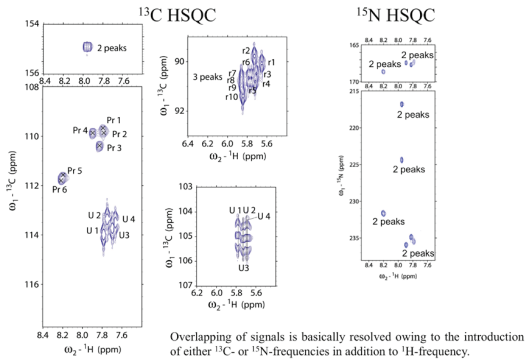
Example of RNA-Protein Interaction Studied by Multinuclear NMR

We are pleased to announce the addition of these stable isotope-labeled ribonucleoside 5′-triphosphates to our product offering. CIL, working in collaboration with Cassia, LLC, is able to present the four individual ribonucleotides, as well as a set of ATP, CTP, GTP and UTP.

"The detailed analyses by means of stable isotope-labeled RNAare provided on the interaction between Musashi protein which regulates the neural differentiation and its target RNA. It has been difficult to detect chemical shift changes for RNA bases upon complex formation, because base signals overlap each other and also with protein signals. This time, however, the introduction of stable isotope-labeled RNAs enables us to sensitively detect the RNA residues involved in the interaction with protein by utilizing either carbon or nitrogen frequency in addition to proton frequency."

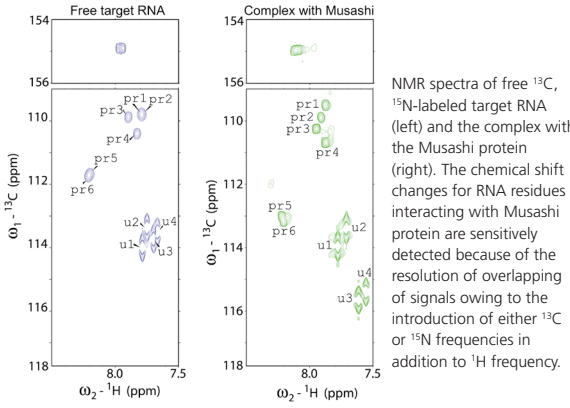
Professor Masato Katahira
Institute of Advanced Energy
Kyoto University

NMR spectra of ^{13}C-, ^{15}N-labeled target RNA: r(GGUAGUAGUU)



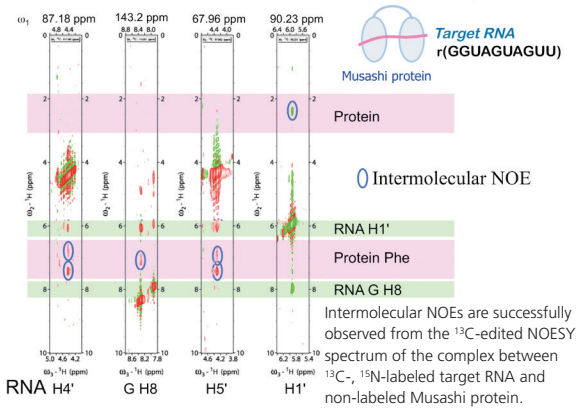
Overlapping of signals is basically resolved owing to the introduction of either ^{13}C- or ^{15}N-frequencies in addition to ^1H-frequency.

Identification of RNA residues interacting with Musashi protein



NMR spectra of free ^{13}C, ^{15}N-labeled target RNA (left) and the complex with the Musashi protein (right). The chemical shift changes for RNA residues interacting with Musashi protein are sensitively detected because of the resolution of overlapping of signals owing to the introduction of either ^{13}C or ^{15}N frequencies in addition to ^1H frequency.

Observation of intermolecular NOEs between RNA and Musashi protein



Intermolecular NOEs are successfully observed from the ^{13}C-edited NOESY spectrum of the complex between ^{13}C-, ^{15}N-labeled target RNA and non-labeled Musashi protein.

These data were provided by Dr. Takako Ohyama, Graduate School of Nanobioscience, Yokohama City University.