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Molecular Pharmacology: Search for New Target-Drug in Neoplasia's

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Abstract

Neoplastic diseases are the second cause of death and according to annual statistics. Malignant brain tumors and head and neck cancer, including mouth cancer are the most common, and although they have a low incidence, have a high mortality rate. Currently, 90% of chemotherapy failures occur during invasion and metastasis of tumors related to drug resistance. Administration of a given drug, even in therapeutic amounts, leads to many tumor cells from patients becoming resistant to the drug. Thus, drug resistance appears as a serious problem in the field of cancer, since there are several mechanisms of avoidance.

Keywords: Molecular Pharmacology; Targeted Drugs; Glioblastoma

Introduction

Recent findings point to the important role of the tumor micro environment in the discussion of drug resistance as the main reason for the relapse and incurability of various types of cancer. The tumor micro environment involves cancer stem cells (CSC), an extracellular matrix (ECM), and various soluble factors that include cytokines and growth factors. The communication of tumor-tumor cells, tumor-cell-stroma communication, as well as the tumor-ECM interface, contributes to direct cellular interaction mediated by drug resistance [1].

Searching New Target of Drugs

Cancer stem cells share several normal stem cells that provide a long lifespan, including silencing, resistance to drugs and toxins through the expression of drug efflux transporters, active DNA repair ability and resistance to apoptosis, niche-vascular numbness, stability to hypoxia and increased activity of repair enzymes. Cells expressing highly multi drug resistance protein 1 (MRP1) confer resistance to a variety of anticancer drugs from natural products, including vinca alkaloids, anthracyclines and epipodophyllotoxins [2].

The transcription factor group-box of high mobility determinant region of the sex Y-box 2 (SOX2) is essential for the maintenance of stem cells from the initial development until adult tissues. SOX2 can reprogram differentiated cells into pluripotent cells in conjunction with other factors and is overexpressed in various types of cancer. In GBM, SOX2 is a marker of CSCs in both primary and neurosphere cultures and is associated with coexpression with various lineage markers, suggesting that its expression extends beyond CSCs, encompassing neoplastic cells with more differentiated molecular subtypes. Finally, Vimentin, a multifunctional intermediate filament that interacts with several other proteins and participates in several cellular functions. Overexpression of vimentin has been reported in several tumor cell lines, including central nervous system tumor, prostate cancer, malignant melanoma, and lung cancer cell lines. Overexpression of vimentin has also been associated with increased cancer cell growth, invasion and migration, suggesting that vimentin participates in the promotion of these tumorigenic events and would serve as a target for cancer therapy [3].

The MBBL Project

Our present work, developing in the Molecular Biomedicine of the Brain Laboratory (MBBL) seeks to associate the study of the expression of tumor markers of resistance to chemotherapeutic treatment – SOX2, MRP1 and Vimentin. Using the combination of drugs used in several types of tumors and identifying markers that causes chemotherapy resistance that leads to relapses and refractories tumors which lead to a poor prognosis and decrease survival and quality of life, thus seeking to establish possible alternatives both diagnostic and targets for the development of new drugs.

Conflict of Interest

The author declares no conflict of interest.

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