



Introduction:

Metastasis is the main driving force for cancer-associated lethality as they are more difficult to treat than primary tumors. The exponential increase in heterogeneity throughout the metastatic cascade and the underlying biology that involves the generation of novel ecosystems incorporating resident and peripheral components of the microenvironment might explain the increased ability to resist therapies. The CNIO-CaixaResearch Frontier meeting will provide the most up-to-date perspective on metastasis including the best ways to model metastasis, embrace its heterogeneity, prevent metastases from happening, exploit organ-specific survival mechanism of cancer cells among other key topics. These novel research findings will be contributed by leaders in the field, which will make the CNIO-CaixaResearch Frontier Meeting on Metastasis the most relevant cancer research forum of the year.

Topics to be covered:

- Modelling Evolution of Metastasis
- Non-Genetic Adaptation in Metastasis (Metabolism, Epigenetics and Stress)
- Microorganismal Influence on Metastasis
- Anti-Metastasis Therapies and Clinical
- Influence of Microenvironment in Metastasis
- CTCS/ DTC/ CTDNA: New Technologies and Implications
- Neurobiology of Metastasis

Agenda

Monday November 6th, 2023

From 9.00 to 6.45 pm (coffee breaks, lunch, and light dinner included)

08.30 – 09.00 Registration

09.00 – 09.15 Welcome

Session 1. **Modelling Evolution of Metastasis**

Chair: Héctor Peinado

- 09.15 – 09.45 How do dormant tumor cells evade immune recognition, and what can we do about it?
Cyrus Ghajar, Fred Hutchinson Cancer Center, US
- 09.45 – 10.00 Short talk: Deconstructing immunity of breast cancer micrometastasis
Toni Celiá-Terrassa, Hospital del Mar Research Institute, Spain
- 10.00 – 10.15 Short talk: RET overexpression leads to increased brain metastatic competency in luminal breast cancer
Petra Jagušť, RCSI, University of Medicine and Health Sciences, Ireland
- 10.15 – 10.30 Short talk: Inactivation of p53 drives breast cancer brain metastasis by altering fatty acid metabolism
Uri Ben-David, Tel Aviv University, Israel
- 10.30-11.00 Coffee break & poster session (social room)
- 11.00 – 11.30 Why liver metastases undermine immunotherapy
Erik Sahai, The Francis Crick Institute, UK
- 11.30 – 12.00 Studying melanoma evolution one cell at the time
Jean-Christophe Marine, Leuven Center for Cancer Biology, Belgium
- 12.00 – 12.15 Short talk: Metastatic colonization requires a proliferative pause linked to vascular co-option
Pedro García Gómez, Spanish National Cancer Research Centre, Spain

12.15-13.45 Lunch break (cafeteria)

Session 2. **Non-Genetic Adaptation in Metastasis (Metabolism, Epigenetics and Stress)**

Chair: María Caffarel

- 13.45 – 14.15 Nutrient dependencies of metastasis formation
Sarah María Fendt, VIB KU Leuven Center for Cancer Biology, Belgium
- 14.15 – 14.45 Systemic and epigenetic influences of metastatic cells on host metabolism
Salvador Aznar-Benitah, Institute of Biomedical Research (IRB), Spain

14.45 – 15.00 Short talk: Impact of obesity in breast cancer pre-metastatic niche formation
Marta Hergueta, Spanish National Cancer Research Centre, Spain

15.00 – 15.30 The bone marrow niches as targets and sources of metastases
Xiang H-F Zhang, Baylor College of Medicine, US

15.30-16.00 Coffee break & poster session (social room)

Session 3. **Microorganismal Influence on Metastasis**

Chair: Caroline Dive

16.00 – 16.30 Microbiota in cancer progression and metastasis
Maria Rescigno, Humanitas University, Italy

16.30 – 17.00 Tumor resident bacteria promote metastatic colonization and immune evasion in breast cancer
Shang Cai, Westlake University, China

17.00 – 17.30 Tumor-targeted delivery of a neoantigen surrogate by listeria reduces pancreatic cancer
Claudia Gravekam, Albert Einstein College of Medicine, US

17.30 – 19.30 Poster session with light dinner (social room)

Tuesday November 7th, 2023

From 9.00 to 5.00 pm (coffee breaks, lunch, and networking snacks included)

Session 4. **Anti-metastasis therapies and clinical efforts**

Chair: Eva González

09.00 – 09.30 Capturing and exploiting cancer cell metabolic plasticity in the leptomeninges
Adrienne Boire, Memorial Sloan Kettering Cancer Center, US

09.30 – 10.00 Stem cells, immune evasion and metastasis in colorectal cancer
Eduard Batlle, Institute of Biomedical Research (IRB), Spain

