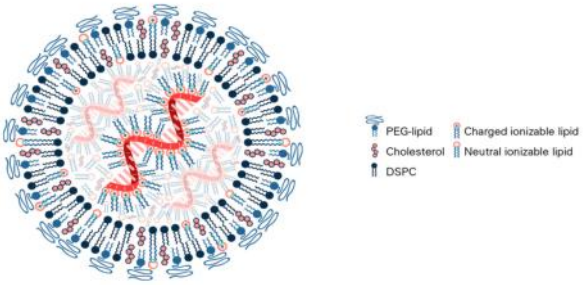
PROJECT NUMBER

24278

Universal HLA-E mRNA vaccine platform

This technology utilises mRNA-encoded HLA-E–β2 microglobulin–peptide single-chain trimers to directly present target antigens on cell surfaces. It enables robust, HLA restricted T cell activation without reliance on conventional antigen processing pathways.

Applications: Therapeutic cancer vaccines, prophylactic and therapeutic viral vaccines



Features	Benefits
Universal vaccine applicability	By targeting HLA-E, a non-polymorphic molecule, this platform enables consistent immune responses across all patients - eliminating the need for HLA-matched vaccine design
Direct antigen presentation for enhanced immunogenicity	The single-chain trimer design bypasses inefficient antigen processing pathways, ensuring stable and highlevel presentation of target peptides to T cells, improving immune activation

Features	Benefits
Overcomes limitations of conventional vaccines	Traditional protein or mRNA vaccines rely on intracellular antigen processing, which is inefficient for HLA-E due to low peptide binding affinity. This approach directly solves that bottleneck
mRNA and lipid nanoparticle compatibility	Built on clinically validated mRNA-LNP delivery systems, the platform supports rapid development, scalable manufacturing, and flexible antigen design - aligned with current vaccine infrastructure
Tuneable and optimisable design	The platform allows engineering of peptide sequences and HLA-E constructs (e.g. mutations to enhance stability or surface expression), enabling optimisation for potency and durability

Available for

- Co-development
- Consulting
- Licensing

To find out more, contact enquiries@innovation.ox.ac.uk and quote the project number.

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