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tissues (H) in healthy patients. Kruskal-Wallis test with multiple comparison correction and Cohen's d test were performed. A k-means clustering was computed on each ROI to estimate different diffusive compartments in tissues. The mean K and D and their variances were calculated on each cluster. K was higher in PT and T than in H, especially in G1 tumors, reflecting the tumoral tissues' complexity. D was higher in H than in T, due to the increased cell density in EC. Clusters showed great variabilities in K variance in T and PT. In conclusion, K reflects specific characteristics of tumoral tissues that could optimize the diagnosis and prognosis of EC.

Optimization of the production of ^{152,155,161}Tb with ^{nat}Dy(p,x) and ^{159}Tb(p,x) nuclear reactions.

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Some of the terbium radioisotopes have recently been proposed in nuclear medicine due to their characteristics: ^{149}Tb is an alpha and beta$^+$ emitter making it a candidate for radiotherapy and PET, ^{152}Tb is a multiple beta$^+$ emitter, therefore a candidate for PET, ^{155}Tb is promising for SPECT due to its gamma emissions, and ^{161}Tb emits both beta- particles and Auger electrons that can be used for Auger therapy. We studied the possibility to produce high specific activity ^{155}Tb after the decay of ^{155}Dy produced via ^{nat}Dy(p,x) and ^{159}Tb(p,x) reactions. Moreover, the possibility to produce ^{152}Tb and ^{161}Tb with ^{nat}Dy(p,x) reactions was investigated. The targets were irradiated at the GIP ARRONAX cyclotron (Saint-Herblain, FR) using the stacked foils technique with a proton beam of energy between 35 and 65 MeV. The measurement of the activity was done at LASA Laboratory (Segrate, IT) using high-resolution gamma spectrometry. We present the measured cross-sections in comparison with previous experimental results present in literature and theoretical simulations. Furthermore, thick target yield and radionuclide purity were computed to determine the feasibility of the production process.

Exploiting alpha particle induced reaction to produce terbium theranostic radioisotopes: cross-section determination up to 70 MeV.

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Most of the radionuclides used in nuclear medicine are produced via reactions induced by neutrons in nuclear reactors or by light charged particles (p or d). The use of α particles only finds limited applications due to two principal drawbacks: a lower production yield because of their short range in the target, and the limited availability of α particles beams accelerators. However, their use brings advantages including the easier radiochemical separation of the product, the atomic number of which can be two units higher than the target material. This is particularly true for radiolanthanides, the radiochemical separation of which is difficult. In this work we discuss the possibility to produce the theranostic terbium radioisotopes using

alpha particle induced reactions on natural gadolinium targets and natural europium (III) oxide targets. The cross-sections have been determined using the stacked-foils technique and compared with theoretical simulations and with previous studies, when available. The energetic range up to 70 MeV allows to produce the Tb radioisotopes that are farther from the valley of stability in the nuclide chart, like ^{149}Tb and ^{152}Tb.
