Late-Stage Fluorination

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fluorination, PET, fluorine

Abstract Speech

The unnatural isotope fluorine–18 (^{18}F) is used as a positron emitter in molecular imaging. Currently, many potentially useful ^{18}F-labeled probe molecules are inaccessible for imaging, because no fluorination chemistry is available to make them. Syntheses must be rapid on account of the 110-minute half-life of ^{18}F and benefit from using [^{18}F]fluoride due to practical access and suitable isotope enrichment. But [^{18}F]fluoride chemistry has been limited to nucleophilic fluorination reactions. I will describe the development of a palladium-based electrophilic fluorination reagent derived from fluoride and its application to the synthesis of aromatic ^{18}F-labeled molecules via late-stage fluorination. In addition, I will discuss new reaction chemistry for introduction of fluorine into functionalized molecules. Late-stage fluorination enables the synthesis of conventionally unavailable positron emission tomography (PET) tracers for anticipated applications in pharmaceutical development as well as pre-clinical and clinical PET imaging.

REFERENCES

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