**Reference Title (and citation)**

**Boron neutron capture therapy demonstrated in mice bearing WMT6 tumors following selective delivery of boron by rationally designed liposomes**

Peter J. Kueffer et al., PNAS Early Edition. 2013 16;110(16):6512-7.

**Importance**

BNCT is a binary treatment modality for cancer involving the selective accumulation of chemical agent containing the isotope 10B in cancer cells followed by irradiation with thermal neutron. Capture of a thermal neutron by 10B nucleus initiated nuclear reaction in which decay of an excited 11B nucleus produces a high linear energy transfer α-particle and lithium nucleus.

**Outstanding problems**

Because of these short trajectory of these heavy particles, radiation damage is limited to those cells containing 10B.Thus, if 10B agent can be selectively targeted to tumor cells, side effects typically associated with ionizing radiation can be avoid.

**Experimental approaches (or engineering solution)**

In this study, the authors doing the biodistribution studies and irradiation studies of the MAC and TAC by using EMT6 injected BALB/c mice.

In biodistribution studies, after injection of the drug, brain, lung, heart, liver, kidney, spleen, tumor, blood and tail sample were harvested and stored at each time point. Tissue were digested by using Microwave Accelerated Reaction System and boron content was determined via ICP-OES.

**Critical findings/Results/Summary**

The authors first set up the double-injection protocol, and the 54-h time point was chosen as the most optimal for irradiation. Then, the authors proof that delivery of therapeutic quantities of boron to tumor via liposomes carry polyhedral boranes and carboranes can successfully suppression of tumor growth by BNCT.

**Significance (of this research finding)**

Boron rich liposome can successfully been selective delivery to tumor cells and can suppress the tumor growth by BNCT treatment.