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POLYCOMB FAMILY: STEM CELLS, CANCER STEM CELLS, AND PROSTATE CANCER

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Polycomb (PcG) family plays an important role in epigenetic regulation of cell phenotypes through control in post-natal life the formation and maintenance of cell identity, the differentiation of somatic stem cells. The constitutive alteration of production of separate PcG family members promotes formation of cancer stem cells (CSCs) and cancers in different organs including prostate cancer (PC) which currently plays a leading role in cancer morbidity and mortality. This review addresses the structure and functional role of PcG family that was effectively investigated on the model of embryonic stem cells, cellular organization of the prostate, cells-of-origin and CSCs in PC. The functional consequence of constitutive alteration of expression of the key family members of PcG family, *Ezh2* and *Bmi1*, in CSCs and cancer of different tissue specificity was addressed. PC screening is currently based on the measurement of serum PSA that does not allow to diagnose the highly aggressive and metastasize forms of PC. PC treatment includes the use of *Ezh2* и *Bmi1* inhibitors. The further characterization of all PcG family members in PC will promote its effective screening, diagnosis and therapy.

Keywords: Polycomb, cancer stem cells, prostate cancer