

FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Systematic study of infrared photon emitting scintillators for cancer therapy

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1. Background of research

Radiation therapy for cancer which reduces the physical strains of patients is important. Especially, in developed country like Japan, as we are in the rapid aging-society, this should be seriously considered. It was a problem for traditional radiation therapy that the irradiation dose can't be accurately measured. In this work, novel near-infrared emitting scintillator, which allow us to measure the doze. The near-infrared light is not absorbed and harmless to human .

2. Research objectives

The spherical near-infrared photon emitting scintillators will be developed. The target properties are the scintillator, which emit near-infrared radiation which penetrates the 20-cm thick body corresponding to the fat thickness (125 cm). High light yield, which is capable to be detected outside the body, is required. The size of them are several millimeter for catheterization.

3. Research characteristics (incl. originality and creativity)

The research for the real-time dosimeter with near-infrared scintillators is the novel approach, which has never tried in the world. The study on near-infrared scintillators itself is also novel topic. In the previous R&D, they were planning to use glass fiber or cm scale dosimeter, which will give serious strains to the patient's body. On the other hand, our method is wireless and mm scale, therefore, less strain than these methods. I hope it will contributed to the innovation of radiation therapy.

4. Anticipated effects and future applications of research

When the real-time dosimeter will be developed, the accumulation of clinical data will be collected through the collaboration with the specialist on cancer therapy. The system should be prepared for the typical Japanese body shapes and tumor types in the nearest future.