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**Full Conference Program**

Download the **Guidebook** app in the AppStore to access the full conference program or visit [www.guidebook.com/g/iseec17](http://www.guidebook.com/g/iseec17)
Conference Agenda

Thursday, December 7, 2017 | Mission Palms Hotel

1:00pm - 8:00pm | Registration

1:30pm - 5:00pm | Break Station West
Coffee and refreshments are available

2:00pm - 3:00pm | Evolution Keynote
Paul Turner, Evolutionary robustness of oncolytic RNA viruses

3:00pm - 5:00pm | Session 1
Evolution and Cancer (Chair: Carlo Maley)

 Alexander Anderson, Evolution of cancer metaphenotypes

 Carlo Maley, Resistance Management for Cancer

 James DeGregori, Coevolution of somatic maintenance programs and mutation rates

 Athena Aktipis, How do multicellular bodies ‘decide’ if a cell poses a cancer threat? Cellular information processing is required to effectively solve Peto’s Paradox

 Noemi Andor, The identity of surviving and extinct clones in a longitudinal study of DNA-damage therapy response in gliomas

 Aurora Nedelcu, Exploring the role of selection in shaping cancer’s evolutionary potential and resilience

5:00pm - 6:00pm | Welcome Reception
Wine, beer & appetizers

6:00pm - 7:00pm | Cancer Keynote
Christina Curtis, Quantifying the evolutionary dynamics of therapeutic resistance and metastasis

Dinner on your own
Friday, December 8, 2017 | ASU, Student Pavilion

7:30am - 8:00am | Walk
Walk from Mission Palms Hotel to the ASU Student Pavilion (20 minute walk)

8:00am - 9:00am | Light Breakfast | Room Senita C

8:00am - 6:00pm | Registration

9:00am - 9:45am | Room Senita A
Panel on the Future of Evolution, Ecology and Cancer with Anna Barker (former Deputy Director of the NCI), Alex Sekulic (Mayo AZ Cancer Center Director) and Dan Gallahan (Deputy Director of the Division of Cancer Biology at the NCI), Chair: Carlo Maley

9:45am - 10:45am | Plenary | Room Senita A
Deborah Gordon, *The ecology of collective behavior*

10:45am - 11:00am | Coffee Break | Room Senita C

11:00am - 12:20pm | Parallel Sessions

**Parallel Session 2A | Room Senita A**
Ecosystem robustness/resilience (Chair: Athena Aktipis)

- Frédéric Thomas, *Oncobiota, an underappreciated component of animal evolutionary ecology*

- Beata Ujvari, *Adaptive evolution in the face of a transmissible cancer*

- Michael J. Metzger, *Contagious Clam Cancer: Evolution at the intersection of cancer and infectious disease*

- Chandler Gatenbee, *The Immunogenic Bottleneck: Get Lucky or Get Smart*
Parallel Session 2B | Room Senita B
Cancer Evolutionary Genomics (Chair: Marc Tollis)

Diego Mallo, *PISCA: a new phylogenetic method for the reconstruction of somatic evolution using somatic chromosomal alteration data*

Vincent Cannataro, *The likelihood of heterogeneity or additional mutation in KRAS or associated oncogenes to compromise targeting of oncogenic KRAS G12C*

Luca Ermini, *Evolutionary selection of cancer risk alleles*

Jeffrey Townsend, *Effect sizes of somatic mutations in cancer: calculating the intensity of natural selection*

12:20pm - 1:10pm | Lunch | Senita C

1:10pm - 1:45pm | Poster Flash Talks | Room Senita A
(Chair: Amy Boddy)

1:45pm - 2:45pm | Plenary | Room Senita A
Sunetra Gupta, *Evolution and maintenance of pathogen population structure under immune selection*

2:45pm - 3:00pm | Coffee Break | Room Senita C

3:00pm - 4:00pm | Parallel Sessions

Parallel Session 3A | Room Senita A
Evolution of Therapeutic Resistance (Chair: Carlo Maley)

Jill Gallaher, *Adaptive vs continuous cancer therapy: Exploiting space and trade-offs in drug scheduling*

John Nagy, *A model of natural selection predicts treatment resistance in prostate cancer*

Daniel Nichol, *Stochasticity in the Genotype-Phenotype Map: Implications for the Robustness and Persistence of Bet-Hedging*
Parallel Session 3B | Room Senita B
Evolution of Cancer Suppression Mechanisms/Organism Robustness (Chair: Joshua Schiffman)

