave an oral presentation at the 7th International Conference of Tumor Microenvironment.

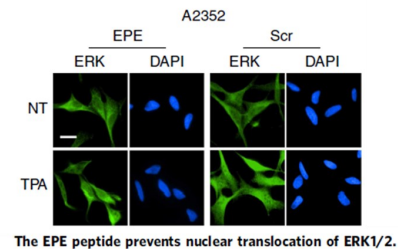
Academic announcements- new publications, grants etc.

1: Ortenberg R, Sapoznik S, Zippel D, Shapira-Frommer R, Itzhaki O, Kubi A, Zikich D, Besser MJ, Schachter J, Markel G. Serum CEACAM1 Elevation Correlates with Melanoma Progression and Failure to Respond to Adoptive Cell Transfer Immunotherapy. *J Immunol Res*. 2015;

2: Besser MJ, Shapira-Frommer R, Schachter J. Tumor-Infiltrating Lymphocytes: Clinical Experience. *Cancer J*. 2015 Nov-Dec;21(6):465-9.

3: Galore-Haskel G, Nemlich Y, Greenberg E, Ashkenazi S, Hakim M, Itzhaki O, Shoshani N, Shapira-Frommer R, Ben-Ami E, Ofek E, Anafi L, Besser MJ, Schachter J, Markel G. A novel immune resistance mechanism of melanoma cells controlled by the ADAR1 enzyme. *Oncotarget*. 2015 Oct 6;6(30):28999-9015.

4: Plotnikov A, Flores K, Maik-Rachline G, Zehorai E, Kapri-Pardes E, Berti DA, Hanoch T, Besser MJ, Seger R. The nuclear translocation of



The EPE peptide prevents nuclear translocation of ERK1/2.



Gal Markel Lab

1. Personal Announcements

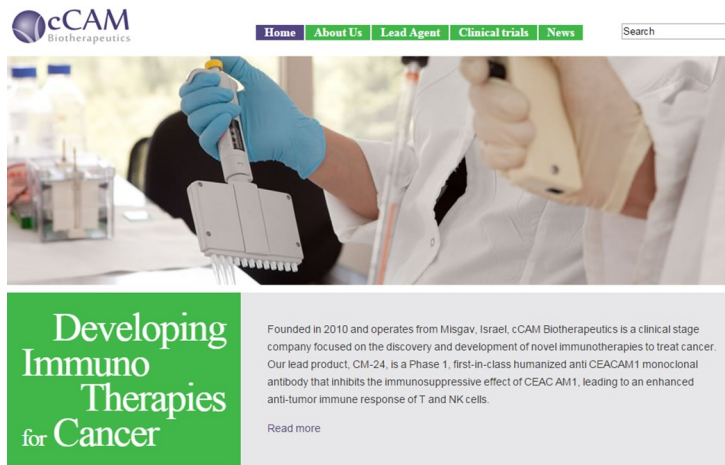
1. Personal Announcements-

A. PI awards, promotions, Academic postings etc

Gal Markel has received the academic posting of Associate Professor.

Prof Gal Markel was nominated as a member in the steering committee of the Israel Society of Cancer Research

cCAM Biotherapeutics, a company founded based on Gal Markel, Jacob Schachter and Rona Ortenberg's discoveries on the role of CEACAM1 as a new immune checkpoint and their anti-CEACAM1 mAb, initiated Phase I human trials at 02/2015 and was acquired by Merck & Co at 07/2015.



Ofek Dayan has joined our lab as an undergraduate student, **Jenny Milichenko** has joined our lab for her MSc. Thesis, **Rutie Polisar** has joined our lab for her PhD. Thesis, **Naama Margolis** joined our lab for her PhD. Thesis (MD PhD program). **Karin Kfir** received her MSc. Thesis and continues as a lab technician in our lab Karin presented a short talk at the Biennial CBRC meeting, Dead Sea. **Ella Bar-On** has joined our lab as a lab technician

Ronit Cohen left our lab and received her MSc. Degree. **Shira Ashkenazi** Left our lab and has submitted her PhD. Thesis. **Bella Zamlin-Visel** presented her work in an oral presentation in a student conference in Tel Aviv University. **Maya Goshen** gave a short talk at the Biennial CBRC meeting, Dead Sea, Israel. **Gilli Galore** received her PhD. Degree, gave an oral presentation at the International Cancer Microenvironment Symposium in Tel Aviv, Israel. **Dr Yael Nemlich** gave an oral presentation at the International Cancer Microenvironment Symposium in Tel Aviv, Israel. **Dr Sivan Danon** has left our lab.

