



STOCHASTICITY AND CONTROL OF IMMUNE REPERTOIRES

Jerusalem 18–23.6.2017

Program

Joint conference of the Israel Institute for
Advanced Studies and the Israel Science Foundation
Batsheva de Rothschild Seminar on

STOCHASTICITY AND CONTROL OF IMMUNE REPERTOIRES

Program



	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-9:30		Daniel Douek (NIH)	Yanay Ofran (BIU)	Martin Flajnik (U. of Maryland)	Johannes Textor (Radboud University)	Thomas Höfer (dkfz Heidelberg)
9:30-10:00		Felix Breden and Jamie Scott (Simon Fraser University, Canada)	Mikhail Shugay (Russian Academy of Sciences)	Sarah Cobey (University of Chicago)	Ronald B Gartenhaus (U. of Maryland)	Kim Jacobson (Monash University)
10:00-10:30			Becca Asquith (Imperial College)	Sol Efroni (BIU)	Shai Shen Orr (Technion)	Eilon Sherman (HUJI)
10:30-11:10		Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:10-11:40		Marie-Paule Lefranc (University of Montpellier)	Andrea Pagnani (Politecnico di Torino)	David Klatzmann (Pierre and Marie Curie)	Paul G. Thomas (St. Jude Children's Hospital)	Tomer Hertz (BGU)
11:40-12:10		Andrew Collins (New South Wales)	Thierry Mora (ENS)	Hedda Wardemann (dkfz Heidelberg)	Roi Gazit (BGU)	Ramit Mehr (BIU)
12:10-12:40	Registration + light lunch	Corey Watson (University of Louisville)	Tom Kepler (BU)	Rob de Boer (Utrecht)	Ken Buetow (Arizona State University)	Closing remarks: Uri Hershberg (Drexel)
12:40-13:30		Lunch	Lunch	Lunch	Lunch	
13:30-13:45						
13:45-14:00	Opening words: Gur Yaari (BIU)					
14:00-14:30	Mark Shlomchik (UPitt)					
14:30-15:00	Scott Boyd (Stanford)	Tutorial: Repertoire analysis (Jason Vanderheiden)	Tutorial: Mathematical models of the immune system (Rob de Boer)	Tour of the old city and via dolorosa	Tutorial: Mathematical models of the immune system (Haralampos Hatzikirou)	
15:00-15:30	Coffee break					
15:30-16:00	Steven Kleinstein (Yale)	Coffee break	Coffee break			Coffee break
16:00-16:30	Irun Cohen (Weizmann)	Victor Greiff (ETH)	Deborah Dunn Walters (U. of Surrey)			Yoram Louzoun (BIU)
16:30-17:00	Nir Friedman (Weizmann)	Martin Corcoran (Karolinska Institute)	Michal Or Guil (Humboldt)			Yifat Merbl (Weizmann)
17:00-17:30	Coffee break	Moriah Gidoni (BIU)	Chaim Schramm (NIH)			Wayne Marasco (Dana Farber)
17:30-18:00	Keynote speaker: Phil Hodgkin (Walter and Eliza Hall Institute of Medical Health)	Yuval Eshhar (Princeton)	Coffee break			Coffee break
18:00-18:30		Yariv Wine (TAU)	Uri Nevo (TAU)			
18:30-19:00	Social Dinner		Jean-Philippe Bürkert (Luxembourg)			
19:00-19:30			Franca Fraternali (King's College)			
19:30-20:00			Corbett Berry (Drexel University)			
20:00-23:59		Dinner on your own	Dinner on your own	Dinner at mishkanot sha'ananim		Social drinks

DAY 1: Sunday 18.6

12:10 – 13:30

Registration & light lunch

13:45 – 14:00

Opening words

Gur Yaari, Faculty of Engineering, Bar Ilan University

Session 1:

Chair: Steven Kleinstein

14:00 – 14:30

Signaling and Selection in the Germinal Center

Mark Shlomchik, University of Pittsburgh School of Medicine

14:30 – 15:00

B cell Repertoire Responses in Vaccination and Infection

Scott D Boyd, Stanford University

15:00 – 15:30

Coffee Break



SESSION 2:

Chair: Nir Friedman

15:30 – 16:00

Analysis of B Cell Antibody Reptories from Next-Generation Sequencing in Multiple Sclerosis Other Diseases

Steven H. Kleinstein, Yale School of Medicine

16:00 – 16:30

Updating Ideas About the Evolution of Life

Irun Cohen, Weizmann Institute of Science

16:30 – 17:00

T cells Go Public: The Organization of T Lymphocyte Repertoires in Health and Disease

Nir Friedman, Weizmann Institute of Science



17:00 – 17:30

Coffee Break



17:30 – 18:30

Keynote Speaker:

