

activity-images. In the case of head and neck treatment, the activity distribution changed in the areas where partial tumor reduction was observed. In the case of liver treatment, it was observed that the washout effect in necrotic tumor cells was slower than in non necrotic tumor cells.

**Conclusion:** The BOLPs-RGp was developed for the DGPT. The accuracy of proton treatment was evaluated by measuring changes of daily measured activity. Information about the positron-emitting nuclei generated during proton irradiation can be used as a basis for ensuring the high accuracy of irradiation in proton treatment.

**Keywords:** dose-volume delivery guided proton therapy (DGPT), beam ON-LINE PET system on rotating gantry port (BOLPs-RGp), target nuclear fragment reaction

