**Category**

**Metal-Mediated Synthesis**

**Key words**

**copper**

**[$^{18}$F]trifluoro-methylation**

**aryl iodides**

**heteroaryl iodides**

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A Broadly Applicable [$^{18}$F]Trifluoromethylation of Aryl Iodides and Heteroaryl Iodides for PET Imaging

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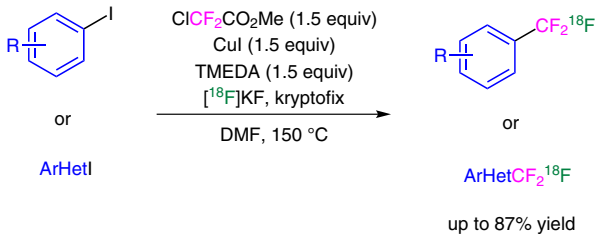
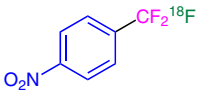
# [$^{18}$F]Trifluoromethylation of Aryl and Heteroaryl Iodides



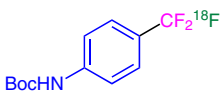

R = $NO_2$, $CO_2Et$, CHO, Ac, $CO_2H$, CN, Br, Ph, OAc, OPiv, OH, OBn, OMe, $CONH_2$, $NH_2$, NHC(O)Me, NHBoc, chiral dipeptide, chiral carbohydrate

HetAr = pyridyl, pyrazyl, quinolyl, benzothiazolyl, thienyl, uracilyl and indolyl derivatives

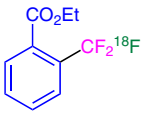
**Selected examples:**



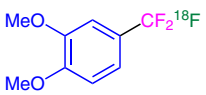

87% yield



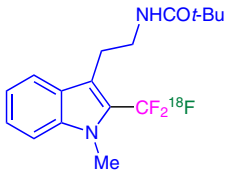

45% yield



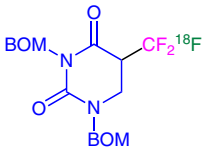

80% yield



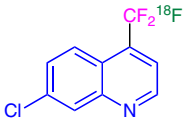

55% yield



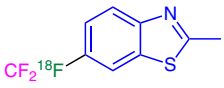

19% yield (obtained by C–H functonalization)




45% yield




38% yield




40% yield

**Significance:** The authors disclose the easy and broadly applicable late-stage [$^{18}$F]trifluoromethylation of various aryl and heteroaryl iodides using methyl chlorodifluoroacetate, CuI, TMEDA, and [$^{18}$F]fluoride. The [$^{18}$F]trifluoromethylated (hetero)aryls, which serve as [$^{18}$F]-PET (positron emission tomography) tracers, are obtained in good yields.

**Comment:** Usually, access to [$^{18}$F]-labelled probes is limited by the short half-life of $^{18}$F and the small availability of parent $^{18}$F sources that show a suitable reactivity, such as [$^{18}$F]$F^-$ and [$^{18}$F]$F_2$. Furthermore, this operational simple [$^{18}$F]$CuCF_3$-based strategy excludes the tedious preparation of complex organometallic precursors and may be performed on air. The active [$^{18}$F]$CF_3Cu$ is generated in situ.

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