

Identification of markers for metastatic, drug resistant breast cancer stem cells.

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Stem cells are essential for maintenance of multiple tissues including the blood, brain and breast. Remarkably, cancers invariably arise in tissues that contain stem cells whose function is to maintain and repair tissues for the life of the animal. Self renewal, the mechanisms by which stem cells regenerate themselves, is the fundamental property by which stem cells maintain themselves. Our laboratory investigates the fundamental molecular mechanisms of self renewal. Our studies have found that stem cells can be identified by the expression of genes required for self renewal AND by the lack of expression of genes that suppress self renewal. The specific components of self renewal pathways in normal and mammary gland stem cells will be discussed. How perturbations of these pathways contribute to drug resistance and metastases will be described.