(*R*)-NEBIFQUINIDE: Development of a promising new PET tracer for TSPO imaging

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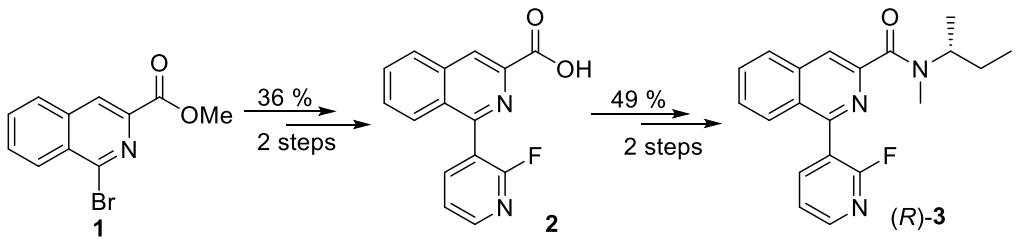
Overexpression of TSPO (translocator protein) was found to be associated with a variety of neuro-inflammatory diseases such as ALDS, Paget's and Parkinson's disease. Visualising these altered TSPO expression levels by PET imaging is a tool for early stage diagnosis of the mentioned pathologies. Nevertheless, all established TSPO PET ligands suffer from severe drawbacks such as high unselective binding or a high sensitivity towards the *rs6971* polymorphism.[1]



Scheme 1. Synthetic strategy towards (*R*)-NEBIFQUINIDE [(*R*)-**3**].

Here we present the chemical synthesis of enantiopure (*R*)-NEBIFQUINIDE, a potential new candidate for PET assisted TSPO imaging. The target molecule was obtained in 48 % yield over six steps including a Suzuki reaction, subsequent hydrolysis of the methyl ester, followed by amidation and final methylation under basic conditions. First *in vitro* and *in vivo* evaluations of (*R*)-**3** showed very promising results.[2] Thus we suggest (*R*)-**3** for further evaluation in animal models and clinical trials.

[1] C. J. D. Austin, J. Kahlert *et al, Int. J. Biochem. Cell Biol.* **2013**, *45*, 1212.

[2] N. Berroterán-Infante, T. Kalina *et al, Eur. J. Med. Chem.* **2019**, *176*, 410.