

Roger W. Jeanloz: 1917–2007

Sen-itiroh Hakomori

Published online: 11 January 2008
© Springer Science + Business Media, LLC 2007



On September 12, 2007, Professor Roger W. Jeanloz passed away peacefully at the age of 89, while vacationing at their summer home in southern France with his wife Dorothea. This was shocking news for many scientists who had worked in his lab—some of us were making plans to celebrate his 90th birthday with a special dinner in Boston on November 14.

Professor Jeanloz was born November 3, 1917 in Berne, Switzerland. He was educated at the College of Geneva,

and then entered the University of Geneva, worked with Professor Kurt H. Meyer on glycogens and amylases, and received his Doctor of Science degree in 1943. Kurt H. Meyer is well known for his general concept on existence of covalently linked polymeric compounds.

After that, Roger was supported by a Swiss Foundation fellowship from 1943–1946, continued to study in Kurt H. Meyer's lab, and subsequently in the lab of Professor Tadeus Reichstein (University of Basel, 1944–1946), who was the world leader in corticoid pharmaceutical chemistry (he was awarded the Nobel Prize in 1951).

During 1946–1951, Roger was a postdoctoral research associate at the University of Montreal, and subsequently at the National Institute of Public Health in Bethesda, MD. He then joined the Worcester Foundation for Experimental Biology, Worcester, MA, USA where he served as senior member and head of the Laboratory of Biochemistry; at the same time, he was an associate at the Dept. of Physiology, Tufts Medical School, Boston, MA, USA. During this period, he was not only working on carbohydrate chemistry, but was also much involved in biochemical studies of various steroids, particularly corticosterone, which had received great attention in pharmaceutical chemistry.

In 1951, he was invited as a faculty member in the Dept. of Biological Chemistry, Harvard Medical School (HMS), and the Dept. of Medicine, Massachusetts General Hospital (MGH). Roger became Head of the Laboratory for Carbohydrate Research, Dept. of Medicine, MGH, in 1961, and Professor of Biological Chemistry and Molecular Pharmacology, HMS, in 1969. Thus, from the early 1950s to late 1980s (almost 40 years), he ran a highly productive carbohydrate research group at the first-class research center. In 1988, he became Professor Emeritus at HMS. Aside from teaching at HMS, he

S. Hakomori (✉)
Pacific Northwest Research Institute,
Seattle, WA 98122, USA
e-mail: hakomori@u.washington.edu

S. Hakomori
Department of Microbiology and Pathobiology,
University of Washington,
Seattle, WA 98122, USA

loved to mentor and entertain students from various cultural backgrounds; he served as advisor or tutor to undergraduate students at Harvard College, Faculty of Arts and Science, beginning in 1961 and continuing until June 2007.

During his long academic career, Roger conducted many outstanding studies on carbohydrate structure and application of organic synthesis to biochemical problems, including novel structural units of bacterial cell walls, mucopolysaccharides, and mucins of animal cells and tissues. His research had clinical implications for cancer, immune system disorders and diseases. He published over 500 papers (including meeting reports). Structural determination and synthesis of key carbohydrates having essential roles in cellular function are the central themes in Roger's work. This trend is somewhat different from, or more authentic than, current fashion of "glycobiology"—in which the functional significance of carbohydrates is much emphasized, and the exact structure involved is sometimes neglected.

In many cases, Roger tried to establish exact carbohydrate structure, including D- or L-antipode, pyranose or furanose, and α or β anomer. He also advised to utilize chemical synthesis in order to confirm the structures and their biological significance. For example, a famous series of studies from his lab on structure of GlcNAc-muramic acid-peptide complex as a major component of bacterial cell wall were initially made on natural disaccharides as GlcNAc β 1–6 muramic acid, *i.e.*, 2-amino-3-O-(D-1-carboxyethyl)-2-deoxy-D-glucose. Subsequently, absolute configuration of lactic acid side chain as D was determined. Finally, some muramic acid backbone was shown to contain D-mannose rather than D-glucose structure, although the majority was D-glucose backbone.

Another example is uronic acid structure of chondroitin sulfate B (dermatan sulfate), which was previously claimed as iduronic acid based on paper chromatography. However, D- or L-isomer status was not clear. Roger's group synthesized 1,2-*O*-isopropylidene-L-idofuranose from D-glucose (4-step reaction), and this was further converted to 1,6-anhydro- β -L-idopyranose. The uronic acid residue from dermatan sulfate was isolated and also converted to 1,6-anhydro- β -L-idopyranose. Uronic acid residue of dermatan sulfate was thus identified as L-isomer.

I am of course not intending to review here Roger's and his colleagues' many outstanding accomplishments. These are just two examples to illustrate their approach, which also applied to much of their other studies.

For his outstanding contributions in carbohydrate chemistry and biology, Roger received numerous awards and honors, including the Medal of the Societe de Biochimie of France (1960), Medal of the University of Liege, Belgium (1964), Prix Jaubert from the University of Geneva (1973), Hudson Prize from the American Chemical Society (1973), Guggenheim Fellowship Award (1976), Honorary Doctorate from the University of Paris (1980), and Distinguished U.S. Scientist Award from the Humboldt Foundation (1983).

Roger was devoted to encouraging close interaction between scientists in the fields of chemistry and biology of carbohydrates, on a national and international level. This is reflected by his many professional positions and visiting appointments, including: Senior Member, Worcester Foundation for Experimental Biology and Head of the Laboratory for Biochemistry, Worcester, MA, USA (1948–1951); Special Investigator of the Arthritis and Rheumatism Foundation (1957–1960); Guest Professor, Department of Physiological Chemistry, University of Cologne, Germany (1959–1960); Guest Professor, Department of Organic Chemistry, University of Freiburg, Germany (1960); U.S. State Department Lectureship in Poland (1965); Exchange Fellow, U.S. National Academy of Sciences/Academy of Science U.S.S.R. (1970); Guest Professor, University of Grenoble, France (1972); Visiting Professor, Universities of Tokyo and Kyoto, Japan (1976); Guggenheim Foundation Fellow, Visiting Professor, University of Geneva, Switzerland (1976–1977); and Elected Fellow, American Association for the Advancement of Science (1987).

In fact, Roger paid great effort to organize the first international meeting on glycoconjugates, held at Swampscott, MA, USA in summer 1964, with participants from the U.S., and also many from Europe and Japan. The number of participants at such international meetings has steadily increased as the meetings have become more popular among glycoscientists. I'm sure Roger played a key role in organizing and setting up these meetings in the early days.

I'm sure that my admiration for Roger and his many personal and professional accomplishments is shared by hundreds of carbohydrate chemists and glycoscientists worldwide. They will join me in offering sincere condolences and best wishes to Dorothea, and to Roger's children Claude, Danielle, Raymond, and Sylvie.