NSW RNA Production and Research Network

ACTIVITIES

PRODUCTION, SERVICES & SUPPORT

- Production of high-quality siRNA, mRNA and lipid nanoparticles for therapeutic delivery
- Genomics, proteomics, high-throughput screening, SARS-CoV-2 PC3 lab, animal testing, training for GLP/GMP

PILOT PROJECT 1

siRNA loaded lipid nanoparticles to treat SARS-CoV-2

siRNA synthesis → siRNA loaded NP → *in vitro/in vivo* efficacy study

PILOT PROJECT 2

RNA nanoparticle delivery systems for respiratory tract

Lipid synthesis → Optimise RNA encapsulation → siRNA, mRNA loaded NP → *in vitro/in vivo* efficacy study

PILOT PROJECT 3

Hybrid mRNA-viral vector delivery to treat liver disease

Nucleotide synthesis → mRNA production → mRNA loaded NP → *in vitro/in vivo* efficacy study

DNA plasmid production → mRNA production

FUTURE PROJECTS

New tranformative RNA therapeutic projects *via* competitive selection process

OUTCOMES

Analytical methods to support production and optimisation of RNA/lipid NP:
- Synthesis
- Production
- Formulation
- Delivery

- siRNA/NP system that reduces or eliminates SARS-CoV-2 infection
- Production process ready for human clinical trials and GMP manufacturing

- Pilot-scale RNA/nanoparticle lung delivery system for *in vivo* pre-clinical studies
- Production process ready for human clinical trials and GMP manufacturing

- Combined mRNA/NP/AAV *in vivo* study for treatment of liver disease
- Production process ready for human clinical trials and GMP manufacturing

Optimised processes for GLP and GMP production of:
- mRNA, siRNA
- Lipids and nucleotides
- Lipid NP/RNA formulations

IMPACT

Build local expertise in RNA, mRNA and siRNA:
- Research
- Scale-up
- Analysis
- Process development
- GLP/GMP production
- Pre-clinical studies

Enable local GLP process development and production of RNA/lipid nanoparticle therapeutics

Enable local GLP process development and production of RNA/lipid nanoparticle therapeutics

Support local GMP production of RNA/lipid nanoparticle therapeutics

Expedited translation of research to clinical outcomes

» Creation of NSW-based RNA medical research and manufacturing industry

» Position NSW as a hub for development and production of RNA therapeutics