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Editorial

Targeting of Radiation Inducible Tumor Antigen for Cancer Treatment

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Development of anti-cancer targeted therapy remains of the biggest challenges in the effective cancer treatment. In addition to surgery and chemotherapy, ionizing radiation (IR) is one of the most commonly employed treatment method for many types of human cancer. IR can achieve cell killing through DNA breaks and has been shown to elicit phenotype changes in tumor cells in responses of IR stress, resulting in intracellular molecules being expressed on the surface of tumor cells. These molecules called neo-antigens or IR inducible antigens. This neo-antigen molecule can be exploited as target for human cancer treatment. Antibodies included monoclonal antibody and Single chain fragment variable (ScFv) antibodies are the tools to target these neo-antigens. The antibodies can be created by hybridoma technology through the cell fusion or selected through phage or yeast display human ScFv antibody library. The tumor cells can be killed by antibody activation of immune responses mediated by ADCP (antibody-dependent cell mediated phagocytosis); ADCC (antibody-dependent cell-mediated cytotoxicity) with the receptors on dendritic cells, NK cells or other kinds of cytotoxicity T cells, or via the complement activation to form MAC (membrane attack complex) to kill tumor cells. Antibodies can also specifically deliver radioactive materials and slip powerful drugs into tumor cells or deliver an exotoxin to kill tumor cells. Also, the antibody can also be humanization. This is important for reducing the immunogenicity of monoclonal antibodies derived from xenogeneic sources (commonly rodent) and for improving their activation of the human immune system with original CDRs binding specificity and affinity. The humanized antibody to be used for human tumor treatment as bench to bed translation application to fight human cancers.

He has over 20 years of experience in producing these kinds of antibodies and studied on kinds of molecules including these IR inducible neo-antigens on surface of tumor cells and experienced in immuno-detections, studying on human tumor mouse xenograft models in vitro and in vivo imaging. He co-authored a published monograph book and successfully made these antibodies against such IR inducible antigen for research and pre-clinical trial application.