



mRNA purification

Chemical and resin compatibility for downstream purification

Helping enhance yield and purity
of mRNA capture resins

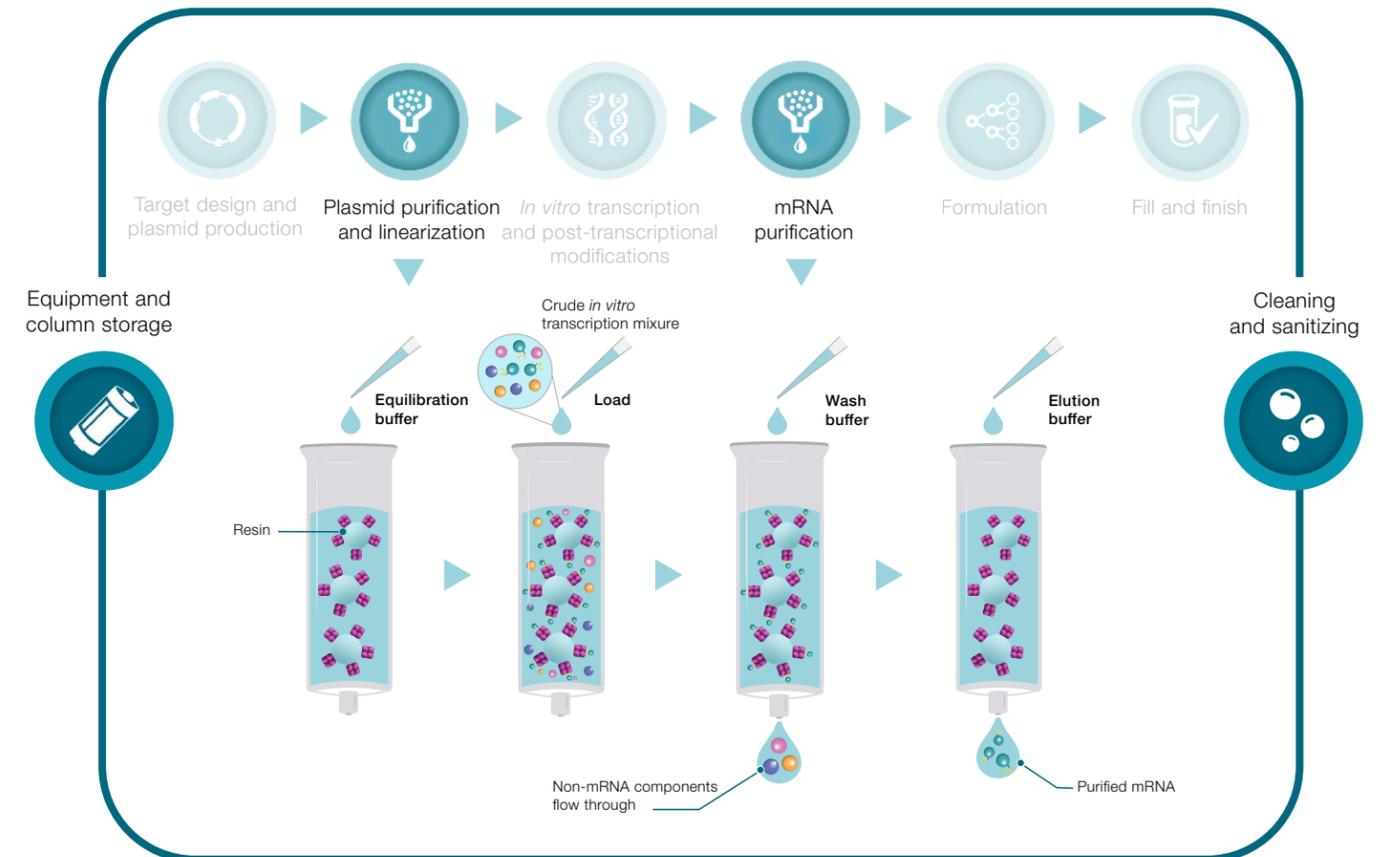
Amplify your mRNA downstream processes with the right resin and buffer combinations

Messenger ribonucleic acid (mRNA) is used in modern therapeutics such as vaccines, gene therapy, and personalized medicine to provide treatment for various diseases and genetic disorders. Achieving high purity and yield in the manufacture of these mRNA therapeutics is essential for treatment efficacy and patient safety. High-quality resins and buffers play a pivotal role in optimizing the purification process, helping to ensure that the final product meets stringent quality standards.

Thermo Fisher Scientific offers a comprehensive range of manufactured and sourced products that work synergistically enhance downstream process performance and product quality. Our chromatography resins and chemicals support viral vector purification as a vast purification toolkit with a variety of chemistries for high yield, selectivity, and purity. Our ongoing supply chain support can help processes run smoothly so you can stay focused on developing lifesaving therapies.

mRNA chromatography process needs

An effective method for mRNA purification by chromatography relies heavily on complementary base pairing in the capture step. Each chromatography unit operation involves equilibration, bind, wash, elute, and clean-in-place steps. Equilibration conditions the column with a buffer to promote optimal mRNA binding. The crude *in vitro* transcription sample is applied during the bind step under consistent buffer conditions. Washing helps remove non-specifically bound impurities, often using buffers with added salts. Elution releases the nucleic acids by altering buffer conditions, such as pH or salt concentration.



