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## Generator-produced Alpha-emitters

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This review briefly describes the nuclear characteristics and production parameters for 7.2-h  $^{211}\text{At}$ , 60.6-min  $^{212}\text{Bi}$ , 45.6-min  $^{213}\text{Bi}$ , 11-d  $^{233}\text{Ra}$ , and 20-h  $^{255}\text{Fm}$ . These  $\alpha$ -emitting radioisotopes are the subject of current interest for  $\alpha$ -particle-mediated radioimmunotherapy.

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### Introduction

Alpha particles are of considerable interest for radioimmunotherapy applications. Due to their short range in tissue (a few cell diameters), and high linear-energy-transfer (LET),  $\alpha$ - particles are especially suited for targeting micrometastases and single tumor cells such as leukemia and other blood-borne diseases (Bloomer *et al.*, 1984, Ruegg, *et al.*, 1990, Huneke, *et al.*, 1992, Junghans, *et al.*, 1993, Hartmann, *et al.*, 1994, Kennel and Mirzadeh, 1997, Scheinberg, 1997). The list of potential radionuclides for these applications includes only five  $\alpha$ -emitting radioisotopes, namely  $^{211}\text{At}$  ( $t_{1/2} = 7.2$  h),  $^{212}\text{Bi}$  ( $t_{1/2} = 60.6$  m),  $^{213}\text{Bi}$  ( $t_{1/2} = 45.6$  m),  $^{233}\text{Ra}$  ( $t_{1/2} = 11$  d), and  $^{255}\text{Fm}$  ( $t_{1/2} = 20$  h). A list of the generator-produced  $\alpha$ -emitters and the corresponding references are given in

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