This week in techniques

Approach	Summary	Licensing status	Publication and contact information
Drug platforms			
Antigen-specific inhibitory chimeric antigen receptors (iCARs) as a self-regulating safety switch to constrain T cell-based therapies	<p>Antigen-specific iCARs could be used as a self-regulating safety switch to constrain T cell-based therapies and avoid off-tumor toxicity. As proof of concept, T cells were modified to include a tumor cell-specific, CD19-specific CAR and a prostate-specific membrane antigen (PSMA; FOLH1; GCP11)-specific iCAR, which contained inhibitory receptor signaling domains based on protectin D1 (PD1) or CTLA-4 (CD152). In cell culture and in a mouse xenograft model, T cells expressing a CD19-specific CAR and a PSMA-specific iCAR killed CD19⁺/PSMA⁻ cells but not CD19⁺/PSMA⁺ cells, preventing off-target effects on PSMA⁺ cells. In culture, the engineered T cells were suppressed when encountering CD19⁺/PSMA⁺ cells and activated when next encountering CD19⁺/PSMA⁻ cells, indicating that iCAR suppression was temporary. Next steps include designing CAR-based or T cell receptor (TCR)-based T cells that express antigen-specific iCARs that target antigens downregulated on cells in solid tumors but present on healthy cells.</p> <p><i>SciBX</i> 7(2); doi:10.1038/scibx.2014.69 Published online Jan. 16, 2014</p>	Patent application filed on the use of iCARs to protect normal tissues from off-target effects of allogeneic or autologous T cells; optioned to Juno Therapeutics Inc.	<p>Fedorov, V.D. <i>et al. Sci. Transl. Med.</i>; published online Dec. 11, 2013; doi:10.1126/scitranslmed.3006597</p> <p>Contact: Michel Sadelain, Memorial Sloan-Kettering Cancer Center, New York, N.Y. e-mail: m-sadelain@ski.mskcc.org</p>