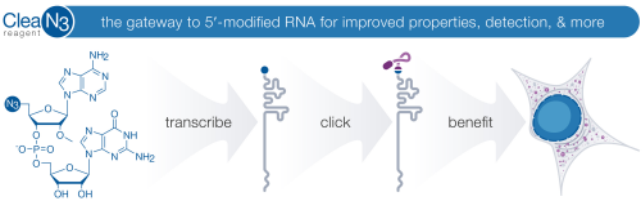
PROJECT NUMBER

22811

Enhancement of RNA properties via in vitro transcription priming

A new molecular tool utilising in vitro transcription priming to modify RNA, enhancing its stability and translation, and allowing its detection.

Applications: Cap-independently translated mRNA, Therapeutic vaccines, Gene therapies, Cancer immunotherapies, Regulatory control of protein expression, mRNA screening, mRNA detection, mRNA delivery



Features	Benefits
Use of an azido-functionalised dinucleotide in vitro transcription primer, CleaN3, that relies on base-pairing with T7 RNA polymerase promoters leads to high priming efficiencies and in vitro transcription yields	Superior in vitro transcription yields, priming efficiencies, and primed transcript homogeneities over existing primers for cap-independently translated mRNAs, and non-coding RNAs
The 5′ azide present in CleaN3-primed transcripts, provides access to post-transcriptional modification via click chemistry, e.g., strain-promoted azide-alkyne cycloaddition (SPAAC)	A rapid and efficient process over existing synthesis processes – one working day to synthesis 5’ modified transcripts from nucleoside triphosphates; Click chemistry permits improvements to properties of cap-independently translated mRNAs

Features	Benefits
Enhanced linear cap-independently translated (CIT) mRNA properties, such as translation efficiency and stability without eliciting immunogenicity	Enables production of therapeutic mRNA designs to target diseases, such as cancers; Spatiotemporal characterisation of CIT mRNA uptake and cellular fate
	Convenient benchmarking of internal ribosome entry sites (IRESs) and cap-independent translational enhancers (CITEs) independent of cell line-specific factors, which is currently challenging

Awaiting patent and Available for

- Co-development
- Consulting
- Licensing

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