2. Academic announcements- new publications, grants etc.

- 1: Haik J, Nardini G, Goldman N, Galore-Haskel G, Harats M, Zilinsky I, Weissman O, Schachter J, Winkler E, Markel G. Increased serum NKG2D-ligands and downregulation of NKG2D in peripheral blood NK cells of patients with major burns. *Oncotarget*. 2015 Dec 29.
- 2: Ortenberg R, Sapoznik S, Zippel D, Shapira-Frommer R, Itzhaki O, Kubi A, Zikich D, Besser MJ, Schachter J, Markel G. Serum CEACAM1 Elevation Correlates with Melanoma Progression and Failure to Respond to Adoptive Cell Transfer Immunotherapy. *J Immunol Res*. 2015;2015:902137.
- 3: Galore-Haskel G, Nemlich Y, Greenberg E, Ashkenazi S, Hakim M, Itzhaki O, Shoshani N, Shapira-Frommer R, Ben-Ami E, Ofek E, Anafi L, Besser MJ, Schachter J, Markel G. A novel immune resistance mechanism of melanoma cells controlled by the ADAR1 enzyme. *Oncotarget*. 2015 Oct 6;6(30):28999-9015.
- 4: Cohen R, Greenberg E, Nemlich Y, Schachter J, Markel G. miR-17 regulates melanoma cell motility by inhibiting the translation of ETV1. *Oncotarget*. 2015 Aug 7;6(22):19006-16.
- 5: Shoshan E, Mobley AK, Braeuer RR, Kamiya T, Huang L, Vasquez ME, Salameh A, Lee HJ, Kim SJ, Ivan C, Velazquez-Torres G, Nip KM, Zhu K, Brooks D, Jones SJ, Birol I, Mosqueda M, Wen YY, Eterovic AK, Sood AK, Hwu P, Gershenwald JE, Robertson AG, Calin GA, Markel G, Fidler IJ, Bar-Eli M. Reduced adenosine-to-inosine miR-455-5p editing promotes melanoma growth and metastasis. *Nat Cell Biol*. 2015 Mar;17(3):311-21.
- 6: Gur C, Ibrahim Y, Isaacson B, Yamin R, Abed J, Gamliel M, Enk J, Bar-On Y, Stanietsky-Kaynan N, Copenhagen-Glazer S, Shussman N, Al-mogy G, Cuapio A, Hofer E, Mevorach D, Tabib A, Ortenberg R, Markel G, Miklic K, Jonjic S, Brennan CA, Garrett WS, Bachrach G, Mandelboim O. Binding of the Fap2 protein of *Fusobacterium nucleatum* to human inhibitory receptor TIGIT protects tumors from immune cell attack. *Immunity*. 2015 Feb 17;42(2):344-55.
- 7: Zippel D, Barlev H, Ortenberg R, Barshack I, Schachter J, Markel G. A longitudinal study of CEACAM1 expression in melanoma disease progression. *Oncol Rep*. 2015 Mar;33(3):1314-8.



Fuad with his family



Fuad with lab members from left to right, Mahmoud Egbaria, Hanifa Abu Tohmih-Atamni, Roa'a Shekh Yousif and Fuad Iraqi at Nazareth Retreat 2015 Nazareth Retreat 2015

An interview with Prof. Fuad Iraqi, our new head of department...

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?

I live in Tira city with my wife, Fatin (MSc in teaching English as a second language), and three kids, Amjad (25 years old, MA in international Public policy and Director of Internal advocacy at Adallah for human rights), Yasmeeen (20 years old, 3rd year at TAU international) and Ayman (17 years old, senior year at the American International School). I love gardening and weekend is my gardening day. I love swimming, especially the very early morning sessions at the swimming pool at home. I do not have Facebook and I do not miss it. Working 24/7, and love international collaboration and diverse working environment.

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?

BSc in Biology, MSc in Biochemistry (supervisor Prof. Meir Rigbi), PhD in Genetics (Supervisors Prof. Moshe Soller and Jacque Beckmann), all conducted at the Hebrew University in Jerusalem. Following my PhD I took my first Postdoctoral position at the Hospital for Sick Children and University of Toronto, Toronto, Canada on developing transgenic fish. Second Postdoctoral position with USDA Institute at Michigan State University, East Lansing, USA on mapping genes underlying economical traits in chicken, and 3rd Postdoctoral at International Livestock Research Institute (ILRI), based in Nairobi Kenya working on mapping host genes underlying susceptibility to infectious diseases. Subsequently, I joined ILRI as Senior Researcher, where I worked for 13 years. Overall, I and my family lived about 20 years abroad, before joining TAU in 2006.