The proper selection of resins and buffers enables efficient and effective mRNA purification. The Thermo Scientific™ POROS™ Oligo (dT)25 Affinity Resin helps to simplify the mRNA purification workflow by enabling:

- Easy mRNA purification from crude transcription reaction or transcription mixture
- Reduction in the complexity of subsequent polish steps
- High dynamic binding capacity and high recovery



Quality raw materials to complement your resins

Using high-quality chemicals in chromatography purification is essential for maintaining resin performance, enhancing efficiency for higher yields and purity, reducing contamination risks, and preserving the integrity and longevity of the resin; all of which can contribute to helping lower production costs.

Chemicals produced under current Good Manufacturing Practices (cGMP) offer additional benefits critical for high-stakes applications such as large-molecule drug development, research, clinical trials, and production. These benefits often include consistency and reliability through stringent quality standards, enhanced safety by reducing contamination risks, and compliance with regulatory requirements essential for these applications.

Benefits of adopting GMP materials



Streamlined regulatory compliance:

Facilitates early alignment with regulatory expectations



Tech transfer and scale-up:

Materials aligned with commercial production standards, minimizing later adjustments



Cost and time efficiency:

Reduces comparability studies and delays, helping to accelerate time to market

Recommended chemicals, process liquids, and buffers for mRNA purification steps

	Equilibration	Wash	Elution	Clean-in -place	Buffer additive
EDTA (CAS 60-00-4)			•		•
Ethanol (CAS 64-17-5)				•	
Hydrochloric acid (CAS 7647-01-0)					•
Sodium chloride (CAS 7647-14-5)	•	•			
Sodium hydroxide (CAS 1310-73-2)				•	•
Sodium citrate (CAS 68-04-2)			•		•
Tromethamine (Tris, Tris Base) (CAS 77-86-1)	•	•			
TRIS Hydrochloride (Tris HCl) (CAS 1185-53-1)	•	•			
Water (DNase/RNase-Free) (CAS 7732-18-5)			•		

Our chemical network

Thermo Fisher offers a broad portfolio of multicompendial chemicals both through our global network of trusted manufacturers and suppliers, as well as our in-house manufacturing of Gibco™ Process Liquids and Buffers. We deliver chemicals in dry and liquid formats, with volumes starting at 1 kg and 100 mL, respectively. Our comprehensive quality documentation for sourced chemicals, process liquids, and buffers helps ensure seamless integration into your workflows.



Manufacturers and suppliers

- **Ajinomoto Group**
- **Avantor**
- **BASF**
- **BioSpectra**
- BIOVECTRA
- DFE Pharma
- **Dr. Paul Lohmann**
- Gibco™ feeds and supplements
- **Gibco Process Liquids and Buffers**
- **Greenfield Global**
- **Hawkins**
- **Macco Organiques**
- **Quality Chemicals**
- **Spectrum Chemical**
- STERIS
- Veltek



Categories

- **Acid solutions**
- **Amino acids**
- **Base solutions**
- **Biological buffers**
- Biological reagents
- Carbohydrates
- Cleaning agents and disinfectants
- Denaturants
- Minerals and vitamins
- **Salts**
- **Solvents**
- Supplements
- Surfactants and emulsifiers
- **Water**



Grades

- ACS (American Chemical Society)
- **GMP**
- **Pharma**
- Reagent
- Technical



Compendia

- British Pharmacopoeia (BP)
- Chinese Pharmacopoeia (ChP)
- European Pharmacopoeia (Ph Eur.)
- Food Chemicals Codex (FCC)
- Japanese Pharmacopoeia (JP)
- National Formulary (NF)
- United States Pharmacopoeia (USP)



Documentation

- Certificate of Analysis (CoA)
- Certification of Origin (CoO)
- Drug Master File (DMF)*
- Regulatory certificates
- Safety Data Sheet (SDS)
- Technical Data Sheet (TDS)

The blue bolded font denotes suppliers, categories, and grades most applicable to downstream purification processes.
* DMFs are available for selected products.

Advanced chemical supply chain support

We offer a suite of chemical services and supply chain support to complement your downstream operations, including storage, inventory management, sampling, recycling, and more. Our facilities meet ISO 9001:2015, cGMP, and good distribution practices (GDP) standards, supporting reduced risks of order nonconformances and contamination. We offer robust support for quality agreements and vendor questionnaires, helping to ensure that all regulatory and compliance requirements are met efficiently and effectively. Our team of technical specialists in cGMP chemical supply chain management can help your efforts for quality compliance and prevent process interruptions or delays.

We strive to help your team create a reliable chemical supply chain, supporting your business continuity and accelerating your speed to market.



Storage



Sourcing & procurement



Vendor managed inventory



Container recycling, reuse & disposal



Raw material sampling



Why source chemicals through Thermo Fisher?

Streamline operations

Access chemical products backed by redundant processes and supported by cGMP- and GDP-compliant supply chain infrastructure

Trusted collaborations

Build a reliable supply of available, consistently manufactured chemicals through our global network of chemical manufacturers and suppliers

Comprehensive support

Receive extensive technical support and customer service for raw material forecasting and product usage advice

Experience

Leverage the combined experience of Thermo Fisher and other chemical manufacturer and supplier teams to help advance your processes

Ordering information

Description	Volume	Cat. No.
	50 mL	A47382
	250 mL	A47383
POROS Oligo (dT)25 Affinity Resin	1,000 mL	A47384
	5,000 mL	A47385
	10,000 mL	A47386

Learn more at thermofisher.com/downstreamchemicals

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