## <sup>68</sup>Ga-PET: a powerful generator-based alternative to cyclotron-based PET radiopharmaceuticals

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PET (positron emission tomography) is a powerful diagnostic and imaging technique which requires short-lived positron emitting isotopes. The most commonly used are accelerator-produced <sup>11</sup>C and <sup>18</sup>F. An alternative is the use of metallic positron emitters. Among them 68Ga deserves special attention because of its availability from long-lived 68Ge/68Ga generator systems which render <sup>68</sup>Ga radiopharmacy independent of an onsite cyclotron. The coordination chemistry of Ga<sup>3+</sup> is dominated by its hard acid character. A variety of mono- and bifunctional chelators have been developed which allow the formation of stable <sup>68</sup> Ga<sup>3+</sup> complexes and convenient coupling to biomolecules. <sup>68</sup>Ga coupling to small biomolecules is potentially an alternative to <sup>18</sup>F- and <sup>11</sup>C-based radiopharmacy. In particular, peptides targeting G-protein coupled receptors overexpressed on human tumour cells have shown preclinically and clinically high and specific tumour uptake. Kit-formulated precursors along with the generator may be provided, similar to the <sup>99</sup>Mo/<sup>99m</sup>Tc-based radiopharmacy, still the mainstay of nuclear medicine.

Keywords: gallium-68; generator; nuclear probes; PET

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