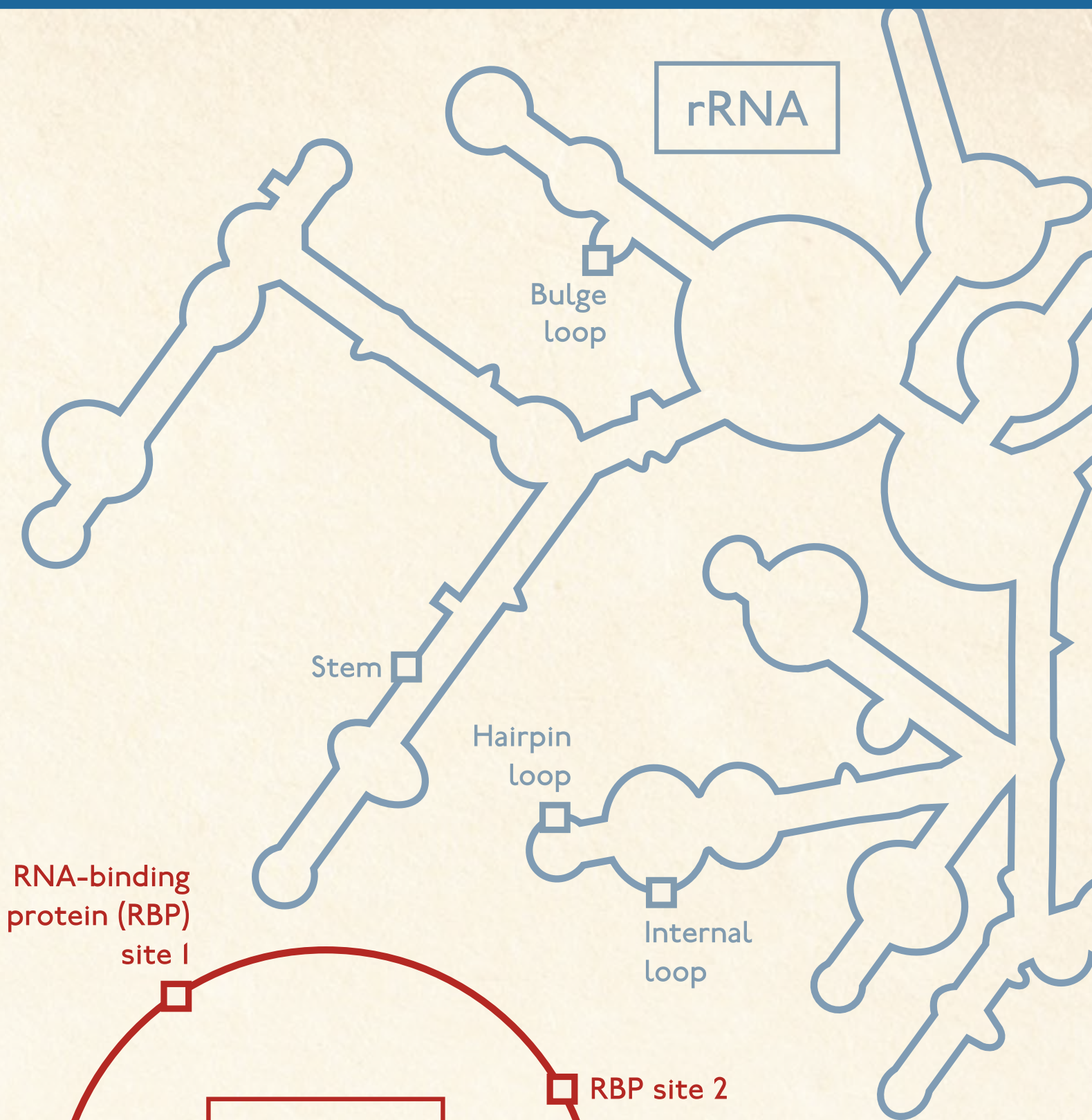


# RNA METRO MAP



**Linear Complexity**

Combinatorial usage of alternative transcription start sites, termination sites and splicing can give rise to a striking variation of mRNAs, which may be differentially expressed in response to a stimulus, across development and cell types. Highly specific and quantitative RNA measurement techniques will further our understanding of this diversity.

