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Synthesis of new ^{18}F -labelled Porphyrins and their potential application for in vivo Molecular Imaging with PET

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Molecular imaging holds the promise of non-invasive assessment for biological and biochemical processes in living subjects using specific imaging tracers. Positron Emission Tomography (PET) is a highly specific and sensitive molecular imaging technique with widespread use for research and clinical application. The majority of PET studies today are performed with molecules labelled with fluorine-18, a radionuclide possessing important characteristics including a favourable half-life (110 min) and the ability to replace H in organic molecules.¹

It's widely recognised that porphyrins are one of the most important prosthetic groups in biological systems and porphyrin derivatives have recently found promising biomedical applications in detection and treatment of a variety of tumours due to their affinities for these tissues in relation with the nature of the side chain and the mechanism of their physico-chemical action.²⁻⁵ In this communication we describe our recent studies on the synthesis of novel sulfonamide substituted meso-tetraphenylporphyrins and automated synthesis of new ^{18}F -labelled porphyrin derivatives, by fluorination via nucleophilic substitution with $\text{K}_2\text{CO}_3/\text{K}_2.2.2/\text{ACN}$. Preliminary biodistribution studies in rats with PET will be presented. We believe our results may open new directions for the development of new theragnostic tools.

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References

- 1 William K. Hagmann, *Journal of Medicinal Chemistry*, 15, 2008, 4359; (b) Didier Le Bars, *Journal of Fluorine Chemistry*, 127, 2006, 1488.
- [2] Dabrowski et al., *ChemMedChem*, 2011, 6, 1715
- [3] M. M. M Pereira, C. J. P Monteiro, A. V. C. Simões; et al., *J. Porphyrins Phthalocyanines* 13, 2009, 567.
- [4] Dabrowski et al., *Med. Chem. Commun.*, 3, 2012, 502.
- [5] Pereira, M. M.; Monteiro, C. J. P.; Simoes, A. V. C.; et al., *Tetrahedron*, 66, 2010, 9545.

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