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COMMENTARY

CRCI²NA inaugural symposium: A meeting on tumor and immune ecosystems

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Abstract

The CRCI²NA inaugural symposium, a meeting on tumor and immune ecosystems, took place in the vibrant and picturesque city of Nantes. The meeting gathered world-renowned experts in cancer biology and immunology. It showcased the most advanced science on mechanisms driving cellular heterogeneity, plasticity, and signaling in normal and cancer cellular ecosystems, which contribute to cancer development, progression, and therapeutic resistance. Recent developments in cancer immunotherapy and anti-tumor strategies were also discussed to collectively assess new therapeutic vulnerabilities to defeat cancer.

MAIN TEXT

March 20–22, 2024, Nantes-Angers Cancer and Immunology Research Center (CRCI²NA), the leading cancer research center in Western France, has organized its inaugural symposium. The meeting took place in the lovely city of Nantes, nestling on the Loire River. A total of 259 scientists from eight nationalities gathered to attend the symposium (Figure 1). The meeting was divided into four scientific sessions: (i) cellular heterogeneity and plasticity in normal tissues and cancers, (ii) signaling in normal and cancer cellular ecosystems, (iii) molecular basis of cancer therapeutic response and failure, and (iv) immunotherapy and novel anti-tumor strategies. Twenty-eight oral presentations and fifty-five posters were presented over the three days of the symposium.

The symposium started with a masterclass from **Robert A. Weinberg (USA)**, which compellingly underscored that while Darwinian, inherited processes are important, they are not sufficient to fully understand tumor evolution. Professor Weinberg also emphasized that: “a convinced person is often one that is loudly wrong, highlighting the distinction between knowledge and belief.” Among non-inherited processes, those allowing cellular plasticity are of particular importance. Epithelial-mesenchymal transition (EMT) programs, enabling cells to acquire an array of distinct phenotypes in a reversible manner were discussed by Robert A Weinberg during the meeting. He highlighted their contribution to tumor initiation, metastasis, and therapeutic resistance, as well as to stratified epithelia regeneration. Additional talks, including those from **Pierre Savagner, Eloise Grasset, and Aurore Dupuy**

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FIGURE 1 CRCI²NA symposium at a glance. Participants in the conference room and lobby as well as at the gala dinner on the Loire River.

(France) illustrated the multifaceted contribution of EMT to development and cancer progression. Many enigmas remain regarding the precise regulators of EMT and the signaling circuitry enabling EMT-induced cell motility and stemness.

Mechanisms regulating cancer cell stemness and cell state transitions in normal tissues and cancers were discussed by distinct scientists including **Jeremy N. Rich (USA)** and Shuheng Lin (France). Cancer cell heterogeneity and plasticity represent a therapeutic challenge that targeted radionuclide therapies may help unlock as shown by **Samantha Terry (England)**.

The pivotal role of epigenetic regulators in cellular plasticity and cell state transitions in breast cancer was presented by **Céline Vallot (France)** and in multiple myeloma by **Felipe Prosper (Spain)**. In a well-balanced manner, several talks also highlighted the importance of inherited driver genetic alterations in cancer evolution, including tumor-initiating events, associated with therapeutic opportunities as presented by **Olivier Delattre** and **Maryne Dupuy (France)** in Ewing sarcomas. **Long Pan (France)** addressed genetic alterations in liver cancer and their importance in the classification of tumors. **Eric Letouzé (France)** discussed recent data on genetic and epigenetic mechanisms associated with tumor evolution and treatment resistance.

Interactions of malignant cells with their cellular environment as a consequence of genetic and epigenetic alterations are key to understanding tumorigenesis and metastasis. Many scientists reported their latest findings on tumor and immune ecosystems. Interactions of cancer cells with endothelial cells and the influence of intravascular forces on metastasis were addressed by


Jacky Goetz (France). **Colin Niaudet (France)** underscored the importance of keeping blood vessels in shape. Interactions of tumor cells with immune cells through the expression of neoantigens or interactions with immunosuppressive macrophages were extensively discussed. **Iliaria Elia (Belgium)** described important metabolic cross-talk between T cells and tumor cells. **Sara Gandolfi (Finland)**, **Karl-Johan Malmberg (Norway)**, and **Satu Mustjoki (Finland)** showed fascinating results about the interactions with an impact on NK cells, raising hopes for improving NK-based therapies with new fundamental knowledge, as highlighted by **Rachel Golub (France)**. New aspects of signaling pathways regulating intrinsic tumor cell properties and cell-cell communication within tumor ecosystems, as well as their responses to therapies, were discussed by **Nadine Laguette (France)**, along with **David Chiron**, **Chiara Ursino**, **Camille Trioën**, **Clément Rivière**, and **Clotilde Renaud (France)**.

Altogether, these high-quality presentations underscored the complexity of tumor ecosystems and the necessity of integrated multimodal approaches to study them, ranging from single-cell genomics, to spatial biology, and novel imaging technologies. The emergence of new therapeutic opportunities, including epidrugs (i.e. drugs targeting epigenetic regulators), metabolic and immune modulators resulting from new findings on tumor and immune ecosystems offer great promises for oncology. It was thus apparent from this symposium that the cancer research field has entered a new era for a better understanding of cancers as pseudo-organs. The latest findings in this field of research are expected to be discussed again at the next CRCI²NA symposium in 2026.

DATA AVAILABILITY STATEMENT


Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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