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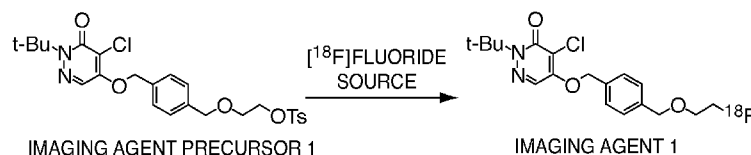


Fig. 1

(57) Abstract: The present invention generally relates to methods and system for the synthesis of imaging agents, and precursors thereof. The methods may exhibit improved yields and may allow for the large-scale synthesis of imaging agents, including imaging agents comprising a radioisotope (e.g., ^{18}F). Various embodiments of the invention may be useful as sensors, diagnostic tools, and the like. In some cases, methods for evaluating perfusion, including myocardial perfusion, are provided. Synthetic methods of the invention have also been incorporated into an automated synthesis unit to prepare and purify imaging agents that comprise a radioisotope. In some embodiments, the present invention provides a novel methods and systems comprising imaging agent 1, including methods of imaging in a subject comprising administering a composition comprising imaging agent 1 to a subject by injection, infusion, or any other known method, and imaging the area of the subject wherein the event of interest is located.