

**演題：Next-Generation RNA-Encoded Medicine: Transforming the cost and quality of in vivo Expression of CAR-T, BiTEs, and Individualised Cancer Vaccines.**

**演者：Parker Moss 博士**

**Wellcome Leap (Program Director, R3 Global)**

**日時：2026年3月27日(金) 11:00~12:00**

**場所：京都大学医生物学研究所 2号館  
1階セミナー室 (104号室)**

**講演要旨(Abstract)：**

Wellcome Leap, a charity owned by the Wellcome Trust, utilizes the DARPA-style innovation model to accelerate health breakthroughs. Its R3 Global program establishes a distributed network of RNA biofoundries to bypass the bottlenecks of traditional biologic fabrication. For academics, this shifts production from capital-intensive ex vivo systems to a synthetic mRNA-driven in vivo paradigm.

The program integrates advanced codon optimization, maximizing translational kinetics and proteomic fidelity, and ensuring host cells achieve optimal therapeutic protein stoichiometry. A further cornerstone of this initiative is microfluidic flow chemistry for delivering DNA template amplification, in vitro transcription, purification, and formulation into LNPs, polymers, or dendrimers. Unlike batch-mixing, this continuous-flow process in a small-footprint device enables isovolumetric scale-up from small pre-clinical to commercial CMC volumes without reformulation or revalidation. This eliminates years of technology transfer between bioreactors. The translational benefits are transformative: in infectious disease, it enables high-velocity vaccine production to beat the CEPI 100-day challenge; in oncology, it shatters the cost structures of in vivo CAR-T, BiTEs, and individualised cancer vaccines.

Parker Moss will discuss how this technological architecture allows clinical academics to translate complex protein therapeutics at a radically decoupled cost-to-scale ratio.