



Cod UNG

For diagnostic assays

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Heat-labile Cod Uracil-DNA Glycosylase (UNG) is an integral component of direct PCR, qPCR, RT-qPCR and RT-LAMP assays to ensure rapid and accurate genetic testing in molecular diagnostics. Maintaining the highest assay specificity and sensitivity is of utmost concern, particularly when the concentration of the target molecule is very low. Even minute amounts of DNA contaminants can lead to decreased sensitivity of diagnostic assays.

Heat-labile Uracil-DNA Glycosylase

With its unparalleled high activity at ambient temperatures, Cod UNG maintains the efficiency and sensitivity of PCR required in precision diagnostics, while preventing false positive results. Unlike other commercially available, heat-labile Uracil-DNA Glycosylases, Cod UNG is irreversibly inactivated. This ensures that sample integrity is maintained long-term, regardless of storage conditions, thereby allowing further utilization of PCR products.

Cod UNG is suitable for use with a broad range of buffer conditions and diverse sample types. The robust properties of Cod UNG make it easy to use, amenable to automation, and useful in a wide variety of workflow conditions.



Heat-labile

Compatible with reverse transcription at $\geq 50^{\circ}\text{C}$



Contamination control

Ideal for contamination control in RT-PCR, RT-qPCR, qPCR, kPCR and RT-LAMP



Post-PCR Analysis

Enables post-PCR analysis

Cod UNG restores assay sensitivity

In molecular diagnostics, such as with pathogen detection, assay sensitivity is of greatest importance when there is limited target molecules in samples. The presence of carryover DNA severely reduces the sensitivity of qPCR assays. Implementation of Cod UNG removes contaminants and restores sensitivity and dynamic range while the integrity of PCR products is maintained.

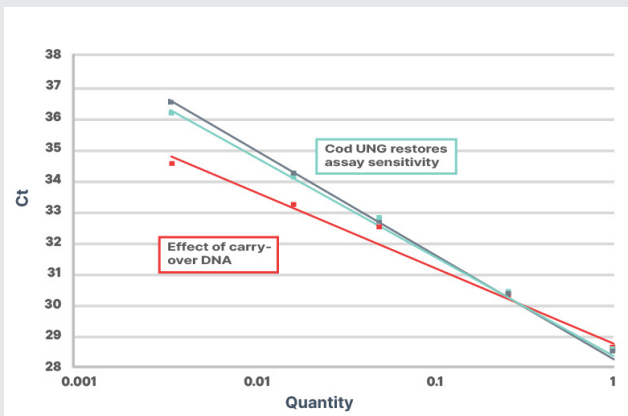


Fig 1. Cod UNG restores sensitivity

Cod UNG restores sensitivity. A serial dilution of MS2 viral RNA in human serum was prepared. The mixture was spiked with uracil containing amplicons to mimic carry-over DNA. RNA was quantified using a standard one-step RT-qPCR. The presence of carry-over DNA severely reduced the sensitivity of the assay (red). Inclusion of Cod UNG restored assay sensitivity (green), control sample (grey).

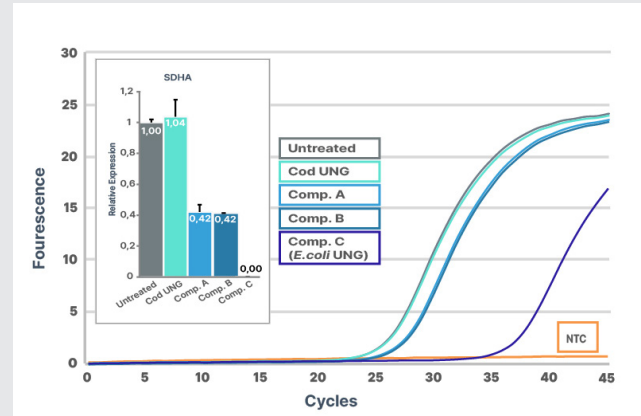


Fig 2. Cod UNG remains inactive

Cod UNG remains inactive. RT-qPCR on human total RNA in presence of Cod UNG, UNG from *E. coli*, and two competitor cold-adapted UNG's was performed according to protocol. The failure of competitors A and B (cold-adapted UNG's from marine microorganisms) to fully inactivate at 50-60°C leads to loss of cDNA and the integrity of the PCR reaction.

Optimal for viral diagnostics

One of the challenges with viral diagnostic detection is the inherent genomic variability of viruses. The low activation temperature of Cod UNG makes it ideal in viral diagnostics. By lowering the assay temperature during primer annealing, the tolerance for mismatch in the primer-binding region increases. This enables broader detection of viral subtypes, which reduces the risk of false negatives in diagnostic assays. With its high activity at ambient temperatures and inactivity at 50°C, Cod UNG is optimal for RT-qPCR protocols in viral diagnostic workflows.



Compatible with a wide range of samples

Blood samples are frequently used in direct PCR diagnostics for pathogen detection. Materials found in blood samples can often inhibit enzymes used in PCR assays, including uracil-DNA glycosylases. Cod UNG has a high tolerance for components in whole blood and plasma; such as serum and anti-coagulants.

