B01 A novel murine platform for genetic-driven translational prostate cancer research. Marco Bezzi¹, Ioannis Vlachos¹, Meredith Omer², Caitlin A. Mitchell², John Clohessy¹, Pier Paolo Pandolfi¹. ¹Harvard Medical School-Beth Israel Deaconess Medical Center, Boston, MA, ²Beth Israel Deaconess Medical Center, Boston, MA.

B02 An analytical method for solving 3-strategy evolutionary games in cancer. Patrick J. Ellsworth¹, Artem Kaznatcheev², Jacob G. Scott³. ¹Case Western Reserve University School of Medicine, Cleveland, OH, ²University of Oxford, Oxford, United Kingdom, ³Translational Hematology and Oncology Research Cleveland Clinic, Cleveland, OH.

B03 Systemic dynamics of multiple metastases during adaptive therapy. Jill A. Gallaher, Alexander R.A. Anderson. Moffitt Cancer Center, Tampa, FL.

B04 Developing adaptive therapy to suppress the evolution of treatment resistance in high-grade serous ovarian cancer. Helen Hockings¹, Weini Huang², Stephen Metcalf¹, Eszter Lakatos¹, Maximilian Mossner¹, Trevor Graham¹, Michelle Lockley¹. ¹Barts Cancer Institute, London, United Kingdom, ²Queen Mary University of London, London, United Kingdom.

B05 Modeling phenotypic heterogeneity towards evolutionary inspired osteosarcoma therapy. Elliot J. Kahen, Darcy Welch, Damon Reed. Moffitt Cancer Center, Tampa, FL.

B06 Patient-specific adaptive therapies for metastatic melanoma. Eunjung Kim¹, Joel Brown², Zeynep Eroglu², Alexander Anderson². ¹Chungnam National University, Daejeon, Korea, ²Moffitt Cancer Center, Tampa, FL.

B07 Using antagonistic pleiotropy to design a chemotherapy-induced evolutionary trap. Kevin H. Lin¹, Justine C. Rutter¹, Abigail Xie³, Emily Winn³, Bryann Pardieu⁴, Reinaldo Dal Bello³, Raphael Itzykson⁵, Yeong-Ran Ahn¹, Grace R. Anderson¹, Lorin Crawford², Alexandre Puissant⁶, Kris C. Wood⁷. ¹Duke University, Durham, NC, ²Brown University, Providence, RI, ³Institut de Recherche Saint Louis, Paris, France.

B08 Redefining therapy regimens for triple-negative breast cancer: Exploiting the epigenetic effects of eribulin action. Meisam Bagheri, Gadisti Aisha Mohamed, Nevena B. Ognjenovic, Diwakar R. Pattabiraman. Dartmouth College, Hanover, NH.

B09 Translation evolutionary concepts of extinction and adaptive therapy in newly diagnosed, metastatic rhabdomyosarcoma. Damon Reed¹, Jonathan Metts², Matteo Trucco³, Lars Wagner⁴, Michael Isakoff⁵, Masanori Hayashi⁶, Ryan Roberts⁷, Rikesh Makanji³, Robert Gatenby¹, Joel Brown¹. ¹Moffitt Cancer Center, Tampa, FL, ²Johns Hopkins All Children's Hospital, St. Petersburg, FL, ³Cleveland Clinic,
B10 Enabling evolutionary therapy through evolutionary control: Timescales, trajectories, and outcomes. Shamreen Iram, Emily Dolson, Joshua Chiel, Julia Pelesko, Nikhil Krishnan, Ozenc Gungor, Benjamin Kuzeits-Speck, Sebastian Defner, Efe Ilker, Jacob G. Scott, Mike Hinczewski. 1Case Western Reserve University, Cleveland, OH, 2Cleveland Clinic, Cleveland, OH, 3University of Maryland, Baltimore, MD, 4Institute Curie, Paris, France.

B11 Nanotherapeutic targeting of MEK and FGFR1 inhibitors mitigates drug toxicities and resistance. Ramya Sridharan, Janki Shah, Yosef Shamay, Danile A Heller. 1Weill Cornell University, Memorial Sloan Kettering Cancer Center, New York, NY, 2Memorial Sloan Kettering Cancer Center, New York, NY, 3Technion-Israel Institute of Technology, Haifa, Israel.

B12 Cost or no cost? The role of cost of resistance in adaptive cancer therapy. Maximilian Strobl, Jeffrey West, Mehdi Damaghi, Robert Gillies, Robert Wenham, Philip Maini, Alexander Anderson. 1University of Oxford, Oxford, Oxfordshire, United Kingdom, 2Moffitt Cancer Center, Tampa, FL.

