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Carcinoma Immunotoxin Targeting Epidermal Growth Factor and Interleukin-4 Receptors

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Treating Drug Resistant Carcinomas with Immunotoxins

Thousands of cancer patients each year develop drug refractory cancer. Refactory cancer cells are malignant cancer cells that are resistant to chemotherapy treatments. Sometimes therapies include immunotoxins which kill carcinoma cells by a mechanism entirely unrelated to conventional chemotherapeutic agents and kill drug resistant cells. These immunotoxins are important as alternative or supplemental therapies to conventional chemotherapy treatments. One of the major challenges with immunotoxins is targeting the right carcinoma cells. Immunotoxins can be tuned to recognize different cytokine receptors on cancer cell surfaces. Cytokines are small proteins released by the immune system that are very important in cell signaling. Different types of carcinomas present different cytokine receptors on their cell surface and targeting the right ones can direct an immuntoxin towards breast, colon, lung, prostate, and brain cancer tumors.

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Immunotoxin for Targeting Specific Carcinomas with Epidermal Growth Factor and Interleukin-4 Receptors

Two major cytokine receptors present in several types of carcinomas are Epidermal Growth Factor (EGF) and Interleukin-4 (IL-4). An immunotoxin, EGF4KDEL, with both EGF and Interleukin-4 present on the same truncated diphtheria toxin chain has sufficiently greater carcinoma killing activity than immunotoxins that target either EGF or IL-4 separately. This has been shown to be effective on prostate, colon, lung, pancreatic, and breast cancer cells. Aside from this broad spectrum of carcinomas, EGF4KDEL has also shown an enhanced ability to kill glioblastomas in brain cancer. Glioblastoma is a form of brain cancer in which the effected cells are the glial cells that provide protection and support for the brain's neurons. The unique characteristic of EGF4KDEL to target glioblastoma cells is favorable because glioblastomas are characteristically

unrelated to other types of carcinomas.

BENEFITS OF TARGETING DRUG RESISTANT CARCINOMA CELLS WITH IMMUNOTOXINS:

- Immunotoxins have the ability to kill drug resistant carcinomas by an alternative mechanism
- Immunotoxins take advantage of cytokine receptors present on the carcinoma cell surface
- Higher specificity of immunotoxins can be achieved by targeting multiple receptors
- Immunotoxins can target gioblastoma cells which respond differently to conventional chemotherapy techniques

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