

Scientists discover new method for studying molecules

November 17 2010

Researchers at Queen's University have discovered the method for studying oxygen in large molecular systems. The findings will help in the study of proteins, DNA, RNA and other molecular structures.

Biological molecules make up all living creatures on earth and contain four major elements – hydrogen, carbon, nitrogen and oxygen. But until now scientists were only able to use nuclear magnetic resonance (NMR) to study three out of the four elements in the molecule puzzle because oxygen wavelengths were difficult to detect.

"Oxygen signals were so weak, so to speak, that no one could make use of them," says chemistry professor Gang Wu. "Now there is a way of detecting them even in complex biomolecular systems."

Dr. Wu and his colleagues used one of the strongest NMR spectrometers in the world, located at the National Ultrahigh-Field NMR Facility for Solids in Ottawa, to create a magnetic field in which oxygen's wavelength could be detected. They also enriched the oxygen in the molecule using isotope enrichment, and implemented new NMR techniques to boost the sensitivity for detecting weak signals.

The result is an amplified [oxygen](#) wavelength that can be studied. Scientists can now examine all four major elements and learn more about the chemical structure and interaction of large molecules.

Dr. Wu's colleagues include lead author and Queen's post-doctoral

fellow Jianfeng Zhu, Eric Ye (University of Ottawa) and Victor Terskikh (NRC Steacie Institute for Molecular Sciences).

More information: The findings were recently featured as a cover article in *Angewandte Chemie*

Provided by Queen's University

Citation: Scientists discover new method for studying molecules (2010, November 17) retrieved 26 April 2024 from <https://phys.org/news/2010-11-scientists-method-molecules.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.