B13 Manipulating selection to slow the evolution of weak resistance and prevent the evolution of strong resistance. Robert Vander Velde, Mark Robertson-Tessi, Alexander Anderson, Andriy Marusyk. Moffitt Cancer Center, Tampa, FL.

B14 Antifragile Cancer Therapy. Jeffrey West, Maximilian Strobl, Alexander R.A. Anderson. Moffitt Cancer Center, Tampa, FL, USA.

B15 Adaptation and selection shape clonal evolution during residual disease and recurrence. Andrea Walens, Jiaxing Lin, Jeremy Grisham, Piotr Mieczkowski, Kouros Owzar, James V. Alvarez. 1Duke University School of Medicine, Durham, NC, USA, 2University of North Carolina - Chapel Hill, Chapel Hill, NC, USA.

B16 Dynamic precision medicine (DPM): An approach to evolutionary-guided cancer therapy. Robert A. Beckman, Rebecca Riggins, Mircea Podar, Jin Y. Yang, Matthew McCoy, Deepak Parashar, Chen-Hsiang Yeang. 1Georgetown University Medical Center, Washington, DC, United States, 2Oak Ridge National Laboratory, Oak Ridge, Tennessee, United States, 3University of Warwick, Warwick, United Kingdom, 4Academia Sinica, Taipei, Taiwan.

B17 Extensive subclonal mutational diversity in human colorectal cancer (CRC) and its significance. Lawrence A. Loeb, Brendan F. Kohn, Kaitlyn J. Loubet-Seneear, Yasmin J. Dunn, Eun H. Ahn, Jacintha N. O'Sullivan, Jesse J. Salk, Mary P. Bronner, Robert A. Beckman. 1University of Washington, Seattle, Washington, United States, 2University College Dublin, Dublin, Ireland, 3TwinStrand Biosciences, Seattle, Washington, United States, 4University of Utah, Salt Lake City, Utah, United States, 5Georgetown University, Washington, District of Columbia, United States.

B18 An integrated computational and experimental framework for studying the effects of microenvironmental heterogeneity on evolutionary dynamics and therapy response. Mina Dinh, Emily Dolson, Masahiro Hitomi, Jacob Scott. Cleveland Clinic, Cleveland, Ohio, USA.

Marnix Jansen, Manuel Rodriguez-Justo, Christopher J. Whelan, Andrea Sottoriva, Simon Leedham, Mark Robertson-Tessi, Trevor A. Graham, Alexander R.A. Anderson. 1Moffitt Cancer Center, Tampa, USA, 2Barts Cancer Institute, London, UK, 3Wellcome Centre for Human Genetics, Oxford, UK, 4Lyon Cancer Institute, Lyon, France, 5University College London Hospital, London, UK, 6Institute of Cancer Research, London, UK.

B20 Obesity promotes B-ALL pathogenesis which can be overcome through galecin inhibition. Miyoung Lee, Jamie A. G. Hamilton, Ganesh R. Talekar, Langston Michael, Anthony J. Ross, Manali Rupji, Bhakti Dwivedi, Christopher D. Scharer, Jeremy Boss, Douglas K. Graham, Deborah DeRyckere, Christopher C. Porter. 1Emory University School of Medicine, Atlanta, GA, USA, 2Wake Forest University School of Medicine, Winston-Salem, NC, USA, 3Emory University School of Medicine, Atlanta, GA, USA.

B21 Multimodal integration of scRNA-seq and longitudinal treatment-response data into a mathematical model of chemotherapeutic resistance dynamics. Kaitlyn E. Johnson, Grant R. Howard, Daylin Morgan, Eric Brenner, Andrea L. Gardner, Russ Durrett, William Mo, Aziz Al’Khafaji, Angela M. Jarrett, Eduardo D. Sontag, Thomas E. Yankeelov, Amy Brock. 1The University of Texas, Austin, TX, USA, 2The Broad Institute, Cambridge, MA, USA, 3Northeastern University, Boston, MA, USA.

B22 Uncovering the dynamic influence of histone lysine demethylases in therapy-induced phenotype switching and cell heterogeneity in BRAFV600E-mutant melanoma cells. Mehwish Khalig, Mohann Manikkam, Mohammad Fallahi-Sichani. University of Michigan, Ann Arbor, USA.


B24 Regenerable altruism drives chemotolerance in cancer cells via epigenetics. Muhammad Sufyan bin Masroni, Kee Wah Lee, Steven Tucker, Lynette Su-Mien Ngo, Zehhao Liu, Yuen Peng Tan, Min En Nga, Soo Yong Tan, Boon Huat Bay, Qingsong Lin, Lihan Zhou, Thomas Choudary Putti, Victor Kwan Min Lee, Mikael Hartman, Tze Ping Loh, Manikandan Lakshmanan, George Wai Cheong Yip, Sook Yee Lee, Susan Swee Shan Hue, Huwen Chua, Mo-Huang Li, Marco Archetti, Karen Mei-Ling Tan, Evelyn Siew-Chuan Koay, Sai Mun Leong. 1National University of Singapore, Singapore, 2Tucker Medical Pte Ltd, Singapore, 3Raffles Hospital, Singapore, 4National University Hospital Singapore, Singapore, 5MiRXES Pte Ltd, Singapore, 6Institute of Molecular and Cell Biology, Singapore, 7CellSievo Pte Ltd, Singapore, 8Pennsylvania State University, PA, USA.

