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**NIH Office of Biotechnology Activities' Recombinant DNA Advisory Committee**  
**Application for Fred Hutchinson Cancer Research Center Protocol 2154,**  
***A Pilot Study To Evaluate the Safety and Feasibility of Cellular Immunotherapy Using***  
***Genetically Modified Autologous CD20-Specific T cells for Patients with Relapsed or***  
***Refractory Mantle Cell and Indolent B Cell Lymphomas***

**Non-Technical Abstract**

Indolent non-Hodgkin's lymphoma and mantle cell lymphoma are types of cancer that develop in lymph nodes. There is no treatment that cures these lymphomas, except possibly bone marrow transplantation. This research study is attempting to develop a new treatment using the patient's own immune system. Twelve patients with indolent or mantle cell lymphoma that returns after standard chemotherapy will participate in this study. Patients will have immune cells (T lymphocytes) collected from their blood using a special machine. These cells will be modified in a laboratory by inserting an artificial gene that lets them recognize a molecule called CD20 that is found on lymphoma cells. The modified T cells will be grown to large numbers over 2-3 months. When the T cells are ready, patients will receive a chemotherapy drug called fludarabine to help kill the lymphoma and prepare the body to nurture the T cells. The modified T cells will be injected into the patient's bloodstream in three separate infusions, 2-5 days apart, with higher numbers of T cells each time. The T cells should bind to lymphoma cells and kill them. Some normal B-lymphocytes will also be killed, but these should reappear a few weeks or months later. Patients will also receive a medicine called "interleukin 2" injected twice daily for two weeks, to help the T cells live longer inside the body. Patients will have follow-up blood tests, CT scans and other studies to see how long the T cells survive and if they kill lymphoma cells.