**RNA as Medicine**

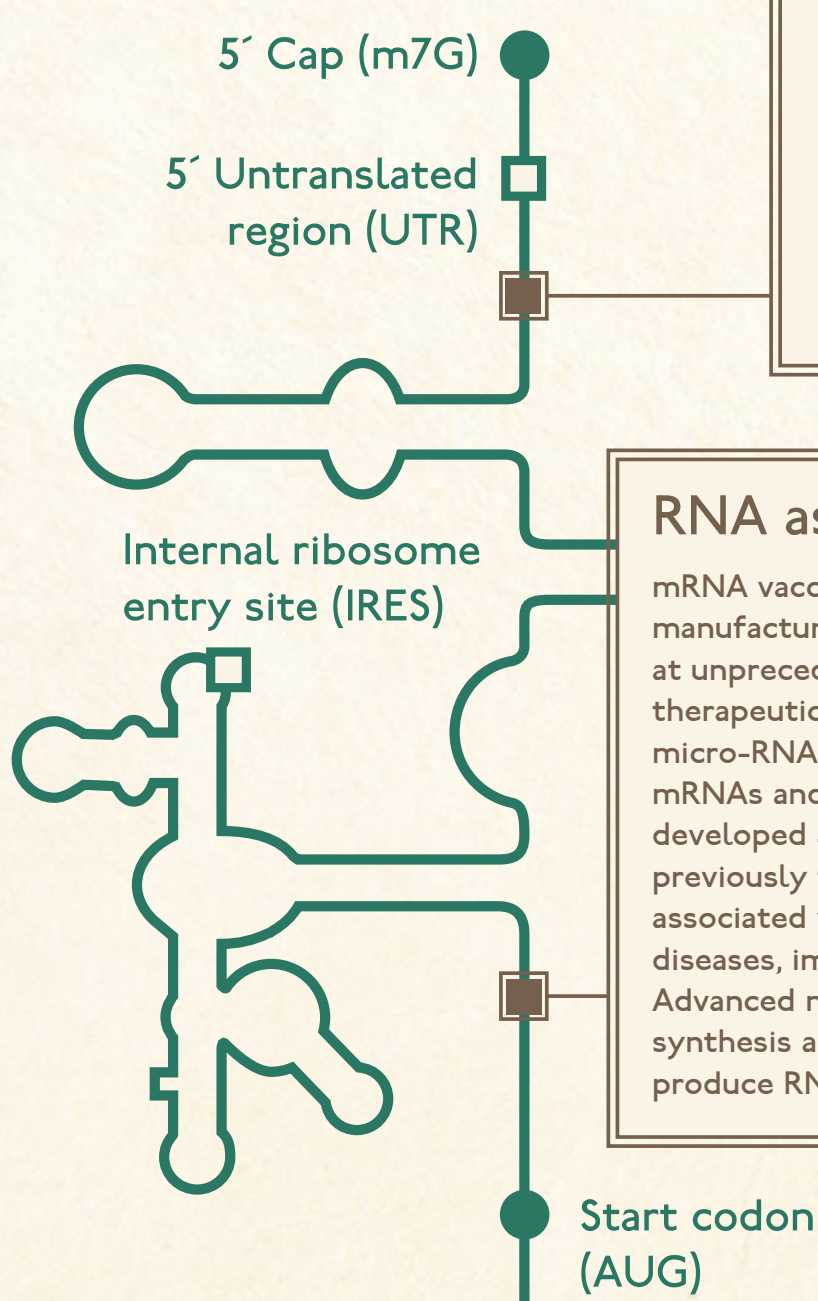
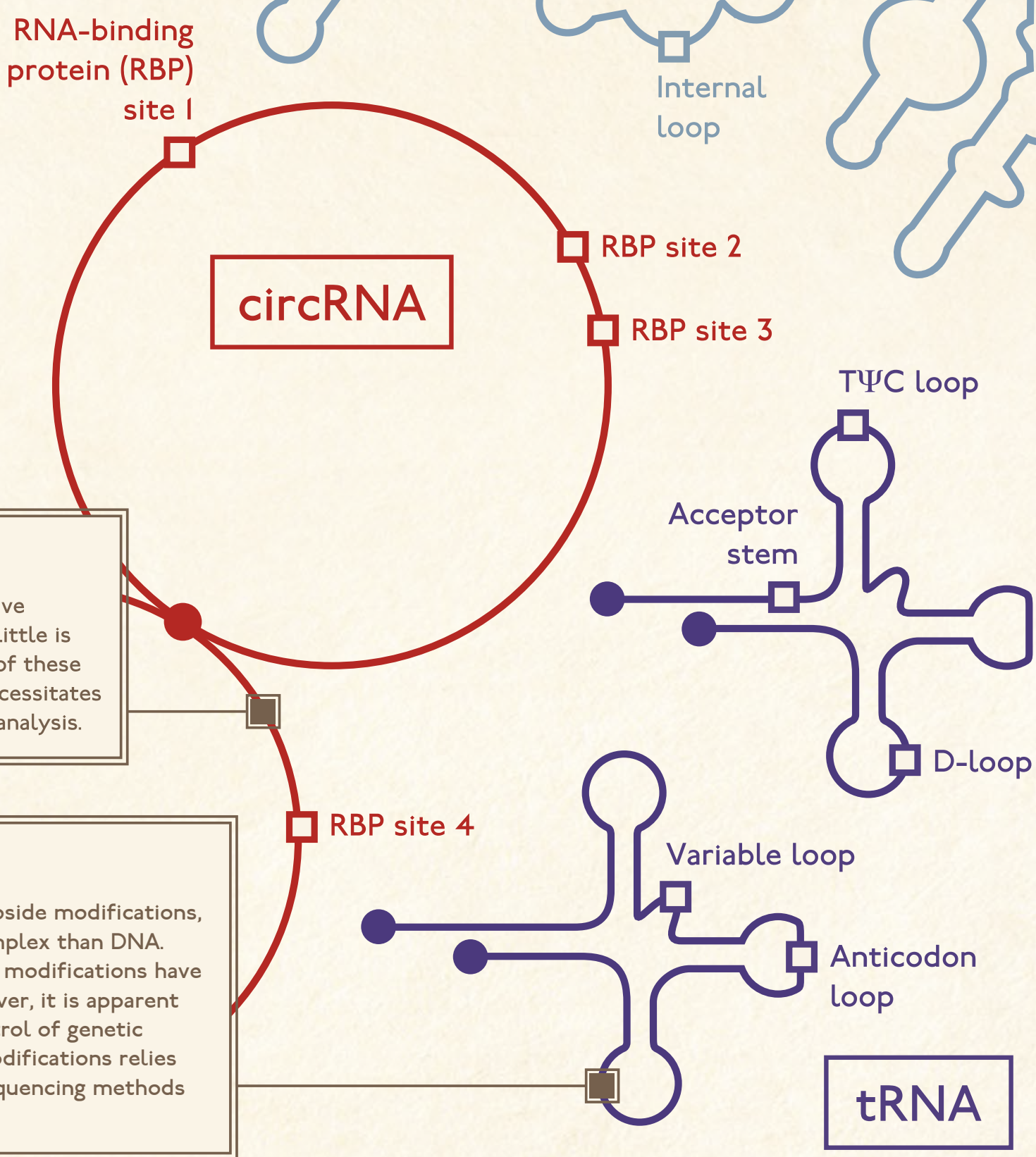
mRNA vaccines were rapidly developed and manufactured during the SARS-CoV-2 pandemic at unprecedented scale and speed. RNA-based therapeutics (utilizing short interfering RNA, micro-RNAs, antisense oligonucleotides, synthetic mRNAs and RNA-guided genome editing) have been developed as a novel modality for targets that were previously thought to be undruggable, including those associated with rare genetic disorders, infectious diseases, immunotherapy and personalized medicine. Advanced manufacturing approaches for enzymatic synthesis and manipulation of RNA are required to produce RNA for biopharmaceutical applications.

