Stable, Oxidation-Resistant Inhibitors for Reducing Ribonuclease Contamination

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing stable ribonuclease inhibitors for use in molecular biology experiments.

OVERVIEW

Ribonucleases are stable and highly active enzymes that degrade nucleic acids. As techniques for working with nucleic acids in the laboratory have become widespread, ribonuclease contamination has become a major problem. Even trace amounts of ribonuclease can rapidly degrade all of the mRNA in an experimental sample. And ribonucleases can be found almost everywhere, from tap water to imperfectly purified reagents to the hands of researchers.

Ribonuclease inhibitors provide one possible approach to avoiding ribonuclease contamination. However, commercially available inhibitors are susceptible to rapid, irreversible oxidation and are not very stable, making their use impractical.

THE INVENTION

A UW-Madison researcher has created mutant forms of ribonuclease inhibitors. These inhibitors are more resistant to oxidation and therefore more stable than commercially available inhibitors. They retain their specificity and affinity for ribonuclease.

Ribonuclease inhibitors may become unstable when cysteine residues are oxidized to form disulfide bridges. To prevent the formation of these unwanted disulfide bonds, the mutant inhibitors have another amino acid, preferably alanine, substituted for one or more adjacent cysteine residues in the wild-type inhibitor sequence.

APPLICATIONS

• Reducing ribonuclease contamination in molecular biology experiments
KEY BENEFITS

- More stable and requires less special handling than commercially available ribonuclease inhibitors
- Makes the use of ribonuclease inhibitors in biotechnology more practical
- May enable the use of ribonuclease inhibitors to reduce the angiogenin-mediated formation of new blood vessels

STAGE OF DEVELOPMENT

In laboratory tests, the mutant ribonuclease inhibitors were found to be 10- to 15-fold more resistant to oxidative damage than the wild-type human ribonuclease inhibitor.

ADDITIONAL INFORMATION

Publications

Tech Fields
Research Tools - DNA & RNA tools

CONTACT INFORMATION

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854.