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## The biology of extracellular vesicles in breast cancer progression and therapy resistance

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In recent decades, the study of extracellular vesicles (EVs) biology has gained growing interest, representing an attractive area of cancer research with many potential clinical applications. EVs are nanosized, lipid bilayer-enclosed particles released from all cell types into biological fluids that exert a pleiotropic role in a wide variety of physiological and pathological processes, including carcinogenesis of the breast. Indeed, several reports have demonstrated that EVs by transferring their genetic and molecular cargo in target cells are able to regulate the complex intracellular pathways involved in tumor initiation, progression, metastatic dissemination, and drug resistance in breast cancer. Particularly, the role of EVs has been explored in metastasis and endocrine resistance mechanisms, which represent the leading cause of breast cancer morbidity and mortality. Reports highlight that the plasticity of breast cancer cells, fundamental for the establishment of distant metastasis, may be in part attributed to EV-carried signals shared between adjacent cells in the tumor microenvironment (e.g. adipocytes, macrophages, fibroblasts) as well as with long-distance cells in the body. Two-thirds of breast cancer patients present an estrogen receptor-positive tumor at diagnosis, and the main treatment options for these patients are endocrine therapies such as aromatase inhibitors, selective modulators of estrogen receptor activity or selective estrogen receptor down-regulators. Although hormonal treatments have high efficacy in early-stage breast cancers, the failure of the therapeutic response to these therapies remains a major clinical challenge. Many evidence highlight EV-mediated communication as a newly identified mechanism underlying endocrine resistance in breast cancer. Unraveling the role of EVs during the tumor evolution is still an open question in the cancer research area and the molecular mechanisms involved should be better defined to discover alternative therapeutic approaches to control metastasis outgrowth and overcome resistance in women with breast cancer.

### Biography

Cinzia Giordano has her expertise in the study of the molecular mechanisms governing breast cancer progression and resistance to endocrine therapies. Particularly, her research interest, in the last years, has focused on dissecting the intricate connection between the condition of obesity with the onset and progression of breast cancer, evaluating the specific role of the adipokine leptin and the extracellular vesicles (EVs). In addition, she focused her interest in the study of the Mediterranean Diet and physical activity impact on the circulating biochemical parameters and on the inflammatory state in adolescents, as a strategy for the prevention of chronic non-communicable diseases over the entire lifespan.

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