Integrating Critical Phenomena and Multi-Scale Selection in Virus Evolution

Agenda

November 19 – 20, 2018
Noyce Conference Room

Monday, November 19, 2018

8:00
Hotel Santa Fe Shuttle departs to Santa Fe Institute

8:15 – 9:00
Breakfast

9:00 – 9:15
Introduction to the WG topic,
Santiago F. Elena (I²SysBio-CSIC/UV and Santa Fe Institute)

9:15 – 9:45
Single-cell analysis of enterovirus replication dynamics,
Craig E. Cameron (Pennsylvania State University)

9:45 – 10:15
Systems biology of bacteriophage T7,
Claus O. Wilke (University of Texas Austin)

10:15 – 10:30
Coffee Break

10:30 – 11:00
Emergent population dynamic arising from collections of heterogeneously infected cells,
Katia V. Koelle (Emory University)

11:00 – 11:30
Arbovirus population dynamics during mosquito-human transmission cycle,
Raúl Andino (University of California San Francisco)

11:30 – 12:00
Multidimensional scaling of sequence data to infer genotype to phenotype maps of evolving viral populations,
Marco Vignuzzi (Pasteur Institute)

12:00 – 1:30
Lunch

1:30 – 2:00
Quasispecies on adaptive multiscapes: entropy, fitness, and irreversibility in virus evolution,
Susanna C. Manrubia (CBN-CSIC)

2:00 – 2:30
Collective dispersal in viruses,
Rafael Sanjuán (I²SysBio-UV/CSIC)
2:30 – 3:00  Short-sighted viruses,  
Katrina Lythgoe (University of Oxford)

3:00 – 3:30  Copying as creativity: The role of copy number variation in viral adaptation,  
Mark P. Zwart (NIOO-KNAW)

3:30 – 4:00  Evolutionary dynamics of influenza across multiple spatiotemporal scale,  
Katherine Xue (Fred Hutchinson Cancer Research Center)

4:00 – 4:30  Tea Break

4:30 – 5:00  Selection at multiple scales shapes the evolutionary emergence of novel pathogens,  
James O. Lloyd-Smith (University of California Los Angeles)

Tuesday, November 20, 2018

8:00  Hotel Santa Fe Shuttle departs hotel to Santa Fe Institute

8:15 – 9:00  Breakfast at SFI

9:00 – 9:30  Ecological complexity in plant-virus interactions,  
Fernando García-Arenal (CBGP-UPM/INIA)

9:30 – 10:00  Plant-virus interactions in nature: hidden diversity and influence,  
Carolyn M. Malmstrom (Michigan State University)

10:00 – 10:30  Small circular DNA viruses: The muddy viral playground of recombinant, reassortant, and highly diverse viruses,  
Arvind Varsani (Arizona State University)

10:30 – 10:45  Coffee Break

10:45 – 11:15  Viral fitness across a continuum from lysis to latency,  
Joshua S. Weitz (Georgia Institute of Technology)

11:15 – 11:45  Virus-cell interactions and the evolution of disease virulence in bacteria and cancer,  
Paul E. Turner (Yale University)
11:45 – 12:15

How does selection act on the genomic organization of viral populations?

Christopher B. Brooke (University of Illinois Urbana-Champaign)

12:15 – 1:30

Lunch

1:30 – 2:00

The structure of immune diversity in microbial populations,

Rachel J. Whitaker (University of Illinois Urbana-Champaign)

2:00 – 2:30

Integrating the spatial and temporal dynamics of the innate immune response to viral invasions,

Ruian Ke (LANL)

2:30 – 3:00

Within-host dynamics of HIV including effector cell responses,

Alan S. Perelson (LANL and Santa Fe Institute)

3:00 – 4:00

Open discussion. (i) Possibility to apply for NSF RoL EAGER or RAISE grants and (ii) possibility to write a state-of-the-art/review article for Virus Evolution,

David C. Krakauer (Santa Fe Institute), Ricard V. Solé (ICREA/UPF and Santa Fe Institute) and Santiago F. Elena

4:00 – 4:30

Tea break

4:30 – 5:00

Wrap-up and farewell,

Santiago F. Elena

5:15

Hotel Santa Fe Shuttle departs Santa Fe Institute back to Hotel Santa Fe