Marc Tollis, *Tempo and Mode of Peto's Paradox: A Molecular Evolutionary Approach to Understanding Cancer Suppression*

Benjamin Roche, *Non-oncogenic infectious agents modulate cancer development through alteration of immune responses*

Amy Boddy, *A large-scale evaluation of neoplasia occurrence and life history traits in vertebrates*

4:00pm - 5:30pm | Poster Session & Reception | Room Senita A, C
Wine, beer & appetizers

5:30pm - 6:30pm | Public lecture | Room Senita A
Elizabeth Murchison, *Transmissible cancers in dogs and Tasmanian devils*

7:30pm | Invited Speaker & Program Committee Dinner
House of Tricks - Tempe

Saturday, December 9, 2017 | ASU, Student Pavilion

7:30am - 8:00am | Walk
Walk from Mission Palms Hotel to the ASU Student Pavilion (20 minute walk)

8:00am - 9:00am | Light Breakfast | Room Senita C

8:00am - 6:00pm | Registration

9:00am - 10:00am | Plenary | Room Senita A
Grazyna Jasienska, *Evolution of female reproduction and breast cancer: it was never about the 3 Rs*

10:00am - 10:30am | Coffee Break | Room Senita C

10:30am - 12:30pm | Parallel Sessions
Parallel Session 4A | Room Senita A
Evolution of therapeutic resistance (Chair: Carlo Maley)

Ahmet Acar, *Quantitative Measurements of Treatment Resistance in Non-Small Cell Cancer*

Rob Noble, *Spatial competition constrains resistance to targeted cancer therapy*

Jeffrey Chuang, *Evolutionary Dynamics of Response to Chemotherapies in Breast Cancer Xenografts*

Benjamin Werner, *Forecasting resistance evolution in cancer from liquid biopsies*

Nara Yoon, *Optimal Chemotherapy Scheduling Based on a Pair of Collaterally Sensitive Drugs*

Andriy Marusyk, *Acquired resistance to targeted therapies evolves through gradual, therapy-directed trajectories.*

Parallel Session 4B | Room Senita B
Cell viability in the face of genomic alterations (Chair: Michael Hochberg)

Violet Kovacheva, *Automated nuclear grading of Ductal carcinoma in situ*

Enrico Borriello, *Network duplication reinforces phenotypes by increasing attractor basin sizes*

Kelsey Temprine, *Evolvability in melanoma mediated by DNA polymerase kappa*

Peter J. O’Brien, *A single protein modulates stressed cell resilience*

Henry Heng, *Distinguishing gene mutation mediated micro-cellular evolution from karyotype reorganization mediated macro-cellular evolution in cancer*

Kimberly J. Bussey, *Non-inherited mutation is constrained by genomic evolutionary history in non-intuitive ways*
12:30pm - 2:00pm | Optional Science Writing Workshop with George Johnson in Room Senita A | Lunch in Room Senita C

2:00pm - 3:00pm | Plenary | Room Senita A
Pablo Marquet, *Diversity, transitions and robustness in ecosystems*

3:00pm - 3:30pm | Coffee Break | Room Senita C

3:30pm - 4:30pm | Parallel Sessions

**Parallel Session 5A | Room Senita A**
Theoretical evolutionary biology of robustness (Chair: Amy Boddy)

  - David Basanta, *Define the bone ecosystem: homeostasis and selection in prostate cancer to bone metastasis*
  
  - Weini Huang, *Revealing the evolutionary mechanisms of spatial mixing of sub-clones in tumour by a mathematical model and colorectal tumour samples*
  
  - Dominik Wodarz, *Feedback regulation in cancer: evolutionary dynamics and treatment*

**Parallel Session 5B | Room Senita B**
Cancer prevention as resilience/robustness in the face of somatic challenges (Chair: Aurora Nedelcu)

  - Elena Svenson, *Quantifying the effects of advantageous, deleterious, and neutral passenger mutations on VAF architecture*
  
  - Angelo Fortunato, *Development of novel model organisms in cancer research*
  
  - Pierre Martinez, *Evolution of Barrett’s Esophagus through space and time at single-crypt and whole-biopsy levels*

**4:30pm | Plenary | Room Senita A**
Jake Scott, *Learning and perturbing the evolutionary mechanisms driving therapeutic resistance in cancer*
5:30pm - 6:15pm | ISEEC Business Meeting