What is the focus of your research in your lab at Sackler? What do you find most interesting in your field? In biology?

My research is focused on understanding diseases etiology and host susceptibility to infection and chronic diseases and studying systems genetics for diseases, including *Klebsiella pneumoniae*, LPS and LTA stimulation, *Aspergillus fumigatus*, Periodontitis, development of type 2 diabetes (T2D) associated with high fat diet, mapping modifiers for colon cancer development by using the Collaborative Cross (CC) mouse population. This mouse population is under development in my laboratory since more than 12 years, ago. The project started at my previous post in Kenya, and then transfer to TAU in 2007. These projects are important for better understanding the host response/ability to different infection and chronic diseases, and will serve a step towards improving our knowledge of predictive genetics approaches for better disease prevention and control strategies.

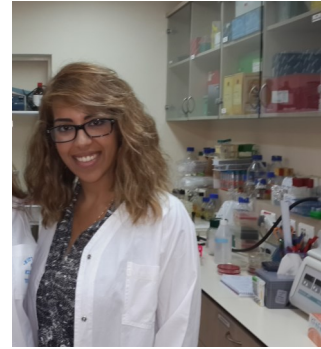
Using the CC mouse population, my team was the first to map host genes underlying infection diseases caused by opportunistic pathogens (*Klebsiella pneumoniae* and *Aspergillus fumigatus*), without immune compromising the host (normal immune system).



Ohads Group

From Left to right-

Gili Aviv, Shalhevet Azriel,
Ohad Gal-Mor, Galia Rahav,
Dana Elhadad, and Ari Robinson.



Dana Elhadad, first author

How my paper was born- an interview with Dr. Ohad Gal-Mor about his recent paper in the Journal of Infectious Disease.

How my paper was born- an interview with Dr. Ohad Gal-Mor about his recent paper in *Journal of Infectious Diseases* (<http://jid.oxfordjournals.org/content/early/2014/12/09/infdis.jiu663.abstract>)

Title of paper- "Feverlike Temperature is a Virulence Regulatory Cue Controlling the Motility and Host Cell Entry of Typhoidal Salmonella."

Principle investigator- Ohad Gal-Mor

Lead authors- Dana Elhadad

Published in- *Journal of Infectious Diseases*

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

While non-typhoidal serovars of the pathogen *Salmonella enterica* cause in humans a self-limiting gastroenteritis, other typhoidal pathogens of the same species lead to a life-threatening disease known as enteric (typhoid) fever. Mechanisms underlying these clinical differences are poorly understood. Our results showed that elevated physiological temperature is a novel cue controlling key virulence-associated phenotypes, including motility and host cell invasion in typhoidal serovars, but not in non-typhoidal serovars. These differences are likely to play a central role in the distinct clinical manifestations elicited by typhoidal vs. non-typhoidal *Salmonella*.

Question- How was the idea for this study born?

This is a good question as the initial findings were serendipity and discovered by chance. We routinely conduct in the lab, host-cell infection assays, in which the invasion of *Salmonella* strains into different host cells is examined. One day these experiments just stopped working and showed extremely low invasion efficiency of *S. Paratyphi A*. We re-did the experiment, but still couldn't reproduce the regular invasion capability of this pathogen into epithelial cells. When we checked what was changed in the protocol, we realized that the only difference was a different incubator that was used. When we measured the internal temperature of the incubator we found that it was 39°C instead of 37°C. When we lowered the temperature back to 37°C, *Salmonella Paratyphi A* became invasive again. That was the first time we made the connection between elevated temperature and *Salmonella* pathogenicity. At this point we realized that elevated physiological temperature, equivalent to fever is actually very important in regulating the invasion of typhoidal *Salmonella*, but does not affect the invasion of non-typhoidal serovars.

Question- Who was involved in doing all the hard research work?

The research was mainly done by Dana Elhadad - a talented and very dedicated Ph.D. student in my lab. Michael McClelland, our long-lasting collaborator from the University of California and Galia Rahav were also involved and provided strains and important clinical insights.

Question- What were the hardest and the happiest moments during the research itself?

The most exciting moment of the research (besides getting the acceptance letter from the JID editor) was after we had checked the actual temperature in the incubator and realized the potential of our accidental findings. Next, a lot of hard and tedious work came into play as we had to prove our hypothesis thoroughly, using different experimental approaches.

