
Experimental models in the study of pathogenesis and the development of treatments for ovarian cancer (systematic review)

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A systematic review of modern methods of experimental study of ovarian cancer using traditional (immunocompetent, genetically engineered and immunodeficient) and non-traditional (that don’t belong to the mammals) animal models, established and primary cultures of human ovarian cancer, including three-dimensional organotypic spheroids (3D-models ex vivo) is presented. The prospects of the considered models for studying the pathogenesis of various molecular-genetic and histological variants of ovarian cancer, as well as for developing methods of personalized treatment, are discussed. The limitations of modern animal models are indicated. The greatest attention is paid to studies on immunodeficient animals using xenografts based on established cultures of human ovarian cancer cells and on tumor tissue obtained directly from the patients (patient derived xenografts, PDX). The questions of various variants of xenograft transplantation with an emphasis on the problems of orthotopic transplantation of human ovarian cancer into immunodeficient mice and the relevance of methods for local humanization in heterotopic transplantation are considered. The most promising, from the point of the author’s view, approaches to studying the effectiveness of drug therapy for ovarian cancer in immunodeficient animal models are outlined. To prepare a systematic review, a literature search was carried out on the Scopus, Web of Science, Med Line, PubMed, Cyber Leninka, RSCI databases. The analysis used literature sources indexed in the Scopus and Web of Science databases (97%) and the RSCI. More than 60% of the works amount has been published over the past 5 years.

Key words: ovarian cancer, 2D and 3D cultures of malignant cells, xenografts of human malignant tumors, immunodeficient animals, genetically engineered animals, orthotopic transplantation of human tumors