New label-free method for direct RNase activity detection in biological samples

Tech ID: 27161 / UC Case 2015-626-0

ABSTRACT

Researchers at the University of California, Davis have developed a new and simple, label-free method to detect milligram levels of RNase activity in undiluted biological samples that is selective, accurate and scalable.

FULL DESCRIPTION

Traditionally, RNase activity of biological samples has been measured using ultraviolet based ELISAs for the detection of nucleic acids or degraded nucleosides. With limited accuracy and sensitivity, current alternative methods include the use of expensive fluorophore-labeled antibodies and dangerous radioactive isotope-labeled RNA substrates. Both these methods often require the significant dilution of high RNase containing samples into a detectable range, altering the precision and accuracy of these assay methods. Therefore, there is a need for a method that is selective, accurate, inexpensive and safe and can be used with undiluted biological samples.

Researchers at the University of California, Davis have developed a unique, fluorescence-based method for quantifying RNase activity using label-free RNA substrates produced in E. coli on a large scale. The method uses a stable analyte that, upon incubation with an RNase containing biological sample, fluoresces, allowing for the direct and specific milligram level detection of RNases in undiluted test samples. The substrates are light and temperature stable and are not active until they are in the presence of RNases. This method offers a simple and cost-effective means to measure RNase activity in undiluted biological samples without compromising sensitivity or specificity.

APPLICATIONS

· Diagnosis/prognosis of RNase dysregulation in (but not limited to): serum, saliva, sweat, tears, milk, semen, urine, vaginal secretions and tissue biopsies

FEATURES/BENEFITS

· Cost effective

· Easily Scalable

· Light and temperature stable reagents

· More accurate than current methods of RNase activity assay

· Selective and specific detection method

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,041,201	06/22/2021	2015-626
United States Of America	Issued Patent	10,422,003	09/24/2019	2015-626

STATE OF DEVELOPMENT

Method has been developed and verified *in vitro* in a human cell line, *in vivo* in a transgenic mouse model and *ex vivo* in human serum

RELATED MATERIALS

▶ A general approach to high-yield biosynthesis of chimeric RNAs bearing various types of functional small RNAs for broad applications. - 04/20/2015

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INVENTORS

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OTHER INFORMATION

KEYWORDS

RNase, label-free, chimeric RNA, diagnosis, cancer, diseases

CATEGORIZED AS

- ▶ **Biotechnology**
  - ▶ Genomics
  - ▶ Health
  - ▶ Other
- ▶ **Imaging**
- ▶ **Materials & Chemicals**
  - ▶ Biological
- ▶ **Medical**
  - ▶ Diagnostics
  - ▶ Disease: Cancer
  - ▶ Gene Therapy
  - ▶ Imaging
  - ▶ Screening
- ▶ **Research Tools**
  - ▶ Cell Lines
  - ▶ Expression System
  - ▶ Nucleic Acids/DNA/RNA
  - ▶ Reagents
  - ▶ Screening Assays

- **Sensors & Instrumentation**
  - Biosensors
  - Scientific/Research
- **Veterinary**
  - Diagnostics
  - Other

RELATED CASES

2015-626-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Cost-effective Method to Quickly Produce and Purify Large Quantities of Biologically Active ncRNAs
- Bioengineered RNA Molecules for Cancer Therapy

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