**Endless RNA**

Circular RNA is the outcome of alternative processing of a linear mRNA precursor. Little is known about the biological significance of these structures, and their unique topology necessitates new approaches for their detection and analysis.

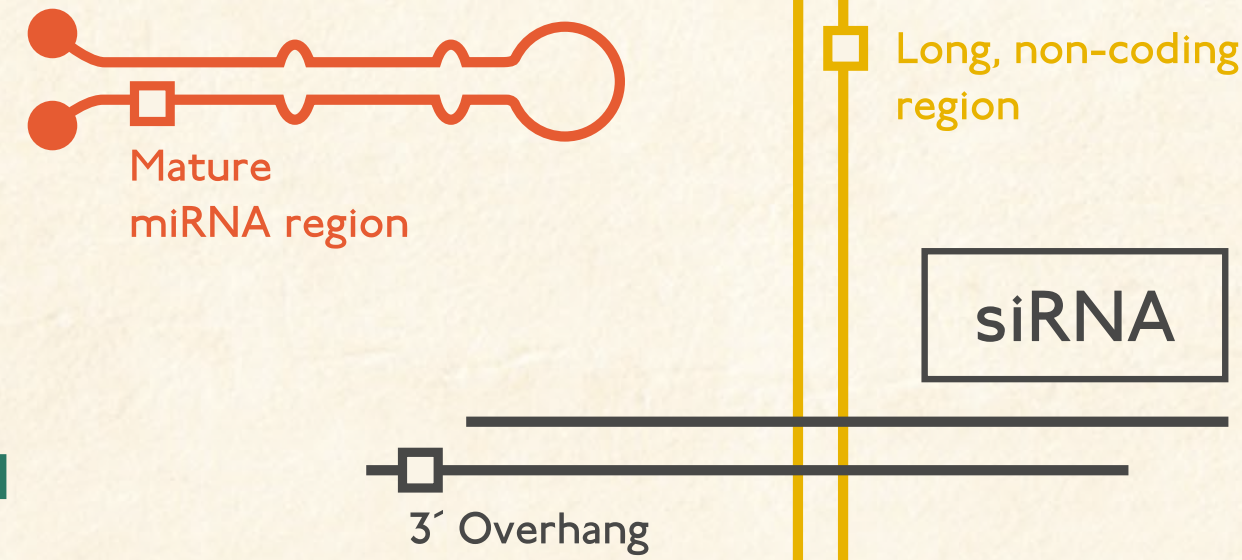
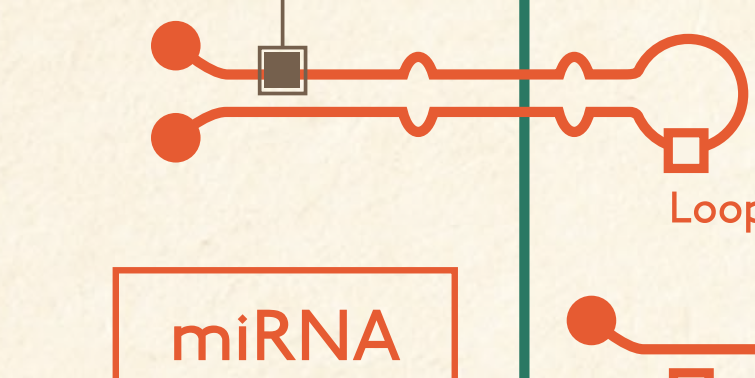
**Chemical Diversity**

With more than 100 possible nucleoside modifications, RNA is vastly more chemically-complex than DNA. The biological significance of these modifications have just begun to be understood, however, it is apparent that they represent a dynamic control of genetic information. The study of these modifications relies on variations of next generation sequencing methods to allow their precise mapping.



