



Customizable Helicase Assay Kit

The Challenge: Helicases are enzymes that catalyze the transient unwinding of double stranded DNA (ds DNA) or RNA (ds RNA) molecules during routine biological processes such as DNA replication, repair, recombination, transcription and translation. The techniques that are currently available for assaying helicase activity are fairly complicated; they require the generation of helicase substrates and expertise to run. The kits that are commercially available today lack flexibility as the user is required to use the detection system that is included in the kit. Some kits yield data at only one time point and use radiolabeled substrates, while others, such as fluorescence based assays, offer real time data output, but are limited in that they may not be suitable for assays that require forked substrates and may not be suitable for determining the polarity of a novel helicase.

UMBI Solution: UMBI scientists have developed an effective and customizable PCR-based helicase assay. This method can be developed into a helicase kit that is easily tailored to suit the individual needs of the researchers. The kit contains a set of universal helicase substrates and a labeling buffer that includes the nucleotide of choice and a DNA polymerase. The user can generate a set of labeled substrates that are tailored to meet their specific needs. Users are also not restricted by the detection system as the kit can be customized to supply a radioactive, chemiluminescent or other suitable dye. At present, our investigators have successfully used this assay for several helicases from archaeal, bacterial and viral origins. The assay kit can be used for diagnostic purposes as well.

Commercial Applications:

- Custom helicase assay kit for DNA and RNA helicases
- Diagnostic kit suitable for detecting certain viruses and/or bacteria (if it has a unique helicase)
- Research tool to characterize a putative or a known helicase

Advantages:

- Able to assay the activity of helicases from different sources
- Not limited by detection system
- The customer chooses the desired detection methods
- Suitable for DNA and RNA helicases

Licensing Potential: UMBI is seeking non-exclusive and exclusive licensees to all or part of this technology.

Inventor & UMBI Reference: Kelman, 05-001

Relevant Publications: Shin, J.-H. and Kelman, Z. (2006). DNA unwinding assay using streptavidin-bound oligonucleotides. *BMC Mol. Biol.* 7, 43.

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