6:30pm - 7:00 | Reception | Room Senita C
Wine, beer & appetizers

7:00pm - 9:00pm | Dinner | Mission Palms Hotel

Sunday, December 10, 2017 | Mission Palms Hotel

9:00am - 10:00am | Networking Breakfast

10:00am - 11:00am | Plenary
Inigo Martincorena, *Somatic evolution in normal tissues*

11:00am - 12:00pm | Plenary
Bruce Tabashnik, *Insect resistance to transgenic crops: Lessons from the first billion acres*

12:00pm | Closing Remarks
Closing remarks from Carlo Maley and Athena Aktipis

Posters

To view the full abstracts please download the Guidebook app or visit [www.guidebook.com/g/iseec17](http://www.guidebook.com/g/iseec17).

1. James Cunningham, *Cancer Ecology: A Registry Study of Newly Diagnosed Patients with Cancer from an Ecologic Perspective*

2. Cassandra Balsley, *The Effect of Inbreeding and Life History Traits on the Risk of Cancer Mortality in Dogs*


4. Feng Fu, *Mathematical Models of Combination Cancer Immunotherapy Based on Adoptive Cell Transfer*
5. Chaya Fux, *Optimization of Cell Growth in HYPERFlask for Therapeutic Resistance Selection*

6. Ryan Gutenkunst, *Leveraging tumor mutational spectra when calling genetic variants*

7. Valerie Harris, *Life History, Cancer Incidence, and Cancer Mortality in Non-Human Primates*

8. Tara Harrison, *Risk Factor Modeling of Neoplasia in Madagascar lesser hedgehog tenrecs (Echinops telfairi)*


10. Artem Kaznatcheev, *Dark Selection for resistance without a tumour burden U-curve*


12. Ji Young Li, *Sharks do get cancer*

13. Katherine Lui, *Investigating the eco-evolutionary dynamics of metastasis*

14. Alex May, *Transmissible Cancer and Eusociality: ‘Sharing’ Selfishness with Others*

15. Frederic Mery, *The relationship between cancer progression and social environment in Drosophila*

16. Daria Miroshnychenko and Etienne Baratchart, *Cell fusion mediated parasexual recombination as a novel source of intra-tumor heterogeneity*

17. Aleesa Monaco, *Coevolving cancer hallmarks: The angiogenic switch is modulated by clonal selection on proliferation*
18. Shrinath Narayanan, *Population genetics in oncology*

19. Aurora Nedelcu, *Phenotypic state affects resistance and response to pH changes in a lung cancer cell line*

20. Paul Nelon, *Intercellular Competition and the Inevitability of Cancer, Senescence, and Aging*

21. Javad Noorbakhsh, *Distribution-based measures of tumor heterogeneity are sensitive to mutation calling and lack strong clinical predictive power*

22. Derek Park, *Deep Chemotherapy: Machine-Learned Strategies to Adaptively Manage Chemotherapy and Immune Response*

23. Caspian Robertson, *This Beautiful Monster - an education garden installation at Arizona State University exhibiting the beauty of fasciation in cacti*


25. Tazzio Tissot, *The evolution of resistance and tolerance to cancer*

26. Robert Vander Velde, *Dissecting evolutionary trajectories toward acquired resistance in EML4-ALK lung cancers*

27. Jeffrey West, *Dissemination timing and doubling rate drive selection in metastatic tumors*

28. Marc Williams, *Measuring and predicting evolution evolution in human cancers with genomics*

29. Drew FK Williamson, *Emergence of chemotherapeutic resistance in a evolutionary game theoretic model*

30. Ashley Zehnder, *Development of an online tumor database for zoological and exotic species*
The Biodesign Institute at Arizona State University works to improve human health and quality of life through its translational research mission in health care, energy and the environment, global health and national security. Grounded on the premise that scientists can best solve complex problems by emulating nature, Biodesign serves as an innovation hub that fuses previously separate areas of knowledge to serve as a model for 21st century academic research. By fusing bioscience/biotechnology, nanoscale engineering and advanced computing, Biodesign’s research scientists and students take an entrepreneurial team approach to accelerating discoveries to market. They also educate future generations of scientists by providing hands-on laboratory research training in state-of-the-art facilities for ASU students.

