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Farzin Farzaneh

King's College London, UK

Development of therapeutic vaccines against cancer associated antigens

Autologous chimeric antigen receptor (CAR) T cells, one of the most effective of the new immune therapy strategies, are extremely expensive, as they are made for each patient individually. Deletion of the endogenous T cell receptor allows the use of allogeneic CAR T cells, which if proven to be safe and effective, will be substantially cheaper and suitable for large populations of patients. We have helped with the development of allogeneic CAR T cells, now in a number of phase-I clinical trials, providing preliminary evidence of safety and efficacy. In an entirely different form of immune gene therapy, we have shown that myeloid leukaemia cells expressing immune co-stimulatory molecules and appropriate cytokines can induce the rejection of previously established cancers in several mouse models. In two phase-I clinical trials, in poor prognosis acute myeloid leukaemia (AML) patients, we are now assessing the safety and potential efficacy of autologous CD80/IL-2 expressing AML cells. Preliminary data shows evidence of vaccination induced antigen specific cellular immunity and clinical efficacy. In order to develop therapeutic cancer vaccinations, we have identified combinations of adjuvants for synergistic activation of cytotoxicity (CASAC) that can induce antigen-specific cellular immunity, even in immune senescent aged mice. Using a simpler version of CASAC in combination with a selected library of hTERT peptides, we are completing a phase-I trial in patients with therapy resistant, progressive, metastatic disease. Early results indicate safety and stimulation of immunological responses, as well as objective clinical responses and disease stasis in up to 40% of patients.

Biography

Farzin Farzaneh holds the Chair of Molecular Medicine at King's College London. He has published over 250 research articles with an average citation of over 30, and an impact factor of 47. He has run a licensed GMP facility at King's College London, since 2001, for the production of cell and gene therapy based investigational medicinal products. He has extensive industrial and academic collaborations, including research council, charitable and pharmaceutical sponsorships of £25 M. He has initiated a number of clinical trials in novel applications of gene therapy and holds MHRA licences (IMPs and "Specials"). He is a Qualified Person (QP) for release of cell and gene therapy products in UK and EU and an Individual Designate under a Human Tissue Authority licence that allows procurement, testing, processing, distribution and/or import/export of tissues and/or cells intended for human applications. He is also appointed by the Commission on Human Medicines, as a member of the Clinical Trials, Biologicals & Vaccines Expert Advisory Group since 2016.

Farzin.Farzaneh@kcl.ac.uk

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