

Title: Molecular targeted therapies for cutaneous squamous cell carcinoma: recent developments and clinical implications

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Abstract: Cutaneous Squamous Cell Carcinoma (cSCC) is a common and potentially fatal type of skin cancer that poses a significant threat to public health and has a high prevalence rate. Exposure to ultraviolet radiation on the skin surface increases the risk of cSCC, especially in those with genetic syndromes like xerodermapigmentosum and epidermolysis bullosa. Therefore, understanding the molecular pathogenesis of cSCC is critical for developing personalized treatment approaches that are effective in cSCC. This article provides a comprehensive overview of current knowledge of cSCC pathogenesis, emphasizing dysregulated signaling pathways and the significance of molecular profiling. Several limitations and challenges associated with conventional therapies, however, are identified, stressing the need for novel therapeutic strategies. The article further discusses molecular targets and therapeutic approaches, i.e., epidermal growth factor receptor inhibitors, hedgehog pathway inhibitors, and PI3K/AKT/mTOR pathway inhibitors, as well as emerging molecular targets and therapeutic agents. The manuscript explores resistance mechanisms to molecularly targeted therapies and proposes methods to overcome them, including combination strategies, rational design, and optimization. The clinical implications and patient outcomes of molecular-targeted treatments are assessed, including response rates and survival outcomes. The management of adverse events and toxicities in molecular-targeted therapies is crucial and requires careful monitoring and control. The paper further discusses future directions for therapeutic advancement and research in this area, as well as the difficulties and constraints associated with conventional therapies.

Keywords: Skin cancer, Clinical trials, Combination strategies, Clinical implications, Patient monitoring.

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