Due to its compatibility with a wide-range of biological samples types, Cod UNG is ideal for use in direct PCR diagnostics.



Effect of blood and anti-coagulants on Cod UNG

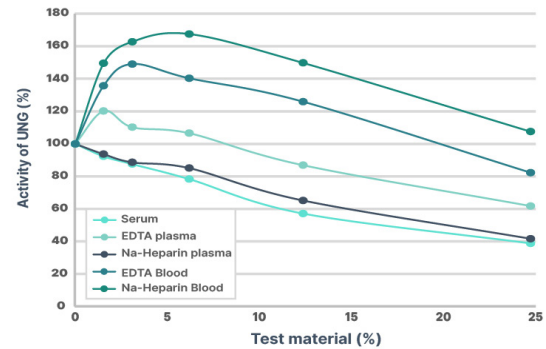


Fig 3. Cod UNG activity in the presence of blood components

Cod UNG activity in the presence of blood components.

Cod UNG has a high tolerance for blood components such as serum and anti-coagulants, including EDTA and Na-Heparin.

Amenable to automation and workflow conditions

The robust properties of Cod UNG make it easy to use and amenable to automation and a wide variety of workflow conditions. The inactivation of other commercially available, heat-labile UNGs, is highly dependent on buffer composition and pH. Cod UNG tolerates a breadth of buffer conditions and is the only heat-labile enzyme to remain irreversibly inactivated already within 5 minutes at 50°C.

Cod UNG is highly suitable for high-throughput and automated workflows due to its:

- ✓ unparalleled activity at ambient temperatures.
- ✓ inactive at 50°C.
- ✓ complete and irreversible inactivation after PCR.
- ✓ activity in a diverse range of experimental conditions.
- ✓ compatibility with a wide range of biological sample types.

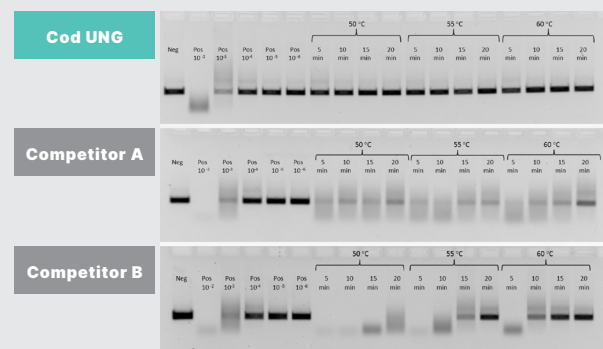


Fig 4. Cod UNG is irreversibly heat-inactivated

Cod UNG is irreversibly heat-inactivated. Cod UNG was tested side-by-side two commercially available, heat-labile UNG enzymes from cold-adapted marine microorganisms in a typical RT buffer. The enzymes were heat-inactivated at the indicated time and temperatures. Following inactivation, PCR product was added to the samples and incubated for three hours at 37°C. Despite inactivation, upon incubation at 37°C, competitor enzymes degraded DNA (faint bands), while Cod UNG remained inactive in all buffer conditions.

No license required

At ArcticZymes, we pride ourselves on always offering seamless accessibility to our high-quality products. Produced under ISO 13485, our enzymes are sold under a “no license required” policy to ensure that our customers are not restricted by legal burdens, now or with their future use. In addition, we offer Cod UNG in a flex-

ible format and are readily available to discuss your custom needs. To meet the European Commission’s REACH requirements, Cod UNG is available as a Triton X-100-free formulation (Cod UNG Triton FREE). For added flexibility, when lyophilization may be desired, Cod UNG is also available in a glycerol-free format.

	Article no.	Pack size*	Concentration
Cod UNG	70500-201	100 U	1 U/μl
	70500-202	1000 U	1 U/μl
	70500-110	10 kU	1 U/μl
	70500-150	50 kU	50 U/μl
	70500-151	50 kU	1 U/μl
	70500-100	Custom	Custom
Cod UNG Triton FREE	70501-201	100 U	1 U/μl
	70501-202	1000 U	1 U/μl
	70501-110	10 kU	1 U/μl
	70501-150	50 kU	50 U/μl
	70501-151	50 kU	1 U/μl
	70501-100	Custom	Custom
Cod UNG Glycerol FREE	70510-105	5 kU	50 U/μl
	70510-150	50 kU	50 U/μl
	70510-100	Custom	Custom
Cod UNG Glycerol and Triton FREE	70511-105	5 kU	50 U/μl
	70511-150	50 kU	50 U/μl
	70511-100	Custom	Custom

*One unit of UNG is defined as the amount of enzyme required to release 1 nmol uracil from uracil-containing DNA per hour at 37°C in a buffer consisting of 70 mM Tris-HCL pH 8.0 (@25°C), 10 mM NaCl, 1 mM EDTA and 0.1 mg/ml BSA.

Your OEM Partner to deliver novel solutions for genomics and proteomics

Quality

ArcticZymes is dedicated to the quality of our products, and certified according to ISO 13485:2016.

Additional Information

We are pleased to provide data and information relating to Cod UNG. Available data includes; shelf life, buffer storage conditions, pH, specific activity data. For more information please check our website www.arcticzymes.com

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