A Stochastic Caclus for T and B Lymphocyte Regulation and Control

Phil Hodgkin, Walter and Eliza Hall Institute of Medical Health

18:30 – 21:00

Social Dinner

DAY 2: Monday 19.6

Session 3: Chair: Sol Efroni

9:00 – 9:30

Predicting Who Does and Who Does Not Become Infected with HIV

Daniel Douek, National Institutes of Health

9:30 – 10:30

Creating Value from Antibody/B-cell and T-cell Repertoire Data: the AIRR Community Initiative

Felix Breden and Jamie Scott, Simon Fraser University

10:30 – 11:10

Coffee Break



Session 4:

Chair: Gur Yaari

11:10 – 11:40

IMGT®: Immunoinformatics Bridges for The Adaptive Immune Responses

Marie-Paule Lefranc, Montpellier University and CNRS

11:40 - 12:10

Repertoire Development: It May Be Stochastic, But Nothing Is Left to Chance!

Andrew Collins, University of New South Wales



12:10 – 12:40	Characterizing Full-length Germline Immunoglobulin Heavy Chain Locus Haplotypes and Variable Gene Diversity in Human Populations Corey T. Watson, University of Louisville School of Medicine
12:40 – 14:00	Lunch
14:00 – 15:45	Tutorial: Repertoire Analysis Jason Vander Heiden, Yale School of Medicine
15:45 – 16:15	Coffee Break 
Session 5:	Chair: Uri Hershberg
16:15 – 16:35	Quantifying the balance of predetermination and stochasticity in the diversity of immune repertoires Victor Greiff, ETH
16:35 – 16:55	Individualized Immunoglobulin Germline Database Production in Multiple Species Martin Corcoran, Karolinska Institute
16:55 – 17:15	Using next generation sequencing data to predict antibody-antigen binding sites in celiac disease Moriah Gidoni, Bar Ilan University
17:15 – 17:35	Insights into immune system development and function from mouse T cell repertoires Yuval Elhanati, Princeton University
17:35 – 17:55	What's Your ("favorite") Antibody? Yariv Wine, Tel Aviv University
18:00 – 20:00	Poster session with snacks



DAY 3: Tuesday 20.6

Session 6: Chair: Andrew Collins

9:00 – 9:30 **All Models Are Wrong, Some Are Useful:
Designing Antibodies Based on Inaccurate Models**
Yanay Ofran, Bar Ilan University

9:30 – 10:00 **Inferring Population Frequency and Dynamics of T-cells
Specific to Common and Rare Antigens from Immune
Repertoire Sequencing Data**
Mikhail Shugay, Institute of Bioorganic Chemistry RAS

10:00 – 10:30 **Are Human TSCM Cell Dynamics in Vivo Compatible with
Long-lived Immunological Memory and Stemness?**
Becca Asquith, Imperial College

10:30 – 11:10 **Coffee Break** 

Session 7: Chair: Yanay Ofran

11:10 – 11:40 **Maximum-entropy Description of Repertoire
Sequencing Data**
Andrea Pagnani, Politecnico di Torino

11:40 – 12:10 **Generation, Selection and Maturation of Healthy
Immune Repertoires**
Thierry Mora, Ecole normale supérieure

12:10 – 12:40 **Regular Administration, Stochastic Response:
Affinity Maturation to Protein Antigens**
Thomas B. Kepler, Boston University School of Medicine



12:40 – 14:00 **Lunch**

14:00 – 16:00 **Tutorial:**

Inferring cellular dynamics from labeling data

Rob de Boer, Utrecht University

15:45 – 16:15 **Coffee Break** 

Session 8: Chair: Uri Hershberg

16:15 – 16:45 **B cell Selection in Development, What Does Repertoire Tell Us?**

Deborah Dunn-Walters, University of Surrey

16:45 – 17:15 **Exploring Antibody Recognition Using High Throughput Binding Data**

Michal Or-Guil, Humboldt University

17:15 – 17:45 **Gene-Specific Substitution Profiles Describe the Types and Frequencies of Amino Acid Changes during Antibody Somatic Hypermutation**

Chaim A Schramm, National Institutes of Health

17:45 – 18:15 **Coffee Break** 

Session 9: Chair: Gur Yaari

18:15 – 18:35 **Ecological Regulation of Immune Self-Tolerance**

Uri Nevo, Sackler School of Medicine



18:35 – 18:55	Exploiting functional B cell repertoire convergence to determine vaccination elicited B cell receptor sequences in silico
	Jean-Philippe Bürkert, Luxembourg Institute of Health
18:55 – 19:15	Molecular determinants of antibody promiscuous binding modes during B-cell differentiation
	Franca Fraternali, King's College London
19:15 – 19:35	Novel Calcium Dependent Mechanisms of NF-κB activation in T cell tolerance and immunity
	Corbett Berry, Drexel University

