

## UPDATE FROM THE CUTTING EDGE

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The abstracts of the recent research information appearing in Vol.9 No.7-9 of "AIST TODAY" are introduced here, classified by research area. For inquiry about the full article, please contact the author via e-mail.

Life Science and Biotechnology

### Development of a method for specific degradation of nuclear-localized RNAs with unknown functions Road to new medical and pharmaceutical researches originated from the emerging RNA functions

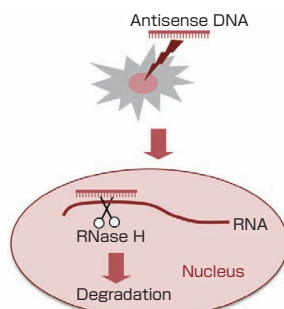
We have developed a new experimental system to specifically degrade nuclear-localized RNAs in mammalian cultured cells. The noncoding RNAs (ncRNAs), whose functions have largely remained elusive, are expected to be playing various critical roles in the cell nucleus and to be related to various diseases. Since the available method to degrade the specific RNAs was limited in those targets for cytoplasmic mRNAs, we attempted and succeeded in developing a system that could target for nuclear RNAs by employing antisense DNA oligonucleotides (ASO) that were efficiently administered into the nucleus by electroporation. The introduced ASO forms DNA-RNA heteroduplex with the target RNA, which is recognized by a cellular enzyme called RNaseH that specifically degrades the target RNAs. We have confirmed that more than 50 different nuclear ncRNAs could be degraded by our method and the phenotypic alterations were also observed. Therefore, our system opened a new window in the research field of ncRNAs, and it would eventually link to a new approach of pharmaceutical application.

**Tetsuro Hirose**

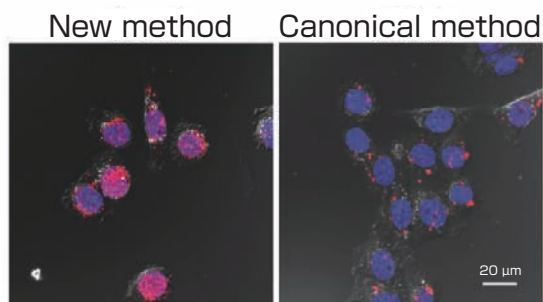
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The method for specific degradation of nuclear RNAs



Introduction of antisense DNAs (red signal) into the nucleus (blue signal)