The more you see: spectroscopy in molecular biophysics

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*The more you see, the more you want to see
The more you see, the more you know
The more you know, the more you see (Aldous Huxley)*

One of the great features of science is that it has an endless frontier. The farther you travel, the more you see over the emerging horizon. The more you discover, the more you understand what you've already seen, and the more you see ahead. A genuine scientist takes the time to look beyond the frontiers.

The field of molecule imaging and spectroscopy has grown exponentially in recent decades. Molecule detection and spectroscopy represent the ultimate level of sensitivity and have been a longstanding objective of analytical methods. Single-molecule spectroscopy provides direct information on the physical, chemical, and biological properties of molecules on a truly molecular basis. With recent advances in lasers, optics, detectors, computational power, and commercial availability of instruments, spectroscopy has become enormously popular in biological and medical research.

The contributed papers in this special issue are by Marcus's colleagues who have had, and continue to have, the privilege to work with him. Marcus's scientific interest has crossed many boundaries in molecular biophysics right into

the heart of biological spectroscopy. He has made a very significant contribution to molecular biophysics, in particular protein–lipid interactions. He has improved the techniques of ESR, NMR, and fluorescence spectroscopy. Marcus has always enjoyed the great opportunities offered by science to travel abroad and to work within the international science arena. This special issue covers a variety of fields of scientific research and well represents his wide range of interests. The topics selected also reflect the great potential of molecular biophysics and molecular spectroscopy to interpret essentials which are usually hidden to our senses.

Looking forward, it seems clear that the field of molecular biophysics represented so well by Marcus is actually understood as a much wider self-evolving field of research, and the authors contributing to this special issue illustrate this to a great extent in their contributions. Applications in medical diagnosis, drug design, nanotechnology, self-assembling systems, self-repairing systems, and molecular computers are just few. As we move frontiers in science we go ever deeper answering scientific questions and rephrasing them at a more fundamental level, and we do this with ever increasing pace. The impatience of modern science demands molecular details at the click of a computer button. To see is to believe. The phase space, however, is so huge that we may still have to wait long for a very powerful all-encompassing microscope which would pierce molecular details and give us a real-time journey in the molecular wonderland. There is, however, no doubt that what a microscope is to microbiology, molecular spectroscopy is to biophysics. At the moment molecular spectroscopy is by far the best method of choice we can think of to take a snapshot of the molecular buzz and to see the unseeable. The more you see, the more you know; and thereby, the more you know the more you see.

Occasion: published in honour of the contributions Marcus A. Hemminga has made to science and the scientific community during 40 years of research in molecular biophysics.

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