DAY 4: Wednesday 21.6

Session 10:	Chair: Bartłomiej Swiatczak
9:00 – 9:30	The Abrahamic Nature of Shark Antigen Receptors Martin Flajnik, University of Maryland School of Medicine
9:30 – 10:00	Three time scales in the coevolution of influenza and human immunity Sarah Cobey, University of Chicago
10:00 – 10:30	Following the T cell Repertoire During the Development of Breast Cancer in Mice Sol Efroni, Bar-Ilan University Systems Biomedicine
10:30 – 11:10	Coffee Break 



Session 11:	Chair: Michal Or-Guil
11:10 – 11:40	Navigating the Diversity of Regulatory T cell TCR Repertoire David Klatzmann, Pierre and Marie Curie University
11:40 – 12:10	Clonal Evolution of Human Memory B cell Responses Hedda Wardemann, German Cancer Research Center
12:10 – 12:40	Clone Size Distributions of The Human Naive T cell Repertoire Rob de Boer, Utrecht University
12:40 – 14:00	Lunch
14:00 – 20:00	Tour of the old city and Via Dolorosa
20:00 – 22:00	Dinner at Mishkanot Sha'ananim

DAY 5: Thursday 22.6

Session 12:	Chair: Yoram Louzoun
9:00 – 9:30	How T cell cross-reactivity helps the immune system learn self-nonself discrimination Johannes Textor, Radboud University Medical Centre
9:30 – 10:00	MNKs Switch the Cellular Translatome by Regulating eIF4E1-eIF4E3 Activity Ronald B Gartenhaus, University of Maryland Medical School



10:00 – 10:30	High Resolution Longitudinal Immune Profiling Reveals Immunosenescence Dynamics and an Attractor State Shai Shen-Orr, Technion - Israel Institute of Technology
10:30 – 11:10	Coffee Break 
Session 13:	Chair: Shai Shen-or
11:10 – 11:40	TCR Repertoire Features That Define Specificity in Pathogens and Tumors Paul G. Thomas, St. Jude Children's Research Hospital
11:40 – 12:10	Immune Stimulation of Hematopoietic Stem Cells Roi Gazit, Ben-Gurion University of the Negev
12:10 – 12:40	Data, Data, Everywhere – Embracing the Insights of Complexity to Find Coherence in Big Data Kenneth Buetow, Arizona State University
12:40 – 14:00	Lunch
14:00 – 15:45	Tutorial: Multiscale modeling in multicellular systems Haralampos Hatzikirou, Helmholtz Centre for Infection Research
15:45 – 16:00	Coffee Break 

Session 14: Chair: Ron Gartenhaus

16:00 – 16:30 **Structural Diversity Narrowing Leads to Repertoire overlap in Population**

Yoram Louzoun, Bar Ilan University

16:30 – 17:00 **GARDing the secretory pathway via Golgi quality control**

Yifat Merbl, Weizmann Institute of Science

17:00 – 17:30 **The Individual and Population Genetics of Protective Anti-influenza HA Antibody Responses**

Wayne A. Marasco, Dana-Farber Cancer Institute

17:30 – 18:00 **Coffee Break** 

18:00 – 19:00 **Keynote Speaker:
Hybrid Multiscale Models for Simulating Functional Motion in Macromolecular Complexes**

Michael Levitt, Stanford University

19:00 – 22:00 **Social Drinks**



DAY 6: Friday 23.6

Session 15: Chair: Tomer Hertz

9:00 – 9:30 **Inferring the Dynamics and Topology of Immune Cell Differentiation Pathways**

Thomas Höfer, German Cancer Research Center

9:30 – 10:00 **The Role of Histone-modifying Complexes in Regulating B cell Programs to Infection**

Kim Jacobson, Monash University

10:00 – 10:30 **A Single Molecule View of Immune Cell Activation**

Eilon Sherman, The Hebrew University of Jerusalem

10:30 – 11:10 **Coffee Break** 

Session 16: Chair: Kim Jacobson

11:10 – 11:40 **Effects of Immune History on Immune Responses to Influenza Vaccines**

Tomer Hertz, Ben-Gurion University of the Negev

11:40 – 12:10 **Relationships and Transitions Between B and Plasma cell Populations in SLE Patients Differ from Those in Healthy Controls**

Ramit Mehr, Bar-Ilan University

12:10 – 12:40 **Closing remarks: What shall we ask next in the study of immunobiology?**

Uri Hershberg, Drexel University

