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## Using anti-poly(ethylene glycol) bioparticles for the quantitation of PEGylated nanoparticles

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Attachment of polyethylene glycol (PEG) molecules to nanoparticles (PEGylation) is a widely-used method to improve the stability, biocompatibility and half-life of nanomedicines. However, the evaluation of the PEGylated nanomedicine pharmacokinetics (PK) requires the decomposition of particles and purification of lead compounds before analysis by high performance liquid chromatography (HPLC), mass spectrometry, etc. Therefore, a method to directly quantify un-decomposed PEGylated nanoparticles is needed. In this study, we developed anti-PEG bioparticles and combined them with anti-PEG antibodies to generate a quantitative enzyme-linked immunosorbent assay (ELISA) for direct measurement of PEGylated nanoparticles without compound purification. The anti-PEG bioparticles quantitative ELISA directly quantify PEG-quantum dots (PEG-QD), PEG-stabilizing super-paramagnetic iron oxide (PEG-SPIO), Lipo-Dox and PEGASYS and the detection limits were 0.01 nM, 0.1 nM, 15.63 ng/mL and 0.48 ng/mL, respectively. Furthermore, this anti-PEG bioparticle-based ELISA tolerated samples containing up to 10% mouse or human serum. There was no significant difference in pharmacokinetic studies of radiolabeled PEG-nanoparticles (Nano-X-<sup>111</sup>In) through anti-PEG bioparticle-based ELISA and a traditional gamma counter. These results suggest that the anti-PEG bioparticle-based ELISA may provide a direct and effective method for the quantitation of any whole PEGylated nanoparticles without sample preparation.

### Biography

Yuan-Chin Hsieh has expertise in Antibody Engineering. Currently, he is working at Boban Health Xieyuan Qin Medical Institute, Taiwan.

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