

# BIOPHARMA & BIOTHERAPEUTICS

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## Synthesis of borono-fluoro-deoxy-D-glucose as boron carrier for Boron Neutron Capture Therapy (BNCT)

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**Objective:** The  $^{18}\text{F}$ -labeled Deoxy-D-Glucose exhibits high affinity to cancer tissue as a PET (Positron Emission Tomography) imaging agent for metastatic cancers. Complexation of  $^{10}\text{B}$  to  $^{18}\text{F}$ -DG complex may create a useful BNCT (Boron Neutron Capture Therapy) agent for cancer therapy. In previous studies, complexation and characterization of  $^{10}\text{B}$  with DG was evaluated and bio distribution analysis was completed successfully. Radio labelled  $^{10}\text{B}$ -DG will be useful approach for uses for BNCT applications.

**Methods:** The  $^{18}\text{F}$ -DG synthesized by ion exchange and complexed with  $^{10}\text{B}(\text{OH})_3$  via pH reactions.  $^{18}\text{F}$ -DG- $^{10}\text{B}$  complexation was assayed with Agilent 1260 Infinity HPLC-

DAD and Agilent 6420 Triple Quad LC/MS. Complexed molecule defragmented and fragmentation products assayed with Agilent 6420 Triple Quad LC/MS for confirmation.

**Results:**  $^{10}\text{B}$ - $^{18}\text{F}$ -DG complex was obtained with ion-exchange pH reaction successfully. Complexation of two  $^{10}\text{B}(\text{OH})_3$  to  $^{18}\text{F}$ -DG was determined with Triple Quad LC/MS. Purification of  $^{10}\text{B}$ - $^{18}\text{F}$ -DG is currently in progress.

**Conclusions:** Radio-labelled  $^{10}\text{B}$  will supply new insight to research for BNCT studies. Cancer detection and therapy will be applicable in same schedule with  $^{10}\text{B}$ - $^{18}\text{F}$ -DG complex

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