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Editing the Journal of Magnetic Resonance 1997–2010

1. Introduction

The Journal of Magnetic Resonance has been the premier journal for the field of magnetic resonance spectroscopy for the past fifty years. The field encompasses nuclear magnetic resonance (NMR) spectroscopy and electron spin resonance (ESR) spectroscopy, and gains much of its power and novelty from various combinations of the interactions of electrons and nuclei and experimental methods. Seemingly a narrowly focused specialty journal, in practice, the depth of our fundamental understanding of spin physics and the breadth of our ability to manipulate the spins in chemical and biochemical applications make the contents essential reading for many scientists. The three primary roles as reader, author, and editor have played major parts in my scientific career. The unified roles of editor and author during the period 1997–2010 are highlighted here, since I was Editor during these years and it was a highly productive period for my research program.

Remarkably, the Journal of Magnetic Resonance has had only three Editors during its existence. The Founding Editor was Wallace Brey, and the original publisher was Academic Press. During the early days a major part of the editing and reviewing was performed at the University of Florida with only essential publishing activities carried out in San Diego by Academic Press. I was named the second Editor at the time a number of Publishing changes were made, chief among them was a consolidation of activities in the San Diego offices of Academic Press. Partway through my term even bigger changes accompanied the purchase of the Journal by Elsevier with the Publishing activities moved to the Netherlands. The third Editor is Lucio Frydman who has continued to enhance the scientific quality and broaden the use of electronic publishing methods.

2. Editorial contributions to the Journal of Magnetic Resonance 1997–2010 (13 years)

The world of scientific publishing has changed enormously since 1997 when I started as Editor. The manuscripts were submitted as paper copies and distributed to the reviewer as such. The reviews were returned by mail. This was such a slow process that the utilization of express delivery services for Communications was regarded as a major advance. Electronic and web-based communication methods were integrated into the editorial process as they became available. The substantial size and resources of Elsevier played an important role in the rapid transition to electronic publishing.

There were some surprises associated with accepting the position of Editor of a journal produced by for-profit publishers coming from a background as an academic author and reviewer. Clearly, the success of the journal depended on its profitability and only indirectly on its ability to disseminate the newest and most exciting scientific findings in the field of magnetic resonance.

The changing landscape was vividly expressed in the suggestions that I received from the publishers. In the beginning of my tenure (ca 2000) the price charged to libraries for a subscription reflected how many linear feet of shelf space were occupied by the bound copies of a year's issues. The suggestion was to decrease the rigor of the reviewing and editorial decisions so that more papers were accepted, which would increase the total number of pages and the length of shelf space occupied by the bound Journal. The Editor and Associate Editors felt differently: with more rather than less rigorous reviewing, the Journal would become even more attractive to readers and authors and gain in prestige and value. In this situation the libraries could hardly disappoint their students and faculty by cutting back on the journal's subscription. By contrast, toward the end of my tenure (ca 2010) the Journal's perceived value was measured not by total number of accepted papers but rather by its Impact Factor. At that time the suggestion was made to try and glean those papers that would receive few or no citations within the time frame selected for calculation of the Impact Factor. Perhaps this would be loosely correlated with the favorability of the reviews. As In the beginning, the commercial publishing process did not focus on scientific excellence but rather on the factors of the day that would make the Journal attractive to librarians and others who selected where the increasingly limited budgets for publications would be allocated. I saw the pursuit of scientific excellence as the essential role of the Editor and Associate Editors, indeed the entire magnetic resonance community who participated in this endeavor as authors, readers, and reviewers.

