

**TITLE OF INVENTION: CHIMERIC ANTIGEN RECEPTORS THAT
BIND TO SSEA4 AND USES THEREOF**

An isolated nucleic acid that contains a nucleotide sequence that encodes the polypeptide of SEQ ID NO: 3. The polypeptide of SEQ ID NO: 3 specifically binds to stage-specific embryonic antigen 4 (SSEA4). Also disclosed is a recombinant cell comprising the isolated nucleic acid described above, a viral vector containing the above isolated nucleic acid, and an isolated polypeptide including the sequence of SEQ ID NO: 3. Provided as well is a chimeric antigen receptor (CAR) that includes a single chain Fv having the sequence of SEQ ID NO: 3 and specifically binding to SSEA4. Moreover, a method is disclosed for treating a tumor by transducing *in vitro* the T cells of a subject having a tumor expressing SSEA4 with a vector that encodes the CAR, expanding the transduced T cells, and infusing the expanded transduced T cells into the subject, whereby an anti-tumor T cell response is raised.

Fig. 1