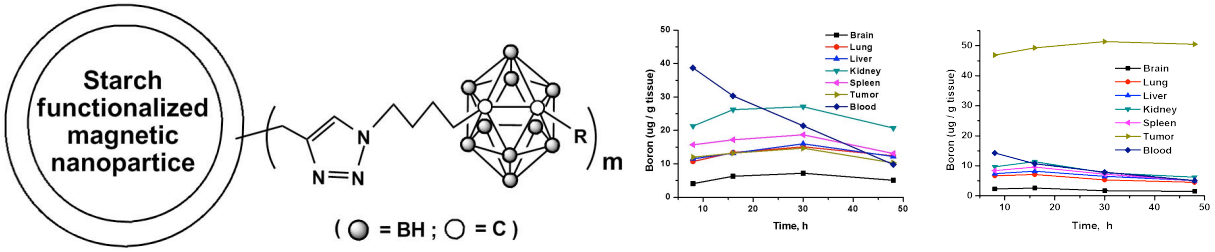
Dendritic and Nanostructured Boron and Carbon Compounds for Cancer Therapy

Narayan S. Hosmane

Abstract

In recent years, much efforts have been devoted to developing nanomaterials-based boron drugs for neutron capture therapy (NCT) and to date, a majority of the studies have proved reasonably promising. Conversely, further *in vivo* studies and clinical trails are needed to establish them as appropriate boron carriers; this is especially so with the relatively novel boron and carbon nanotubes and magnetic nanoparticles. More advanced forms of boron nanotubes can be anticipated as much interest in their synthesis as their future applications. Thus, boron neutron capture therapy (BNCT) is a promising treatment for malignant brain tumors as well as for other types of cancers, such as, liver, prostate, bladder, breasts, head and neck tumors. Current research focuses on both the design and synthesis of high boron containing compounds as BNCT agents, and the search for suitable delivery vehicles. To be suitable BNCT agents, the problem of their low water-solubility needs to be resolved by chemical modification. In the case of magnetic nanoparticles, strategies are required to counter their tendency of embolization and their unclear cytotoxicity must be resolved.



Synthesis and Biodistribution of Carborane-Appended Magnetic Nanocomposites Without (a) and With (b)External Magnet (1.14 Tesla)

Zhu, Y.; Koh, C. Y.; Maguire, J. A.; Hosmane, N. S.; Recent developments in the Boron Neutron Capture therapy (BNCT) driven by nanotechnology. *Cur. Chem. Biol*. **2007**, *1*, 141.

Biography

Narayan S. Hosmane was born in Gokarn, Karnatak state, Southern India, and is a B.S. and MS graduate of Karnatak University, India. He obtained a Ph.D. degree in Inorganic Chemistry in 1974 from the University of Edinburgh, Scotland, under the supervision of Professor Evelyn Ebsworth. After a brief postdoctoral research training in Professor Frank Glockling's laboratory at the Queen's University of Belfast, he joined the Lambeg Research Institute in Northern Ireland, and then moved to the USA to study carboranes and metallacarboranes. After postdoctoral work with Russell Grimes at the University of Virginia, in 1979 he joined the faculty at the Virginia Polytechnic Institute and State University. In 1982 he joined the faculty at the Southern Methodist University, where he became Professor of Chemistry in 1989. In 1998 he moved to Northern Illinois University and is currently a Distinguished Research Professor and Inaugural Board of Trustees Professor. Dr. Hosmane is widely acknowledged to have an international reputation as “one of the world leaders in an interesting, important, and very active area of boron chemistry that is related to Cancer Research” and as “one of the most influential boron chemists practicing today.” Hosmane has received numerous international awards that include but are not limited to the Alexander von Humboldt Foundation’s Senior U.S. Scientist Award twice; the BUSA Award for Distinguished Achievements in Boron Science; the Pandit Jawaharlal Nehru Distinguished Chair of Chemistry at the University of Hyderabad, India; the Gauss Professorship of the Göttingen Academy of Sciences in Germany, Visiting Professor of the Chinese Academy of Sciences for International Senior Scientists; High-End Foreign Expert of SAFEA of China; and Foreign Member of the Russian Academy of Natural Sciences. He has published over 320 papers in leading scientific journals and an author of five books on boron science and cancer therapies.

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