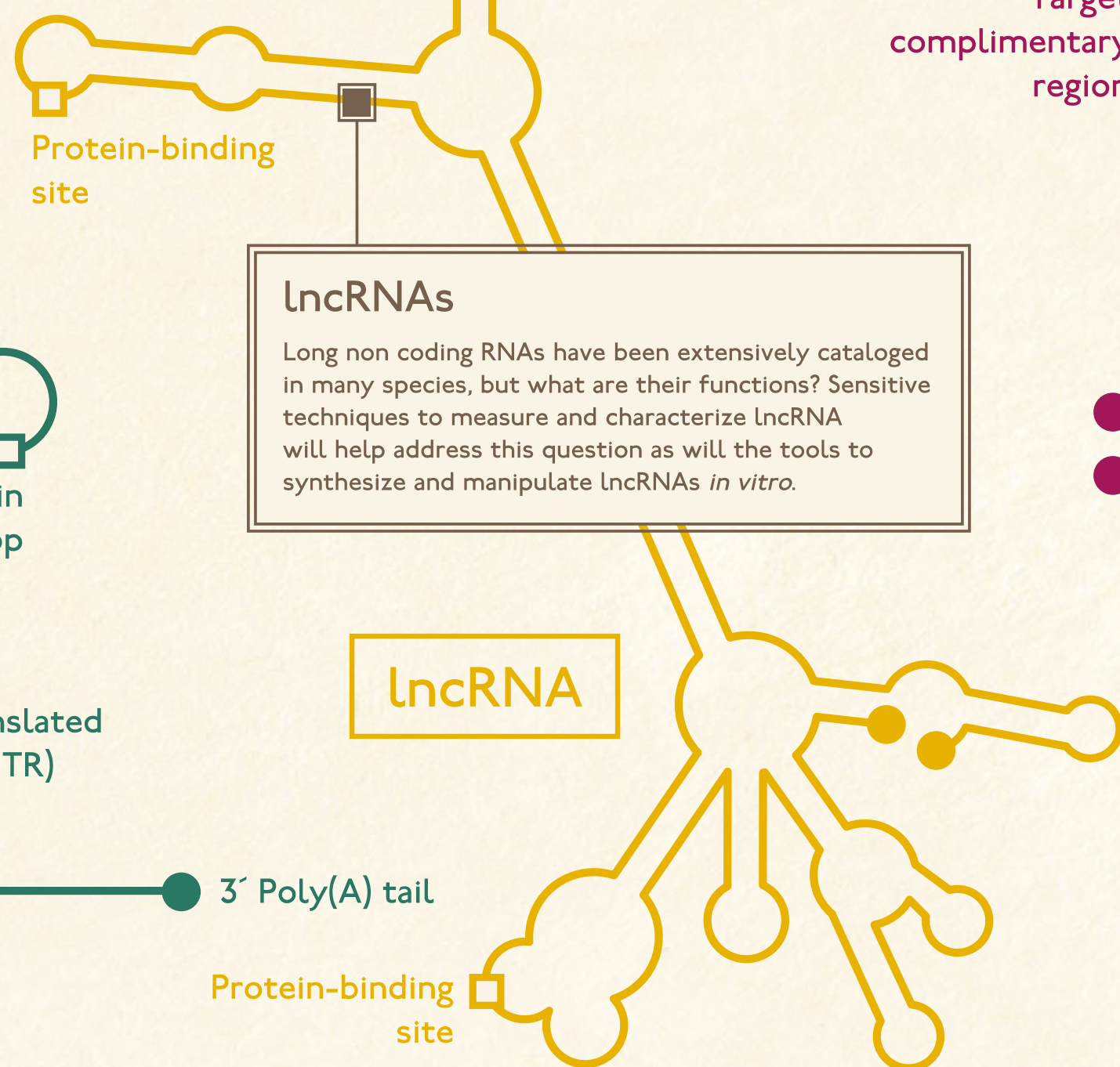
**Action at a Distance**

Some intact RNAs and specific RNA fragments travel from their cells of origin to other cells or into the circulation. Their biological significance is just beginning to be understood. Cataloging, quantifying and characterizing traveling RNAs will require special tools and approaches.



