



RESEARCH2REALITY

Shining a light on research & innovation.

Following the Molecular North Star

An interview with **Lewis Kay**, Biophysicist
University of Toronto

We're made up of molecules. We're looking at what it is about them that makes them special; what it is about them that makes them work when they work properly, and what it is about them that makes them malfunction in the course of, say, disease.

At a fundamental level you have to understand how those molecules are interacting with other molecules. And these molecules are not static entities. Just like if I take a picture of somebody, I get a static entity: I learn something about that person — what they look like, how big they are, perhaps — but I don't learn a lot about them.

So I really have to learn about the nuances of these molecules. And to do that we have to develop the technology which not only allows us to have a picture of these molecules, but to understand how they evolve in time in response to various stimuli, which can be other molecules. So what we really want to do is to develop the tool kit so we can manipulate these molecules in ways that will allow us to either increase their functionality, or if appropriate, also decrease their functionality, if they're too functional, if you like. And in some diseases that's what happens.

What is NMR?

So what is nuclear magnetic resonance spectroscopy, NMR, the thing that I spend most of my life doing? Basically, we have our molecules; our molecules are made up of little bar magnets. These little bar magnets can orient in a big

