



Editorial

Vibrational Spectroscopy and Biospectroscopy: Celebrating the Scientific Legacy of Professor Henry H. Mantsch

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This Special Issue is dedicated to honoring the extraordinary scientific career and enduring impact of Professor Henry H. Mantsch, whose pioneering contributions have fundamentally shaped the fields of vibrational spectroscopy, biospectroscopy, and biomedical infrared imaging. Over several decades of sustained research excellence, Prof. Mantsch has exemplified the rare combination of intellectual originality, technical insight, and scientific leadership that transforms entire disciplines.

Prof. Mantsch's work helped to redefine the reach of vibrational spectroscopy. Early in his career, he made seminal contributions to the understanding of molecular structure through infrared spectroscopy, establishing rigorous methodological and conceptual frameworks that continue to underpin current research. Building from these foundations, he became one of the principal architects of biospectroscopy as we know it today. He championed the idea (now widely accepted) that infrared and Raman spectroscopies could serve not merely as analytical tools, but as powerful, information-rich probes of biological function, molecular dynamics, and disease processes.

His research group played a central role in the introduction and advancement of FT-IR spectroscopy in biomedical diagnostics, demonstrating how spectroscopic fingerprints of tissues and biofluids could reveal subtle biochemical alterations associated with disease progression. Through these advances, Prof. Mantsch helped establish biospectroscopy as a translational science, linking fundamental molecular phenomena with clinically meaningful outcomes. His work opened the door to spectroscopic pathology, metabolic and pharmacological monitoring, and non-invasive diagnostic strategies, concepts that continue to inspire innovation worldwide.

Beyond his achievements at the bench, Prof. Mantsch has been a remarkable builder of scientific communities. His leadership at the National Research Council of Canada fostered an environment of rigorous inquiry and creative exploration. He supported the development of young scientists, encouraged international collaboration, and consistently promoted the integration of spectroscopy across chemistry, biology, medicine, and materials science. Through keynote lectures, editorial leadership, and scientific society engagement, he helped define the identity and cohesion of the global vibrational spectroscopy community.

Prof. Mantsch's publication record, citation impact, and numerous honors reflect both the breadth and depth of his contributions. Yet perhaps equally important is the spirit with which he has pursued science: intellectually generous, collaborative, and visionary. His



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influence is felt not only in the literature and the laboratory, but also in the generations of scientists who have learned from his example.

This Special Issue brings together contributions that reflect the rich scientific terrain shaped by Prof. Mantsch's work. The articles span fundamental and applied aspects of vibrational spectroscopy, structural chemistry, biospectroscopy, and related theoretical and computational approaches, a testament to the interdisciplinary reach of his legacy.

It is both a pleasure and an honor to dedicate this issue to Professor Henry H. Mantsch, a scientist of exceptional insight, a leader of international stature, and an inspiring figure whose work continues to advance our understanding of molecular structure and biological systems. Henry passed away on 23 October 2024, and he leaves behind a legacy of scientific brilliance, mentorship, and unwavering dedication to his field. His memory will live on through the countless lives he touched and the enduring impact of his work. He will be deeply missed but forever cherished.

We warmly thank all contributors and readers who join us in celebrating his life's work and continuing influence on the future of spectroscopy.

The Guest Editors

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