# innoQ DNA STAIN

## RELIABLE DNA & RNA VISUALIZATION FOR ROUTINE ELECTROPHORESIS

Clear nucleic acid visualization after electrophoresis is a critical step in molecular biology workflows. It allows researchers to confirm PCR or RT-PCR amplification, evaluate DNA/RNA integrity, and document experimental outcomes for reporting, troubleshooting, or quality control.

Because gel imaging is often performed daily, the staining reagent plays a major role in result quality: it directly affects band sharpness, signal intensity, background noise, and ultimately how confidently data can be interpreted.

innoQ DNA Stain is a fluorescent nucleic acid gel stain designed for routine electrophoresis. It enables sensitive DNA and RNA detection while keeping workflows straightforward and consistent. Laboratories can implement innoQ without changing equipment, imaging systems, or established protocols.

### WHY NUCLEIC ACID GEL STAINS MATTER IN EVERYDAY WORKFLOWS

Nucleic acid gel stains are fluorescent molecules that bind to DNA or RNA and emit light when exposed to specific excitation wavelengths. After electrophoretic separation, the stained fragments become visible as distinct bands, enabling quick confirmation of sample identity and quality.

These stains are widely used to:

- Verify PCR and RT-PCR amplification products
- Analyse restriction enzyme digestions
- Assess plasmid DNA quality and integrity
- Visualize RNA after gel separation
- Generate clear gel documentation for traceability

Since these applications are routine in most labs, a gel stain must deliver consistent performance, reproducibility, and reliable fluorescence across runs.

### A QUICK LOOK AT THE SCIENCE: HOW FLUORESCENT DNA/RNA DYES WORK

Most modern nucleic acid stains work through one (or a combination) of two mechanisms:

**1) Intercalation**

The dye inserts between stacked base pairs in DNA (and in many cases RNA). This binding increases the dye's rigidity and greatly enhances fluorescence.

**2) Groove binding**

The dye binds along the major or minor groove of the nucleic acid helix. This also stabilizes the dye structure and increases fluorescence output.

In both cases, the principle is the same: the dye fluoresces weakly when free in solution, but strongly when bound to nucleic acids, producing a high-contrast signal.

Compared to traditional ethidium bromide, many newer stains are engineered to offer improved handling profiles and compatibility with blue-light excitation, reducing UV exposure and minimizing nucleic acid damage during gel excision.

**TECHNICAL PERFORMANCE AND OPTICAL COMPATIBILITY**

innoQ DNA Stain provides stable, reproducible fluorescence suitable for routine detection of double-stranded DNA (dsDNA), single-stranded DNA (ssDNA) and RNA.

It shows optimal spectral properties around ~490 nm (excitation) and ~530 nm (emission). These characteristics make it compatible with standard imaging setups, including UV and blue-light transilluminators. In most laboratories, innoQ can be adopted immediately without replacing existing gel documentation systems.

**HIGHLY CONCENTRATED FORMAT FOR COST-EFFECTIVE USE**

innoQ is supplied as a 25,000X concentrated solution, allowing laboratories to stain a high number of gels using very small volumes.

This concentrated format supports:

- Efficient reagent usage
- Cost control per gel
- Simplified inventory management
- Consistent performance across multiple experiments

**COMPATIBLE WITH AGAROSE AND POLYACRYLAMIDE GELS**

innoQ is suitable for both major electrophoresis formats:

- Agarose gels: Supports clear visualization of DNA and RNA across common fragment size ranges used in PCR analysis, plasmid checks, and restriction digests.
- Polyacrylamide gels (PAGE): Enables detection of smaller fragments and high-resolution separations, where sharp band definition is essential.

This broad compatibility allows laboratories to rely on one stain across multiple workflows and gel types.

## FLEXIBLE WORKFLOW OPTIONS: PRE-STAINING OR POST-STAINING

To accommodate different lab preferences, innoQ supports both common staining approaches:

**Pre-staining:** The stain is added directly to molten gel before casting.

✓ Stains nucleic acids during electrophoresis

✓ Minimizes post-run handling

✓ Speeds up workflow

**Post-staining:** The gel is stained after electrophoresis by immersion in a staining solution.

✓ Suitable for selective staining workflows

✓ Useful for different gel thicknesses

✓ Preferred by labs optimizing signal-to-background

Both options provide flexibility while keeping protocols simple and familiar.

## STORAGE, HANDLING, AND ROUTINE LAB USE

innoQ is designed for everyday laboratory handling. For best performance, users should protect the stain from light, store between 2 °C and 25 °C and use refrigerated storage for extended stability.

Its non-toxic and non-mutagenic classification supports safe use in shared laboratory spaces, teaching environments, and routine molecular biology settings.

## COMPATIBLE WITH DOWNSTREAM APPLICATIONS

After imaging, DNA or RNA bands stained with innoQ can be excised and purified using standard methods. The recovered nucleic acids remain suitable for downstream applications such as cloning, sequencing, enzymatic reactions, further amplification and analysis.

This makes innoQ appropriate for both analytical gels and preparative workflows.

## A Practical DNA Gel Stain for Daily Electrophoresis

innoQ DNA Stain meets the key requirements of a modern nucleic acid gel stain: sensitivity, broad compatibility, ease of use, and reliable performance.

Its concentrated format, dual staining flexibility, and compatibility with agarose and polyacrylamide gels make it an excellent option for laboratories seeking consistent results without disrupting established workflows.

**CONTENT SUMMARY**

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| **PRODUCT TYPE** | Fluorescent nucleic acid gel stain |
| **TARGET MOLECULES** | dsDNA, ssDNA, RNA |
| **MAIN APPLICATIONS** | PCR / RT-PCR products, restriction digests, plasmid analysis, RNA integrity assessment, gel documentation |
| **BINDING MECHANISM** | Intercalation and/or groove binding (enhanced fluorescence upon nucleic acid binding) |
| **EXCITATION MAXIMUM (ΛEX)** | ~490 nm |
| **EMISSION MAXIMUM (ΛEM)** | ~530 nm |
| **OPTICAL COMPATIBILITY** | UV and blue-light transilluminators |
| **GEL COMPATIBILITY** | Agarose and polyacrylamide (PAGE) |
| **STAINING METHODS** | Pre-cast (in-gel) staining and post-staining (gel immersion) |
| **STOCK CONCENTRATION** | 25,000X |
| **WORKING CONCENTRATION** | Typically 1X (according to protocol) |
| **SIGNAL PERFORMANCE** | High signal intensity with low background |
| **BAND RESOLUTION** | Sharp, well-defined bands |
| **DOWNSTREAM COMPATIBILITY** | Suitable for band excision and purification (cloning, sequencing, PCR, enzymatic reactions) |
| **STORAGE CONDITIONS** | Protect from light; store at 2–25 °C (refrigeration recommended for extended storage) |
| **SAFETY PROFILE** | Designed as a safer alternative to ethidium bromide |