Question- Did everything go according to plan or were there unexpected results?

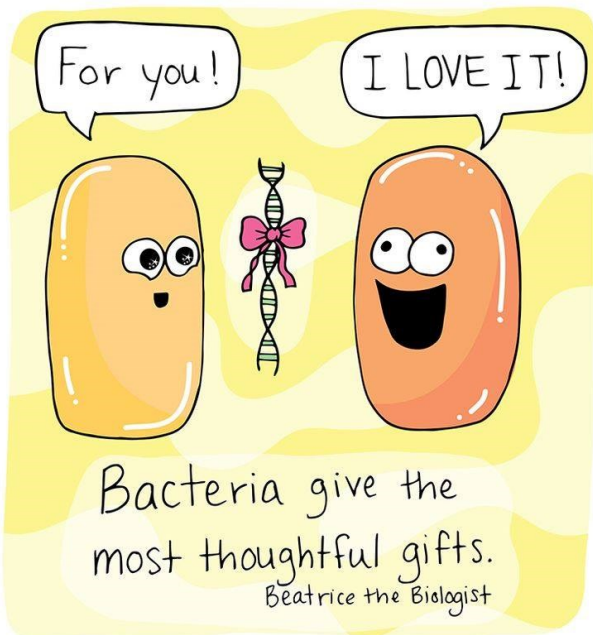
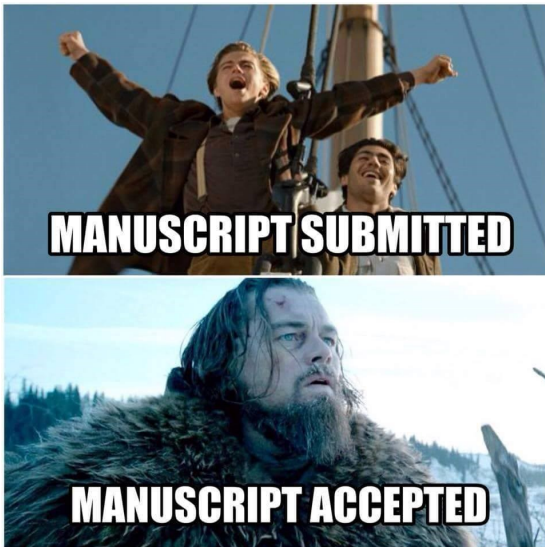
As mentioned above, the entire study was the result of an experiments that actually went wrong. It is really a lesson to learn, sometimes unexpected or unusual results are the most interesting ones and should not be disregarded.

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

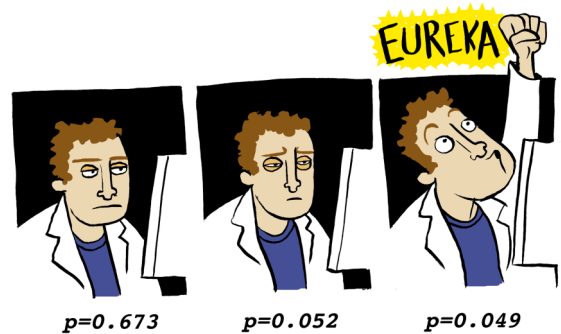
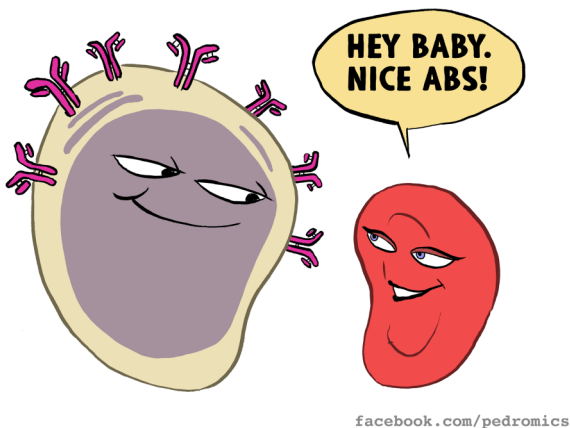
This study paved the way to two further papers and a new perspective about the different regulation of pathogenicity in *S. Paratyphi A* vs. non-typhoidal *Salmonella*. We now suggest that typhoidal *Salmonella* have evolved to respond to environmental cues including fever (high physiological temperature) and high oxygen concentration (aerobic environments) to reduce their invasion and Pathogen-associated molecular patterns (PAMPs) expression, which help them to evade the host immune response and gain access into deeper tissues during the infection.



