Enhancement of Peptide Antigenicity for T Cell Priming Using Albumin Binding Peptides
Technology #19388

Applications

This technology can be used to enhance the lymph node targeting of immunomodulatory molecules for the treatment of cancer and infectious diseases.

Problem Addressed

T-cell mediated immune responses have enormous therapeutic potential in treating cancer and other diseases. T-cells can mount immune responses against tumor-specific or infection-specific antigenic molecules, resulting in targeted therapies against cancer or infection. One of the limiting factors in inducing T-cell responses is delivering immunomodulatory molecules to the lymph nodes, where T-cell responses are primed. Current technologies aimed at lymph node targeting include the use of diacyl lipids linked to peptide antigens with a PEG spacer. However, manufacturing these diacyl lipid compounds with GMP practices for therapeutic use can be challenging. Therefore, there exists a need for novel compounds to deliver immunomodulatory antigens to the lymph nodes.

Technology

This inventors describe a vaccine that is comprised of an albumin binding peptide joined to an immunomodulatory agent, with or without a PEG or Gly-Ser linking motif. The albumin binding peptide is a cyclized amino acid peptide, which binds to serum albumin in the blood stream and allows the vaccine to “hitchhike” a ride to the lymph nodes where it is then processed and presented by antigen presenting cells. This albumin binding peptide can therefore be used to carry the bound immunomodulator, i.e. a peptide antigen or molecular adjuvant, directly to effector antigen presenting cells to prime antigen-specific T cell responses. The inventors demonstrate that addition of the albumin binding peptide increases the cytotoxic CD8+ T-cell response against a melanoma antigen 4 to 6 fold when compared to an antigen-only control in an in vivo mouse model. This technology is an alternative to the current diacyl lipid-directed lymph node targeting constructs and may allow for improved manufacturing or scalability, and additionally, the affinity for albumin can be modified by changes of the albumin binding peptide sequence.

Advantages

- Lymph node targeting of immunomodulatory molecules
- Enhanced CD8+ T-cell responses against antigens
- Control of albumin binding affinity

Categories For This Invention:
Life Sciences
Biotechnology
Clinical Applications
Immunology
Oncology
Therapeutics
Drug Delivery
Peptide
Protein

Intellectual Property:
Albumin binding peptide conjugates and methods thereof
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