

New Zealand RNA Platform
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RNA is gaining wide interest as a therapeutic tool for the treatment of diseases, such as infectious diseases, metabolic and genetic disorders, autoimmune disorders, and cancer. Messenger RNA (mRNA) vaccines have shown recent success due to advances in RNA production, bioinformatics, and development of the ionizable lipid nanoparticle (iLNP). mRNA vaccines offer increased adaptability over other vaccine types, by changing the antigen encoded by the RNA sequence without big changes to the production process. With this adaptability, RNA could be used for rapid vaccine development for evolving pathogens or for personalized treatments. Yet further research into mRNA vaccine technology is needed to overcome limitations such as iLNP vaccine stability, antigen longevity, and the costs of essential components.

New Zealand's RNA platform is building a standardized mRNA vaccine production pipeline, with quality control procedures, to further the development of novel antigens and methodology. This involves the production DNA template using widely available enzymes, RNA synthesis by in vitro transcription, and formulation into an iLNP using a microfluidic mixer. Several quality control assessments are used to ensure success at each step of production. This standardized pipeline will enable the production of high-quality RNA encapsulated in iLNPs of a consistent size with high RNA encapsulation efficiencies (>90%). With this, New Zealand's RNA platform aims to develop mRNA vaccines against novel targets and aid research into developing RNA therapeutics for the treatment of rare and infectious diseases. The poster presentation will include updates on the current focus points of NZ's RNA platform including some of the projects we have are working on.