Masao Takagaki et al., Organic Chem Curr Res 2017, 6:2 (Suppl)
DOI: 10.4172/2161-0401-C1-019

Concept of malignancy of brain tumors for drug design of Boron Neutron Capture Therapy

Masao Takagaki[1], **Katzuko Uno**[1] and **Narayan S Hosmane**[2]
[1]Kyoto University, Japan
[2]NIU, USA

Boron Neutron Capture Therapy (BNCT) is a radiotherapy which combines biological targeting and high LET radiation. This type of therapy consists of the enrichment of tumors with ^{10}B, and the successive irradiation of the target with low energy neutrons. This produces heavy ionizing particles that cause non-repairable damage to the cells. If ^{10}B accumulates selectively in the tumor cells, high Linear Energy Transfer (LET) radiation and tumor-selective radiation will not cause serious damage to the surrounding normal tissues. Previous phase-I studies shows that BNCT might be effective and safe in patients with inoperable, locally-advanced malignant glioma and head and neck cancers, even those that recur at previously irradiated sites. However, despite extensive efforts for over half century, it is difficult to ensure that the selective targeting of ^{10}B will be successful. One can argue whether Locher's BNCT theory published in 1936 is feasible? We talk about the uncertainty and selectivity of boron targeting for malignant brain tumors (gliomas) and we presented about biological aspects for understanding of malignancy and intracranial tumor cells infiltration for organic and inorganic boron chemistry for BNCT targeting. From the viewpoint of boron chemistry, the conditions required for boron targeting are: (1) a low toxicity, (2) the ability to be held in a tumor and/or tumor cells selectively for a certain period of time, (3) to be rapidly excreted from the body system. These points are essential, but to achieve each of these at the same time is a very difficult task. Furthermore, we shortly discuss about the potential future problems of BNCT by reviewing an extensive number of recently published articles and author's works regarding boron targeting for BNCT.

Biography

Masao Takagaki has studied many subjects like Physics, Medicine, and Anthropology in Kyoto University. Currently, she is a Japanese Neurosurgeon who is investing Boron Neutron Capture Therapy for malignant brain tumors for more than 40 years. She has invested new boron/Gd compounds co-operating with many American Researchers.

takagaki.masao@louis-pasteur.or.jp

Notes: