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## Identification of common pathways and markers in somatic stem cells and cancer stem cells

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Cancer stem cells (CSCs) are considered to be important for tumor development, metastasis, and chemoresistance based on their key ability to survive standard cancer chemotherapies. Multiple studies have now defined CSCs as having an increased tumorigenic ability in serial transplantation experiments conducted in tumor xenografts. This assay, however, may not be entirely accurate in clearly identifying CSCs. Nevertheless, there is enough evidence to support the idea that CSCs are necessary to initiate and propagate tumor diversity. In addition, CSCs are studied in multiple solid tumors, including ovarian cancer, due to their intrinsic chemoresistance properties. Thus, while non-CSCs have been shown to be sensitive to available therapies, CSCs are enriched in response to treatment and regenerate an increasingly platinum resistant tumor. Furthermore, similar to normal stem cells, CSCs are likely shielded from damage and injury by the tumor niche microenvironment, which makes it difficult to target them therapeutically.

The cellular origin of ovarian cancer stem cells has been difficult to identify. Multiple stem cell models have been proposed. One model proposes that CSCs can originate either from somatic adult stem cells or from progenitor non-stem cells. The ovarian surface epithelium and distal fallopian tube, which are tumor initiation sites, consist of both adult stem cells and also progenitor cells that are relatively undifferentiated and capable of differentiating into distinct morphological subtypes. We have recently found that ovarian cancer and somatic stem cells share common molecular pathways and markers, which is consistent with the model that some cancer stem cells may either arise from adult stem cells or most likely evolve to mimic somatic stem cell properties.

### Biography

Dinulescu is an Assistant Professor at Harvard Medical School. She received her Ph.D. from Oregon Health and Science University and completed her postdoctoral studies in the field of Cancer Genetics at MIT. Dr. Dinulescu's research interests focus on cancer biology, malignancies of the gonads and reproductive tract, with a special emphasis on ovarian cancer research and endometriosis. Our laboratory is actively investigating the key contribution of cancer stem cells (CSCs) to tumor chemoresistance. Our current studies focus on better understanding the mechanism of stem cell signaling in the maintenance of the CSC niche and ovarian tumorigenesis. The aim is to harness the power of nanotechnology to develop improved homing technologies for the delivery of therapeutic agents specifically targeting and sensitizing ovarian cancer cells, including CSCs, in a spatio-temporal fashion.

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