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Synthetic bacteriophages as nanoparticles for intravenous administration of targeted gene therapy for cancer

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We present a first in human case of a 50 year-old patient with end-stage metastatic ovarian cancer infused with a novel, intravenously administered, synthetically engineered bacteriophage-based gene therapy (Metavec) for metastatic solid malignancies. Compared to mammalian virus-based delivery vehicles, bacteriophage-based vectors bring many preferable features for treatment in humans. Their genomes have been extensively sequenced and, with modern technologies, they are relatively malleable allowing them to be extensively modified. Unlike mammalian viruses, bacteriophages are not natural pathogens to humans yet their capsid can have equivocal cargo carrying capacity. To the authors' best knowledge, no other bacteriophage-based applications have succeeded with intravenous administration. This advance in nanotechnology and novel approach could revolutionize medical care. The patient we discuss received a dose-escalating regime up to 1x1011 particles per dose, three times a week for three weeks. The infusions were very well tolerated. Symptoms include nausea, low-grade fever, and also discomfort in areas where larger tumors were present. Post-infusion investigations included serum biochemistry, serum tumor markers, and computed tomography. The paradigm shift, results, and discussion will be presented.

Biography

Keith Potent is currently a PhD candidate in Translational Research at Monash University. After completing undergraduate degrees in Mathematics and Chemistry, Dr Potent has completed his medical degree. He is a practicing doctor in Queensland.

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