PP-14

Development of an Universal Anti-Polyethylene Glycol Reporter Gene for Noninvasive Imaging of PEGylated Probes

Kuo-Hsiang Chuang (莊國祥)[1], Yu-Ling Lu (呂玉玲)[2], Steve Roffler (羅傅倫)[3], and Tian-Lu Cheng (鄭添祿)[1]

[1] *Kaohsiung Medical University Joint Research Center, Kaohsiung, Taiwan*
[2] *Chia Nan University of Pharmacy and Science, Tainan, Taiwan*
[3] *Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan*

Development of a highly specific and non-immunogenic reporter to monitor gene expression *in vivo* is critical for successful optimization of gene and cell therapy protocols. Here we developed a membrane-anchored anti-polyethylene glycol (αPEG) reporter that can specifically bind PEGylated imaging probes to assess the location, extent and persistence of gene expression or transplanted cells *in vivo*. Functional αPEG reporters that were stably expressed on cells *in vitro* and *in vivo* selectively accumulated various PEGylated imaging probes and could be detected by optical imaging, magnetic resonance (MR) imaging and micro-positron emission tomography (micro-PET). The αPEG reporter displayed an imaging specificity comparable to HSV-tk but did not provoke immune responses or cause toxicity to the host. Importantly, a humanized αPEG reporter retained high imaging specificity in subcutaneous and metastatic tumor models *in vivo*. Thus, the highly specific and non-immunogenic αPEG reporter may be paired with PEGylated probes to provide a valuable system to image gene expression or cell delivery in the clinic.