B25 Androgen deprivation therapy promotes neuroendocrine differentiation and angiogenesis through CREB-EZH2-TSP1 pathway in prostate cancers. Yan Zhang, Dayong Zheng, Ting Zhou, Ladan Fazli, Michael Ittmann, Martin Gleave, Wenliang Li. 1Institute of Molecular Medicine, University of Texas Health Science Center at Houston, Houston, TX, USA, 2Department of Urologic Sciences and Vancouver Prostate Centre; University of British Columbia, Vancouver, BC, Canada, 3Department of Pathology and Immunology, Baylor College of Medicine, Houston, TX, USA.

B26 Acquired resistance to immune checkpoint blockade by phenotypic plasticity of melanoma. Arnav Mehta, Emily J. Robitschek, Dennie T. Frederick, Alvin Shi, Ana B. Larque, Benchun Miao, Rumya S.
B27 Single cell RNA sequencing of colorectal cancer organoid cells after chemotherapy reveals a trajectory for regrowth states of residual cancer cells. Kiyotaka Nakano¹, Takanori Fujita², Shigeto Kawai², Genta Nagae³, Masami Suzuki¹, Hiroyuki Aburatani². ¹Forerunner Pharma Research Co., Ltd., Tokyo, Japan, ²The University of Tokyo, Tokyo, Japan.

B28 Cyclin Dependent Kinase 4/6 as a therapeutic target in Glioblastoma. Oluwademilade O. Nuga¹, Artem Berezovsky¹, Kevin Nelson², Ana C deCarvalho³. ¹Wayne State University, School of Medicine / Henry Ford Hospital, Detroit, MI, USA, ²Henry Ford Hospital, Detroit, MI, USA, ³Henry Ford Hospital/Wayne State University School of Medicine, Detroit, MI, USA.

B29 Clonal evolution of the KRAS mutation in colorectal carcinoma. Rana Ramadan¹, Kristiaan Lenos¹, Sanne van Neerven¹, Koen Oost², Hugo Snippert³, Louis Vermeulen¹. ¹Amsterdam UMC, Amsterdam, The Netherlands, ²Nederlands Kanker Institute, Amsterdam, The Netherlands, ³Utrecht UMC, Utrecht, The Netherlands.


B31 Stress mediated translational control of cell plasticity and metastatic capacity. Amal El-Naggar¹, Syam Somasekharan², Yemin Wang¹, Martin Gleave², David Huntsman¹, Gregg Morin³, Chris Hughes³, Poul Sorensen¹. ¹BCCRC, Vancouver, BC, Canada, ²Vancouver Prostate Centre, Vancouver, BC, Canada, ³Genome Science Centre, Vancouver, BC, Canada.

B32 Enzalutamide-induced PTH1R-mediated TGFBR2 decrease in osteoblasts contributes to resistance in prostate cancer bone metastases. Shang Su¹, Jingchen Cao¹, Xiangqi Meng¹, Ruihua Liu¹, Alexander VanderArk¹, Erica Woodford¹, Reian Zhang¹, Isabelle Stiver¹, Xiaotun Zhang², Zachary Madaj¹, Megan Bowman¹, Yingying Wu³, H. Eric Xu¹, Bin Chen³, Haiquan Yu², Xiaohong Li¹. ¹Van Andel Institute, Grand Rapids, Michigan, United States, ²Mayo Clinic, Rochester, United States, ³Michigan State University, Grand Rapids, Michigan, United States, ⁴Shanghai Institute of Materia Medica, Chinese Academy of Sciences, Shanghai, China, ⁵Inner Mongolia University, Hohhot, China.

B33 Inactivation of AKT-S6 signaling potentiates radiotherapy efficacy in head and neck squamous cell carcinoma. Liwei Lang¹, Fang Wang¹, Tiffany Lam¹, Alex Chen¹, Chloe Shay², Yong Teng¹. ¹Augusta University, Augusta, USA, ²Emory University, Atlanta, USA.

B34 Co-delivery of nanoparticle-conjugated saracatinib/capivasertib overcomes the resistance of Src inhibition in oral squamous cell carcinoma. Liwei Lang¹, Xiangdong Zhao¹, Yuanping Xiong¹, Chloe Shay², Yong Teng¹. ¹Augusta University, Augusta, USA, ²Emory University, Atlanta, USA.

