Gender in personalized anticancer treatment

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Differences between men and women in the development and prognosis of common tumor types, indicate the need for broader sex-specific research to optimize treatment options. Much of the variation in treatment response is associated with differences between tumors and between hosts. Clinical evidences highlighted the relevance of gender between hosts. The gender differences in oncology is became more evident from analysis of the responses to therapy and we observed that in women the side effects are more pronounced than in men. Analysis of data form different clinical trials confirmed the existence of differences in 5-FU toxicity profiles between men and women, and similarly data have reported for the antiangiogenic inhibitor, bevacizumab. The most common differences are germline SNPs, which can affect the efficiency of drug metabolism/excretion, or might have effects at the level of the target, and mutations on target which can affect the drug binding or activity. In some type of cancers some prognostic biomarkers have different expression in man and woman. For example, women are more susceptible to DNA damage than men for SNPs in CYP or GSTM1, EGFR and KRAS activating mutations are more common in women than in men in the lung cancer. Conclusion: Overall, the variability in tumor development is based on a complex interaction between genetic, hormonal, and behavioral factors and consequently, sex should be considered an important variable in research design, both in basic and clinical research as well as pharmacology.