Stems cells are defined as cells with the ability to self-renew and to differentiate into multiple lineages. This definition applies to both physiologic and pathologic conditions. In the case of cancer, multiple experimental evidences support the existence of specific cell populations that are functionally identified for their capacity to initiate and propagate tumors. These cells have been classically called tumor initiating cells (TICs) or cancer stem cells (CSCs) and are supposed to possess stem cell-like properties, including long-term self-renewal, capacity of multi-lineage differentiation, increased resistance to therapy, and the ability to promote tumor relapse and metastasis. This special issue will focus on understanding the molecular mechanisms that control normal and cancer-related stemness and the tools that are currently available for studying them both in vitro and in vivo. In particular, we will pay attention in how TICs contribute to cancer progression and therapy resistance, and the possibility of specifically targeting TIC in anti-cancer therapies.

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