**lncRNAs**

Long non coding RNAs have been extensively cataloged in many species, but what are their functions? Sensitive techniques to measure and characterize lncRNA will help address this question as will the tools to synthesize and manipulate lncRNAs *in vitro*.



## LET PRODUCTS FROM NEB HELP YOU NAVIGATE THE COMPLEXITY OF RNA

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ShortCut® RNase III  
RNase H & RNase HII  
RNase R  
XRN-1  
Monarch® RNase A

### RNase Inhibitors

RNase Inhibitor, Human Placenta & Murine  
Ribonucleoside Vanadyl Complex

### RNA Modifying Enzymes

mRNA Cap 2'-O-Methyltransferase  
5' Deadenylase  
RNA 5' Pyrophosphohydrolase (RppH)  
Vaccinia Capping System  
Faustovirus Capping Enzyme  
Sce PUS1  
NudC Pyrophosphatase  
mRNA Decapping Enzyme

### Nucleotides & Cap Analogs

Modified Nucleotides  
Pyrophosphatase  
3'-Biotin-GTP  
3'-Desthiobiotin-GTP  
m7G(5')ppp(5')G RNA Cap Structure Analog  
m7G(5')ppp(5')A RNA Cap Structure Analog  
G(5')ppp(5')A RNA Cap Structure Analog  
G(5')ppp(5')G RNA Cap Structure Analog  
3'-O-Me-m7G(5')ppp(5')G RNA Cap Structure Analog

### In Vitro Transcription Kits

HiScribe® T7 mRNA Kit with CleanCap® Reagent AG  
HiScribe T7 High Yield RNA Synthesis Kit  
HiScribe T7 Quick High Yield RNA Synthesis Kit  
HiScribe T7 ARCA mRNA Kit with and without tailing  
HiScribe SP6 RNA Synthesis Kit  
EnGen® sgRNA Synthesis Kit, *S. pyogenes*

### RNA Polymerases

RNA Polymerases (T7, SP6, T3)  
*E. coli* RNA Polymerase, Core & Holo Enzyme  
*E. coli* Poly(A) Polymerase  
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### Ligases

T4 RNA Ligase I (ssRNA Ligase)  
T4 RNA Ligase 2  
T4 RNA Ligase 2, truncated  
T4 RNA Ligase 2, truncated KQ  
5' DNA Adenylation Kit  
SplintR® Ligase  
Thermostable 5' AppDNA/RNA Ligase  
T4 RNA Ligase 2, truncated K227Q  
RtcB Ligase  
Poly(U) Polymerase

### Ladders

ssRNA & dsRNA Ladders  
Low Range ssRNA Ladder  
microRNA Marker

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Luna® Universal One-Step RT-qPCR Kit  
Luna Universal Probe One-Step RT-qPCR Kit  
LyoPrime Luna™ Probe One-Step RT-qPCR Mix with UDG  
LunaScript® RT SuperMix Kit  
LunaScript RT Master Mix Kit (Primer-free)  
LunaScript Multiplex One-Step RT-PCR Kit  
OneTaq® One-Step RT-PCR Kit  
OneTaq RT-PCR Kit

### Purification & Isolation

Monarch Total RNA Miniprep Kit  
Monarch Spin RNA Cleanup Kits (10 µg, 50 µg, 500 µg)  
Epimark® N6-Methyladenosine Enrichment Kit  
Oligo (dT)<sub>25</sub>-Cellulose Beads  
Magnetic mRNA Isolation Kit

### NEBNext® Reagents for RNA-seq

Low-bias Small RNA Library Prep Kit  
Ultra™ II RNA Library Prep Kits (Directional & Non-directional)  
rRNA Depletion Kit v2 (Human/Mouse/Rat)  
Globin & rRNA Depletion Kit (Human/Mouse/Rat)  
rRNA Depletion Kit (Bacteria)  
RNA Depletion Core Reagent Set, for customized depletion  
Immune Sequencing Kit (Human & Mouse)  
Poly(A) mRNA Magnetic Isolation Module  
Single Cell/Low Input RNA Library Prep Kit

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