Christopher T. Walsh

Dr. Christopher T. Walsh was born on February 16, 1944. He completed his A. B. degree in Biology (1965) at Harvard University and his Ph.D. degree in Life Sciences (1970) at The Rockefeller University. From 1970–1972 Dr. Walsh was the Helen Hay Whitney Foundation Fellow in the Graduate Department of Biochemistry at Brandeis University.

In 1972 he became an Assistant Professor of Chemistry and Biology at Massachusetts Institute of Technology (M.I.T.). Dr. Walsh was promoted to Associate Professor in 1976 and Professor in 1978. In 1982 he became Chairman of the Department of Chemistry at M.I.T. and in 1985 he was named the Karl Taylor Compton Professor.

During Dr. Walsh's distinguished career, he has received numerous honors and awards including the Eli Lilly Award in Biochemistry (1979), a Alfred P. Sloan Foundation Fellowship (1975–1977) and a Camille & Henry Dreyfus Teacher-Scholar Grant (1976–1980). Dr. Walsh has delivered numerous plenary and invited lectures and he holds memberships in many societies and professional organizations.

Professor Walsh's research interests center around bio-organic chemistry, biochemistry, medicinal chemistry, and molecular toxicology. He and his research group have authored 180 research publications in these areas, analyzing the patterns of catalysis in biological systems.

The major focus is on the study of enzymes, the macromolecular protein catalysts responsible for controlled chemical changes in living organisms. Most of the transformations undergone by specific molecules in biological systems can be collected into a small number of chemical reaction types. With a feeling for the underlying pattern of the way common functional groups are enzymatically processed, one can see the chemical logic of metabolic sequences and interconversions. This is the organizing principle in Professor Walsh's research and is exemplified in his authoritative text book, *Enzymatic Reaction Mechanism*, published in 1979.

Professor Walsh has extensively investigated the chemical mechanisms by which vitamins such as B_6 (pyridoxal) and B_2 (riboflavin) serve as required cofactors in physiologically and pharmalogically important enzymic processes. These works have helped define the underlying strategies organisms use in conducting oxidation-reduction reactions essential for energy generation from ingested food stuffs. They have also led to a major effort in unraveling the biological generation of natural gas (methane) from CO_2 and H_2 by anaerobic bacteria. Professor Walsh has pioneered in the design and synthesis of a new class of enzyme inhibitors termed suicide substrates or Trojan House reagents. This has involved successful studies in the area of antibacterial agents, anticonvulsive agents, plant growth regulators, and antitumor drugs.

In the area of molecular toxicology, Professor Walsh's group has analyzed the general question of how safely and efficiently do organisms deal with toxins and precarcinogens and in a chemical sense how to defuse enzymic intermediates that are chemically "too hot to handle." This involves research on the action of liver oxygenative enzymes on polycyclic hydrocarbon activation, on detoxification and hepatotoxic barbiturates such as seconal, and more recently on the biodegradation both of organomercurials by reductive cleavage of carbon-mercury bonds and of inorganic mercury salts to elemental mercury.