Interesting things from our departmental Facebook Page-



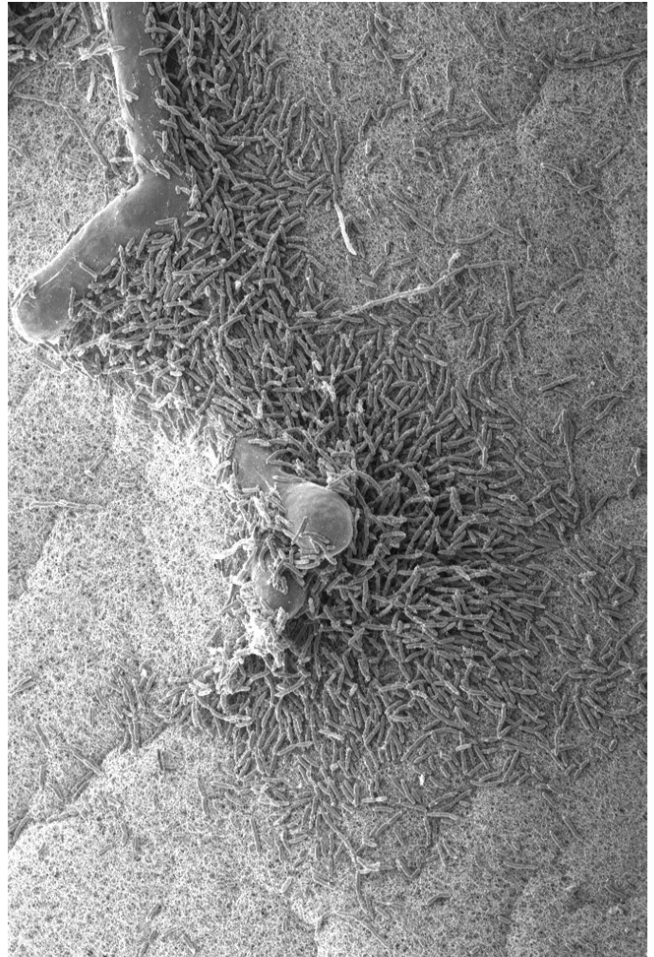
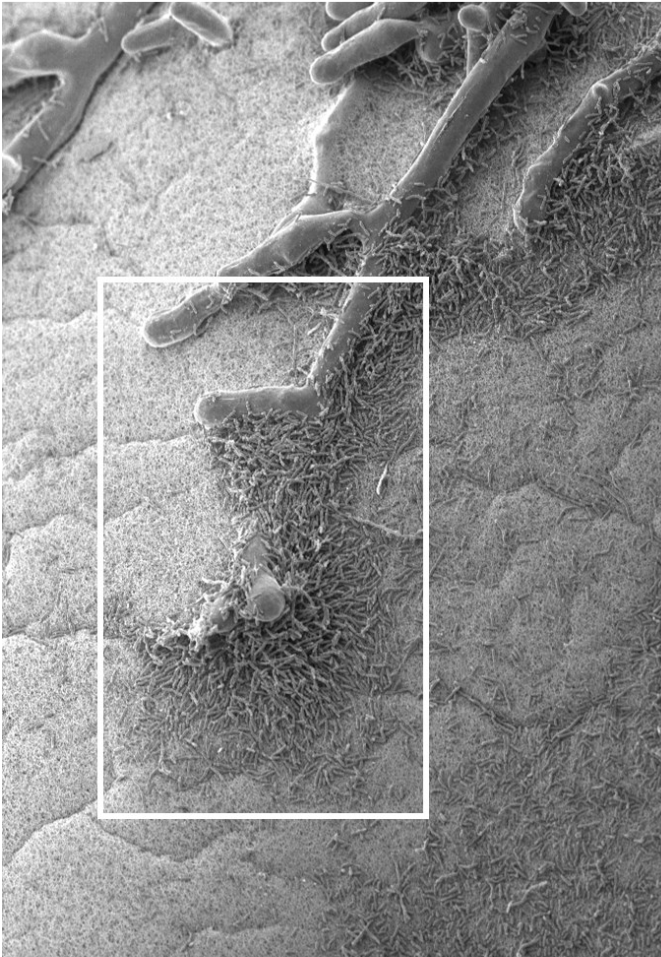
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Picture of the year- from the Osherov Lab...

Serratia marcescens bacteria swarming and killing fungal hyphae



With Boris Fichtman and Amnon Harel Bar-Ilan University