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LAUREA MAGISTRALE IN BIOLOGIA MOLECOLARE E DELLA SALUTE

SEMINARIO

Giovedì 16 Marzo 2023 - ore 15:30
Aula Vincenzo Mutolo - Dipartimento STEBICEF

Prof. Antonino B. D'Assoro
Associate Professor of Pharmacology
Medical Oncology, Mayo Clinic
Rochester, USA

"Role of Aurora-A Mitotic Kinase in Breast Cancer: From the Bench to the Bedside"

Ospite
Prof. Aldo Di Leonardo

LAUREA MAGISTRALE IN BIOLOGIA MOLECOLARE E DELLA SALUTE

Prof. Antonino B. D'Assoro M.D.; Ph.D.
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Abstract

Early relapse and breast cancer progression are linked to the enrichment of a sub-fraction of cancer cells, termed cancer stem-like cells (CSCs), that undergo epithelial to mesenchymal transition (EMT) and typically exhibit a basal-like $CD44^{high}/CD24^{low}$ and/or $ALDH^{high}$ phenotype with critical cancer stem-like features such as high self-renewal capacity and intrinsic (*de novo*) resistance to standard of care chemo-endocrine therapy. One of the major mechanisms responsible for the intrinsic drug resistance of CSCs is their high ALDH activity leading to the inhibition of chemotherapy-induced apoptosis. Dr. D'Assoro's laboratory has demonstrated for the first time that aberrant activation of Aurora-A Kinase (AURKA) induces EMT and stemness reprogramming that promotes the enrichment of CSCs after treatment with standard-of-care anti-cancer drugs. This mechanism is responsible for early tumor relapse and progression. Significantly, these preclinical studies have led to two innovative clinical trials with the AURKA inhibitor **alisertib** in metastatic ER+ breast cancer patients. Preclinical studies in Dr. D'Assoro's lab showed that the combination of taxanes with dual TGF-β and AURKA pharmacologic targeting impaired tumor relapse and the emergence of organ metastasis in Triple Negative Breast Cancer (TNBC) models. Taken together, these findings reveal the critical role of AURKA oncogenic signaling in mediating TGF-β-induced cancer cell plasticity, chemoresistance, and tumor progression. Moreover, recent studies in Dr. D'Assoro's laboratory have defined the role of key stemness signaling pathways in regulating PD-L1 expression and the immune evasion capacity of cancer cells. These ongoing studies will lead to innovative stemness-targeted clinical trials to enhance the therapeutic efficacy of FDA-approved Immune Checkpoint Inhibitors and improve the clinical outcome of patients.

Biography

Prof. Antonino B. D'Assoro completed his M.D. at the University of Catania (Italy) in 1998 and received his Ph.D. in 2006 from a joint collaboration between the University of Catania and the Mayo Graduate School of Medicine. He has completed his postdoctoral studies in the Department of Biochemistry and Molecular Biology at the Mayo Clinic under the mentorship of Prof. Jeffrey Salisbury. Dr. D'Assoro and his research team are recognized experts in breast cancer stemness biology and early development of clinical trials. Currently, Dr. D'Assoro holds the academic appointment of Associate Professor of Pharmacology in the Department of Medical Oncology at the Mayo Clinic. He is the Program Director of a NIH and Minnesota Partnership funded cancer research laboratory and he is an established study section committee member of NIH and the American Department of Defense for the selection of competitive research grants.
Dr. D'Assoro has published more than 40 papers in reputed journals and has been serving as an editorial board member of repute.