Improving health. Protecting lives. Sustaining our planet.
Mayo Clinic Cancer Center

The Mayo Clinic Cancer Center is a National Cancer Institute-designated comprehensive cancer center with a multisite presence. Its three campuses — in Phoenix, Arizona, Jacksonville, Florida, and Rochester, Minnesota — give the Mayo Clinic Cancer Center a broad geographic reach, enabling it to serve diverse patient populations around the world. The campuses are also home to outstanding, internationally recognized physicians and scientists who collaborate across the full spectrum of cancer research, from basic biology to treatment, as they seek ways to reduce the burden of cancer.

For more information, visit cancercenter.mayo.edu.
ISEEC is partially supported by a generous grant from Genentech.

Genentech is a leading biotechnology company that discovers, develops, manufactures and commercializes medicines to treat patients with serious or life-threatening medical conditions. They are among the world’s leading biotech companies, with multiple products on the market and a promising development pipeline.

Considered the founder of the industry, Genentech, now a member of the Roche Group, has been delivering on the promise of biotechnology for over 40 years.
Confronting the big questions

How did the universe begin?  
Is time travel possible?

Are we alone in the universe?

What is cancer and how do we fix the problem?

Can we communicate with aliens?

Where do the laws of nature come from?

How did life begin?

What is the destiny of mankind?

To learn more visit our website Beyond.asu.edu

Facebook.com/BeyondCenter/  
Twitter.com/Beyond_ASU  
Youtube: Beyond Center
ASU Parking

Getting Around
Walking is the quickest and most efficient way of getting around campus and to and from the meeting locations.

Campus Parking
The nearest parking garage to the Student Pavilion is the Apache Boulevard Parking Garage located at 401 E. Lemon Street, Tempe, AZ 85287

Automated pay machines accept MasterCard, Visa and $1, $5, $10 and $20 bills and give change. Pay machines in exit lanes accept MasterCard and Visa only. Accessible spaces available in every lot. 1 hr or less: $3

1-2 hrs: $6
2-3 hrs: $9
3-4 hrs: $12
4+ hrs: $15 (Also the charge for a lost ticket)

No Visitor Motorcycle Parking
Visitor motorcyclists may park in any available metered space or vehicle stall on visitor lots, but must pay the posted rate.
ISEEC Membership

When you become a member, you become part of larger conversation that includes a multi-disciplinary approach to an intractable problem. Where else can you have access to people who are thinking deeply and creatively about the evolution and ecology of cancer? Where else can you share information with practitioners and thinkers from a variety of disciplines who might have new ways of thinking about the problem of cancer?

The mission of the International Society for Evolution, Ecology and Cancer is to advance cancer research and clinical management by employing evolutionary, comparative and ecological approaches and principles to cancer biology, prevention, and treatment. By bringing together cancer biologists, evolutionary biologists, ecologists, quantitative modelers, bioinformaticians and clinicians, the society seeks to enable collaboration at the interface of these fields, the exchange of research findings, novel methodologies and theoretical frameworks across disciplines. ISEEC supports education and outreach efforts to train the next generation of scientists in the evolution and ecology of cancer, as well as engaging the public in fundamental questions about the nature and evolutionary origins of cancer.

Becoming a member supports future conferences. Members also save on registration fees for ISEEC biannual meetings.

To become a member visit www.iseec.org.

ISEEC Committee

ISEEC Committees are now forming to help support the mission of the society. To see a list of the existing committees, visit www.iseec.org.

To sign up for a committee, you can either stop by the registration table, where the sign up sheets are available, or you can email us at evocancer@gmail.com.
The theme of this year’s ISEEC conference is “Resistance, Resilience and Robustness” and focuses on the evolutionary and ecological processes underlying cancer. During cancer progression and treatment, cancer has the capacity to exhibit resistance, resilience and robustness. Further, organisms have evolved defenses against cancer that increase the robustness of bodies to mutations and other perturbations that can increase cancer susceptibility. Considering cancer and cancer defenses through the lens of resilience and resistance can help identify challenges and opportunities in cancer therapy and new horizons for cancer prevention.

The official hashtag for ISEEC 2017 is #ISEEC17

Download the Guidebook app in the AppStore to access the full conference program or visit www.guidebook.com/g/iseec17

ISEEC 2017 is the fourth biannual conference of the International Society for Evolution, Ecology and Cancer.

www.iseec.org  @EvoCancer

Arizona State University  Mayo Clinic Cancer Center
Genentech  Beyond Center