

**1st International Workshop on  
Tumor evolution and heterogeneity of the cancer genome:  
challenges and opportunities for precision medicine**  
*IRCCS Regina Elena National Cancer Institute*  
*Multimedia Congress Center - Via Fermo Ognibene, 23*

**Rome, March 22-23 2018**

Clonal selection is a major mechanism through which tumor cells succeed in adapting to severe environmental changes and in maintaining their fitness. This Darwinian process of tumor evolution is bound to generate heterogeneous profiles of driver mutations within a single lesion and across different lesions in any individual patient (intra-tumor heterogeneity). On the other hand, tumors with the same histotype isolated from different patients may differ substantially in their profile of genetic drivers (inter-tumor heterogeneity) but yet share relatively homogeneous gene expression profiles and, predictably, unique biological and clinical features inherent to those shared transcriptional programs. These compound patterns of tumor heterogeneity pose a potential challenge to the notion of precision cancer medicine predicated solely upon therapeutic targeting of a unique genetic driver in any individual patient. The aim of this workshop is to critically appraise these emerging issues by a) presenting a state of the art view of cancer genomic heterogeneity; b) illustrating how this knowledge can be effectively leveraged for pharmacological tumor targeting in the clinic; c) showcasing examples of how computational systems biology and functional genomics can be exploited for identifying novel functional dependencies in cancer cells.

## THURSDAY, MARCH 22

**14.20** Welcome address by **Francesco Ripa di Meana** (*General Director IFO, Rome, Italy*) and **Gennaro Ciliberto** (*Scientific Director, IRCCS Regina Elena National Cancer Institute, Rome, Italy*)

### 1ST SESSION

**CHAIRS: GENNARO CILIBERTO - PIER GIUSEPPE PELICCI**

**14.30** Identifying and targeting critical cancer vulnerabilities (**Giulio Draetta**, *Sewell Family Chair, Department of Genomic Medicine, Division of Cancer Medicine, The University of Texas, MD Anderson Cancer Center, Houston, USA*)

**15.05** Cancer evolutionary dependencies (**Giovanni Ciriello**, *Department of Computational Biology, University of Lausanne, Switzerland*)

**15.40** Measuring cancer evolution in individual patients using genomic data (**Andrea Sottoriva**, *Centre for Evolution and Cancer, The Institute of Cancer Research, Sutton, UK*)

**16.15** Break

**16.40** Cancer evolution as a therapeutic target (**Alberto Bardelli** *University of Torino, School of Medicine, IRCCS Candiolo, Italy*)

**17.15** How to tackle constantly marker altering breast cancer strategies for precision medicine (**Jonas Bergh**, *Department of Oncology-Pathology, Karolinska Institute, Stockholm, Sweden*)

**17.50** Elucidating and targeting mechanisms of cancer cell state maintenance (**Andrea Califano**, *Department of Systems Biology and Institute for Cancer Genetics and Herbert Irving Comprehensive Cancer, Columbia University, New York City, NY, USA*).

**18.25** Summary by **Pier Giuseppe Pelicci** (*Department of Experimental Oncology, IRCCS European Institute of Oncology IEO, Milan, Italy*) and Discussion led by **Gennaro Ciliberto and Pier Giuseppe Pelicci**

## FRIDAY, MARCH 23

### 2ND SESSION

**CHAIRS: ANNA SAPINO - MICHELE MILELLA**

**9.15** The molecular basis of oncology therapeutic development (**Andrew Biankin**, *Wolfson Wohl Cancer Research Centre, Institute of Cancer Sciences, University of Glasgow, UK*)

**09.50** Implementing precision medicine in lung cancer: **Where are we? Where are we going?** (**Emilio Bria**, *Medical Oncology, Department of Medicine, University of Verona, Italy*)

**10.25** Functional genomics approaches using organoid models of cancer (**Mathew Garnett**, *Wellcome Trust Sanger Institute, Wellcome Trust Genome Campus, Hinxton, Oxford, UK*)

**11.00** Break

**11.25** Modelling metastatic melanoma *in vivo* to target pathways involved in dissemination (**Luisa Lanfrancone**, *Target Identification and Validation Unit, IRCCS European Institute of Oncology IEO, Milan, Italy*)

**12.00** Bench at bedside: targeted therapies for distinct patient populations (**M. Emilia Di Francesco**, *Institute for Applied Cancer Science at MD Anderson Cancer Center, Houston, USA*)

**12.20** Clinical Trial designs evaluating precision medicine in oncology (**Christophe Le Tourneau**, *Head of Clinical Research Department of Medical Oncology Institute Curie, Paris, France*)

**12.55** Summary by **Michele Milella** (*Medical Oncology, IRCCS Regina Elena National Cancer Institute, Rome, Italy*) and Discussion led by **Michele Milella and Anna Sapino** (*University of Turin, School of Medicine and IRCCS Candiolo, Italy*)

**13.10** Concluding Remarks (**Ruggero De Maria**, *President of the Alliance Against Cancer, Rome, Italy*)

**13:30** Farewell Address: **Gennaro Ciliberto**