3. Scientific contributions to the Journal of Magnetic Resonance 1997–2010 (13 years)

It is not a coincidence that the Journal of Magnetic Resonance is well-established as the premier journal in the field of magnetic resonance. The Editor plays a role in ensuring the continuity and further improvement of its scientific reputation. I was fortunate in being able to recruit and retain an exceptional group of experts in magnetic resonance as Associate Editors who, among other things, could fill in the gaps in my own expertise. As a result, submissions could be handled with a very high level of expertise

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regardless of the specific area or level of novelty and sophistication. As a group the Associate Editors brought expertise in such diverse areas as magnetic resonance theory, imaging, in vivo spectroscopy, solid-state NMR spectroscopy, solution NMR spectroscopy especially of biomolecules, magic angle spinning, dynamic nuclear polarization, NMR of quadrupolar nuclei, electron paramagnetic resonance, and many other areas to the Journal. The development of instrumentation, especially probes utilized in all of these experiments, as well as the seminal papers on the construction of very high field magnets have been published in the Journal.

My research and editorial activities were closely linked during the period that I was Editor of the Journal. My research encompasses two main areas, molecular biology and NMR spectroscopy. The overall goal is to overcome the most fundamental barriers to protein NMR spectroscopy, which are the broad resonance linewidths and low sensitivity associated with large slowly reorienting proteins and their complexes. This is an important area of research because the vast majority of biological functions are carried out in supramolecular assemblies that are amenable to neither diffraction nor magnetic resonance methods. Further, optimized, isotopically labeled samples must be prepared.

Nearly all functional complexes are chemically and structurally anisotropic. The ability to access the anisotropic nuclear spin interactions provides a unique advantage for oriented sample solid-state NMR spectroscopy. This has been our main area of spectroscopic development; it complements the choices of biological systems and the experimental approaches. During the period 1997–2010 we published 112 papers, of which 34 were in the Journal of Magnetic Resonance. This is typical of researchers in biological NMR where the Journal attracts the papers with the highest impact in magnetic resonance. This is illustrated in the list below, which is subdivided by area.

Most of our magnetic resonance papers are concerned with experimental methods of solid-state NMR spectroscopy where the anisotropic character of the operative nuclear spin interactions are directly represented in the spectra. Constant efforts were applied to the improvement of specialized probes for oriented sample solid-state NMR experiments. Complementary studies of proteins in solution also merited publication in the Journal. The broad scientific and biomedical applications of the results presented in what might appear to be narrowly focused spectroscopy papers by their titles are highlighted by the range of funding sources. Recent research has been supported by grants P41EB002031 and R35GM122501 from the National Institutes of Health. For the past twenty-five years our research has benefited from being integrated with the instrumentation and methods development at the Biomedical Technology Resource Center for NMR Molecular Imaging at the University of California, San Diego. In addition to the National Institutes of Health as the primary source of support, we have received support from thoe National Science Foundation, the Department of Energy, and the Environmental Protection Agency.

3.1. Experimental methods for solid-state NMR

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4. Prediction of future studies

The first fifty years of the Journal of Magnetic Resonance have been very fruitful. The many developments in the theory, experimental methods, and instrumentation of magnetic resonance have provided valuable results. More importantly, doors to a tremendous range of studies have been opened. By encompassing the range of samples suitable for solution NMR and solid-state NMR, many biological structures can be studied at atomic resolution. The hope for the future of biological NMR is that biological studies will entail spectroscopy of small molecules, macromolecules, such as proteins and nucleic acids, their assemblies in membranes, chromatin, and virus particles, the macromolecules and assemblies in cells, and the tissues and organs made up of the cells. In summary, the types of magnetic resonance studies currently reported in the Journal have the potential to advance our understanding of chemistry and biology in health and disease. Parallel studies of solid, liquid, and gas samples demonstrate the range of materials examinedy by the most powerful spectroscopic studies.

5. Summary

Serving as Editor of the Journal of Magnetic Resonance has been a highlight of my scientific career. I gained a thorough understanding of current magnetic resonance studies and exposure to emerging methods that are sure to lead to many new findings in the future.

Stanley J. Opella
Department of Chemistry and Biochemistry, Univerity of California, San Diego, La Jolla, CA 92093, United States
E-mail address: sopella@ucsd.edu
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