Dr. Epstein’s laboratory has been involved in treatment and diagnosis of lymphomas and solid tumors using antibody-based technologies.

Methods to improve the uptake of antibodies and drugs in tumors and target therapeutic reagents for the imaging and therapy of cancer have been developed. Specifically, antibodies directed against lymphomas (LN panel, Lym-1, Lym-2) and carcinomas (tumor necrosis treatment antibodies) have been used both in murine animal models and man and been shown to target cancer specifically. More recently, genetically engineered chLym-1 and chTNT-3 fusion proteins consisting of cytokines, chemokines, and co-stimulatory molecules have been developed to alter the tumor microenvironment for the immunotherapy of cancer.

In addition, studies are underway to reveal the immune profile of tumors at the time of diagnosis to determine what mechanisms are used to produce immune tolerance. Murine tumor models are being used to test these newly developed fusion proteins for their ability to treat early and late tumors in order to identity potential reagents for clinical translation.

At the present time, Dr. Epstein is investigating the role of human suppressor cell populations such as T-regulatory cells (Treg) and myeloid derived suppressor cells (MDSC) on tumor growth and immune escape. Antibodies directed against these cells are being generated and conjugated to co-stimulatory molecules or siRNA reagents capable of silencing key genes associated with suppressor cell function. The major direction of the laboratory is to develop novel methods of treating suppressor cells to enable tumor and dendritic cell vaccines to provide an effective and lasting immune response to tumors. As in vivo models, several syngeneic murine tumor models are being used to test the effectiveness of these approaches before specific reagents are translated to man.