B35 Live cell gene-essentiality assay reveals cancer cells can adapt to autophagy inhibition via upregulated NRF2 signaling and mitochondrial fusion. Christina G. Towers³, Brent E. Fitzwalter¹, Darya
K. Wodtzi, Dan Regan, Michael J. Morgan, Andrew Goodspeed, James Costello, Katharine R. Smith, Chang-wei Liu, Cecilia Caino, Daniel Gustafson, Andrew Thorburn. 1University of Colorado AMC, Aurora, CO, USA, 2Colorado State University, Fort Collins, CO, USA.

**B36 Computational modeling of evolution in tumor cell populations shows differences in the symmetry of resistance after treatment with synergistic or antagonistic drug combinations.** Elysa C. Saputra, Vivek Murali, Lisa Tucker-Kellogg. 1Duke-NUS Medical School, Singapore, Singapore, 2National University of Singapore, Singapore, Singapore.

**B37 Modeling the evolution of ploidy in a resource restricted environment.** Gregory Kimmel, Jill Barnholtz-Sloan, Philipp Altrock, Noemi Andor. 1Integrated Mathematical Oncology, Moffitt Cancer Center, Tampa, Florida, USA, 2Case Comprehensive Cancer Center and Cleveland Institute for Computational Biology, Case Western Reserve University School of Medicine, Cleveland, Ohio, USA.

**B39 Group selection and habitats to stratify DCIS progression.** Mehdi Damaghi, Hidetoshi Mori, Alexander D Borowsky, Robert J Gillies. 1Moffitt Cancer Center, Tampa, Florida, USA, 2UC Davis, School of Veterinary Medicine, Davis, California, USA, 3UC Davis, School of Medicine, Pathology and Laboratory Medicine, Davis, California, USA.

**B40 Impact of cancer associated fibroblast mediated stromal protection on evolution of resistance to targeted therapies in NSCLC.** Bina Desai, Anna Miller, David Basanta, Andriy Marusyk. 1Moffitt Cancer Center/University of South Florida, Tampa, Florida, USA, 2Moffitt Cancer Center, Tampa, Florida, USA.

**B41 Tracing the origin and evolution of intestinal metaplasia in the chronically inflamed stomach.** William Waddingham, Will Cross, Kit Curtius, Khaled Dhawas, Mohammadi Borzoueh, Andrew Jenkinson, David Graham, Matthew Banks, Shigeki Sekine, Marnix Jansen. 1UCL Cancer Institute, London, UK, 2Barts Cancer Institute, London, UK, 3UCLH NHS Trust, London, UK, 4National Cancer Center Hospital, Tokyo, Japan.

**B42 Investigating aneuploidy in inflammatory bowel disease-associated cancer evolution.** Blake A. Johnson, Yi Dong, Taibo Li, Rong Li. Johns Hopkins School of Medicine Center for Cell Dynamics, Baltimore, MD, USA.

**B43 Modeling the bone ecosystem and environmental selection in multiple myeloma.** Anna K. Miller, Ryan T. Bishop, Conor C. Lynch, David Basanta. H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL, USA.

**B44 Robustness and performance trade-offs in reward models during reinforcement learning of optimized personalized chemotherapy.** Derek S. Park, Philip K. Maini, Michael B. Bonsall, Alexander R. A. Anderson. 1H. Lee Moffitt Cancer Center, Tampa, FL, USA, 2University of Oxford, Oxford, United Kingdom.

**B45 Understanding how age-dependent inflammation can lead to oncogenic adaptation in lung cancer.** Catherine Pham-Danis, Hannah Scarborough, Nathaniel Little, Travis Nemkov, Jessica Christenson, Nicole Spoelstra, Angelo D’alessandro, Jennifer Richer, Kirk Hansen, James DeGregori. University of Colorado, Anschutz Medical Campus, Aurora, CO, USA.
Untangling the complex interplay between cancer metabolism and immune predation using evolutionary principles. Jeffrey West, Casey Adam, Diego Montoya, Mark Robertson-Tessi, Alexander Anderson. Moffitt Cancer Center, Tampa, FL, USA.

Roles for intracellular pH heterogeneity in cancer cell behaviors. Julia Spear, Katharine A. White. University of Notre Dame, South Bend, IN, USA.

A novel RNA sequencing-based prognostic nomogram to predict survival for patients with cutaneous melanoma. Yuan Zhang¹, Jun Tian², Ye Yang³. ¹Department of Oncology, Shanxi Provincial People's Hospital, Xi'an, Shannxi, China, ²Department of Dermatology, Shanxi Provincial People’s Hospital, Xi’an, China, ³Department of Dermatology, 63600 Hospital of PLA, Lanzou, China.