

Cell Lines Expressing Nuclear and/or Mitochondrial RNase H1

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Keywords: Research tool, cancer, upstream open Reading Frame (uORF), mtDNA, AUG, RNase H1, HEK293.

Summary: The National Institute of Child Health & Human Development ([NICHD](#)), [Program in Genomics of Differentiation](#), is seeking statements of capability or interest from parties interested in collaborative research to further co-develop small molecule inhibitors of RNase H1, especially in regards to genome instability, transcription, and translation..

Technology: RNase H1 has been shown to remove RNA/DNA hybrids and either too much or too little enzyme can lead to undesirable effects such as deletions of DNA. The gene encoding RNase H1 in mammalian cells produces two forms of the protein. One is targeted to the nucleus of the cell and the other to the mitochondrial organelle. To study the effects of expression as well as to understand the regulation of the frequency with which each form is made, NIH investigators constructed cells derived from HEK293 cells where expression of each or both forms is/are expressed only after addition of doxycycline as a small molecule inducer compound. The set of cell lines could be important in the process of analysis of RNA/DNA hybrids as each cell line expresses different amounts of each form.

Potential Commercial Applications:

- Research materials to study RNA/DNA hybrids

Competitive Advantages:

- Limited availability

Development Stage: Pre-clinical, *in vitro* data available

Patent Status: Research Material. Patent protection is not being pursued for this technology.

Publications:

1. Suzuki Y, et al. An upstream open reading frame and the context of the two AUG codons affect the abundance of mitochondrial and nuclear RNase H1. *Mol Cell Biol.* 2010 Nov;30(21):5123-34. [[PMID 20823270](#)]

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