



Cytochrome P450 1B1 is a Universal Tumor Antigen Eliciting Cytotoxic T Cell Responses

Case Number: 641

Investigator: L. Nadler

Categories: Therapeutics

Technology Description

Cytochrome P450 1B1 (CYP1B1) is an extrahepatic, drug-metabolizing enzyme. Recent advances at the Dana-Farber Cancer Institute have demonstrated that CYP1B1 is overexpressed in all primary human tumors and minimally expressed in normal critical tissues. This invention provides methods both for immunotherapeutic targeting of CYP1B1-expressing cells and for monitoring the progress of this approach. This technology can be used either as a treatment for pre-existing cancers (including bladder, brain, colon, lung and kidney), or as a prophylactic measure to prevent conditions from arising or recurring in at-risk patients. In either instance, the immunotherapy relies first upon antigen presenting cells that take up and process the CYP1B1 protein or peptide antigen; a series of subsequent events leads to activation of cytotoxic T lymphocytes (CTLs), which proliferate and kill target cells that express the antigen. The progress of the therapy may be monitored by contrasting CYP1B1-specific CTL levels relative to those obtained from the pre-vaccinated (or pre-stimulated, in the case of ex vivo methodologies) state.

Applications/Advantages

Cancer therapeutics generally do not differentiate between cancer and normal cells, resulting in considerable toxicity. Since CYP1B1 expression is limited in normal tissue, and highly expressed in human cancers, immunotherapy directed against CYP1B1-expressing cells is far more specific. Furthermore, unlike several epitopes in other tumor-associated antigens, CYP1B1 contains epitopes characterized by high binding affinity for the major histocompatibility complex (MHC); MHC binding and MHC-peptide complex stability are important parameters influencing MHC-peptide immunogenicity.

Patent Status

- Foreign patent applications pending
- U.S. patent application pending

License Status

- Available for non-exclusive licensing

Contact

Ruth Emyanitoff, PhD
Senior Licensing Manager

Phone: (617) 632-4010
Fax: (617) 632-4012
Email: ruth_emyanitoff@dfci.harvard.edu

