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Creation of Multivalent Aptamers to Target Effector T Cells to Attack Tumor Cells

Despite decades of research effort, cancer remains one of today's most pressing health concerns. Present day treatment methods tend to include debilitating side effects mainly due to low specificity of the treatments.

Recently, some attempts have been made to augment tumor immunity by using bi-specific, hybrid antibodies that direct immune cells to the tumor cell, thus increasing the specificity of the treatment and consequently decreasing side effects. The creation of such hybrid antibodies however, is predicated on several requirements including: the availability of existing antibodies that recognize tumor cells, antibodies that recognize T cells, the knowledge of a wide variety of tumor antigens representative of different types of cancer, and the ability to produce stable engineered molecules on a large scale. These formidable requirements leave an opening for a better designed technology that provides rapid, robust, and inexpensive approach for augmenting tumor immunity by promoting cell-cell interaction.

Scientists at Arizona State University's Biodesign Institute have envisioned a novel solution to the problem of bringing together tumor cells and activated T-cells. They have developed a bi-specific aptamer designed to function as diagrammatically shown below.

Potential Applications

- Cancer therapy

Benefits and Advantages

- Boost host's immunity for cancer cells
- Molecules are designed to bring two types of cells in close enough proximity to induce T cell mediated cytotoxicity towards the tumor cell
- The nature of aptamers assures simplified and economical manufacturing in addition to optimal stability

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