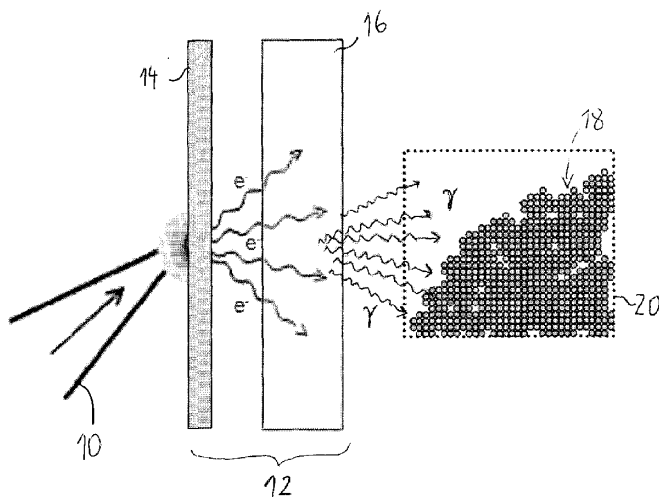


## Activation and production of radiolabeled particles

### Description

This invention relates to the activation and production of radiolabeled particles for internal radiopharmaceutical use: internal radiation therapy and nuclear medical imaging. Most of the existing methods to produce radiolabeled particles require activation by neutron bombardment, which can only be done in a nuclear reactor. The invention proposes to circumnavigate this important drawback by using a high-intensity laser beam on a converter to produce an irradiating field where nuclide precursors can be activated. The use of a tabletop-laser beam for activating particles such as micro-spheres and nano-particles proves extremely advantageous in terms of cost, size, logistics, operation



and maintenance. Tabletop-lasers are very compact and particularly adapted for installation in hospitals.

The irradiating field can either be a bremsstrahlung field produced via a solid converter such as a metallic foil, or a proton field with carbon and hydrogen containing material as converter.

One important advantage of the method is that it allows the production radiolabeled particles emitting both  $\beta^+$  and  $\beta^-$  radiations, which can thereby be used at the same time for therapeutically and imaging purpose. The production of both  $\beta^+$  and  $\beta^-$  emitting particles was not possible with conventional production methods using neutron bombardment.

### Innovative aspects and main advantages

- > Production of radiolabeled particles for treatment and/or medical imaging in hospitals
- > Limited operation, logistic, and maintenance costs
- > Production of  $\beta^+$  and  $\beta^-$  emitting radiolabeled particles
- > Just-in-time and in-house production of radiolabeled particles

### Areas of application

- > X-Ray diffractometry Medical Imaging
- > Therapeutic treatment by radiation
- > Hospitals

### Stages of development

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Patent pending AU2004216486  
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Prototype  
Pilot tests are being performed

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