10.00 – 10.15 Short talk: Immunotherapy-induced blood brain barrier (BBB) opening:
Implications for combination drug scheduling
Abhilash Nitin Deo, Technion - Israel institute of Technology, Israel

10.15 – 10.30 Short talk: TIMP1 mediates astrocyte-dependent local immunosuppression in brain metastasis acting on infiltrating CD8+ T cells
Neibla Priego, Spanish National Cancer Research Centre, Spain

10.30-11.15 Group picture (main door) coffee break & poster session (social room)

- 11.15 – 11.45 Tackling metastases as cellular ecosystems
Carlos Caldas, Cancer Research UK Cambridge Institute, UK
- 11.45 – 12.15 Immune-mediated regulation of breast cancer metastatic outgrowth
Alana Welm, The University of Utah, US

12.15-13.45 Lunch break (cafeteria)

Session 5. Influence of Microenvironment in Metastasis

Chair: Julio Aguirre-Ghiso

- 13.45 – 14.15 NETworking in cancer: bidirectional interactions between cancer and neutrophil extracellular traps (NETs) as regulators of metastasis
Mikala Egeblad, Cold Spring Harbor Laboratory, US
- 14.15 – 14.30 Short talk: Macrophage-fibroblast JAK/STAT dependent crosstalk promotes liver metastatic outgrowth in pancreatic cancer
Meirion Raymant, University of Liverpool, UK
- 14.30 – 14.45 Short talk: In vivo screening of tumor-hepatocyte interactions identifies Plexin B2 as a gatekeeper of liver metastasis
Constanza Borrelli, ETH Zurich, Switzerland

14.45 – 16.45 Coffee break & poster session (social room)

- 16.45 – 17.00 Short talk: RANK pathway inhibition impairs immunosuppression in macrophages enhancing the anti-tumour response
Alexandra Barranco, Spanish National Cancer Research Centre, Spain
- 17.00 – 17.15 Short talk: MAF amplification licenses Estrogen Receptor α to drive breast cancer bone metastasis
Roger Gomis, Institute for Research in Biomedicine, Spain
- 17.15 – 17.45 Microenvironmental Regulation of Metastasis
Johanna Joyce, Ludwig Institute for Cancer Research, Switzerland

19:30 Social event (casual dress code)

Wednesday November 8th, 2023

From 9.00 am to 1.45 pm (coffee break and lunch included)

Session 6. CTCS/ DTC/ CTDNA: New Technologies and Implications

Chair: Paloma Bragado

- 09.00 – 09.30 Circulating Tumour Cells and Lung Cancer Metastasis
Caroline Dive, Cancer Research UK Cambridge Institute, UK
- 09.30 – 10.00 Circulating tumor cell clusters
Nicola Aceto, Institute of Molecular Health Sciences (IMHS), Switzerland

10.00 – 10.15 Short talk: Circulation-on-a-Chip: Cell Survival Under Pro-Apoptotic Mechanical Cues in Metastasis
Marc Rico-Pasto, University of Barcelona, Spain

10.15 – 10.45 Age-related clonal hematopoiesis as a host-derived driver of lung metastasis in breast cancer
Julio Aguirre-Ghiso, Albert Einstein College of Medicine, US

10.45-11.15 Coffee break (social room)

Session 7. **Neurobiology of Metastasis**

Chair: Manuel Valiente

11.15 – 11.45 Targeting neural signalling to prevent relapse after cancer treatment
Erica Sloan, Monash University, Australia

11.45 – 12.15 The Neurobiology of Brain Metastasis
Frank Winkler, University Hospital Heidelberg and DKFZ, Germany

12.15 – 12.30 Short talk: Gap-Junction mediated calcium oscillations drive melanoma brain metastasis progression
Nils Hebach, U. Hospital Heidelberg / German Cancer Research Institute, Germany

12.30 – 13.00 The neural regulation of brain metastases
Humsa Venkatesh, Dana-Farber/Harvard Cancer Center, US

13.00 – 13.30 Neural basis for blunted circadian glucocorticoid rhythms in breast cancer
Jeremy Borniger, Cold Spring Harbor Laboratory, US

13.30-13.45 Best posters and short talks prizes

13.45 Closing remarks

Lunch at the cafeteria

Attending editors

Gemma Alderton (Science)
Elizabeth S McKenna (Cancer Discovery)
Ivayla Ivanova (Developmental Cell)

Co-organizers

Julio Aguirre-Ghiso, Albert Einstein College of Medicine, US
Caroline Dive, Cancer Research UK Manchester Institute, UK
Eva González-Suarez, Spanish National Cancer Research Centre – CNIO, Spain
Héctor Peinado, Spanish National Cancer Research Centre – CNIO, Spain
Manuel Valiente, Spanish National Cancer Research Centre – CNIO, Spain

Schedule may change due to unforeseen circumstances.