Integrated DNA Technologies

**RNase H2 Enzyme** is a recombinant endoribonuclease that binds to RNA-DNA duplexes, and cleaves the RNA strand leaving a 5’phosphate and a 3’hydroxyl group. The RNase H2 enzyme differs from RNase H1 in that RNase H2 will cleave at a single ribonucleotide residue embedded within a heteroduplex. RNase H2 will not cleave single-stranded RNA.

**Source**
Codon optimized Pyrococcus abysii RNase H2 gene over-expressed in *E coli*.

**Enzyme requirements**
- monovalent cation: 50-75 mM K+/Na+ or 32 mM NH₄⁺
- divalent cation: 2-8 mM Mg++, 0.6-1.5 mM Mn++, or 0.5-0.75 mM Co++
- pH 8.0-8.4
- nonionic detergent: 0.01% Triton X100 or 0.01% Tween 20

**Temperature**
RNase H2 activity is optimal around 75 °C, with significant activity retained with temperatures as low as 50 °C. It retains maximal catalytic activity at 95°C for over 30 minutes.

**Substrates**
RNA-DNA duplex with as little as a single ribose-base embedded in a DNA strand. If the substrate contains a stretch of ribose bases, cleavage will occur at multiple sites within the RNA containing strand. In the case of a single RNA containing duplex, a 3’OH and a 5’phosphate containing oligonucleotides are produced.

**Example** S-rC 14-1-15 (RNA base lowercase)

5’ CTCGTGAGGTGATGAGGAGATGGGAGGCG 3’
3’ GAGCACTCCACTACGTCTACCCTCCGC 5’

**Cleavage products**
5’ CTCGTGAGGTGATG-OH
/5Phos/cAGGAGATGGAGGCG 3’
5’CGCCTCCCATCTCTGTCATCACCTACAGG 3’

Maximal cleavage efficiency requires the positioning of the RNA base to be 8-10 bases in from the 5’ end, and 4 or more bases from the 3’ end.

**Unit definition**
One enzymatic unit is the amount of enzyme needed to cleave 1 nmole of the DNA-RNA-DNA heteroduplex substrate S-rC 14-1-15 (shown above) per minute at 70°C in Mg++ Cleavage Buffer (10 mM Tris-HCl pH 8.0, 50 mM NaCl, 4 mM MgCl₂, 10 μg/mL BSA)

5’ CTCGTGAGGTGATGAGGAGATGGGAGGCG 3’
3’ GAGCACTCCACTACGTCTACCCTCCGC 5’

**Molecular weight**
- 27,573.6 daltons

**Storage conditions**
IDT recommends storage at -20°C in low protein binding tubes.

**Research Purposes Only:** RNase H2 enzyme is sold by IDT for the customer’s research purposes only. Except pursuant to a separate, written agreement with IDT, RNase H2 enzyme is not sold for use in any clinical, diagnostic, validation or therapeutic applications.