

SUPPLEMENTARY DATA

Evaluation of Organo[¹⁸F]fluorosilicon Tetrazine as a Prosthetic Group for Synthesis of PET Radiotracers

Sofia Otaru[†], Surachet Imlimthan[†], Mirkka Sarparanta[†],

Kerttuli Helariutta[†], Kristiina Wähälä^{†,§}, Anu J. Airaksinen^{†,□,}*

[†]Department of Chemistry, Radiochemistry, University of Helsinki, Finland

[§]Department of Biochemistry and Developmental Biology, Faculty of Medicine, University of Helsinki, Finland

[□]Present address: Turku PET Centre, Department of Chemistry, University of Turku, Finland

*Corresponding author: Anu J. Airaksinen

Department of Chemistry, Radiochemistry, P.O. Box 55, FI-00014 University of Helsinki, Finland.
E-mail: anu.airaksinen@helsinki.fi. Present address: Turku PET Centre, University of Turku,
Kiinamylynkatu 4-8, FI-20520 Turku

Table of contents

Figure S1 ¹ H-NMR of compound 3	1
Figure S2 ¹³ C-NMR of compound 3	2
Figure S3 ¹ H-NMR of SiFA-Tz (6)	3
Figure S4 ¹⁹ F-NMR of SiFA-Tz (6)	4
Figure S5 ¹³ C-NMR of SiFA-Tz (6)	5
Figure S6 HPLC of [¹⁸ F]SiFA ([¹⁸ F]5)	6
Figure S7 HPLC of oxime formation (two-step method) for [¹⁸ F]SiFA-Tz ([¹⁸ F]6) (crude).....	7
Figure S8 HPLC (radio- and PDA -detectors) of formulated [¹⁸ F]SiFA-Tz ([¹⁸ F]6)	8
Figure S9 Autoradiography TLC-profile of purified [¹⁸ F]SiFA-Tz ([¹⁸ F]6).....	9
Figure S10 HPLC of [¹⁸ F]SiFA-Tz ([¹⁸ F]6) stability in 1xPBS (90 min)	10
Figure S11 HPLC of purified [¹⁸ F]fluoroalbumin ([¹⁸ F]10).....	11
Figure S12 Autoradiography TLC-profile of purified [¹⁸ F]fluoroalbumin ([¹⁸ F]10)	11
Figure S13 Biodistribution of [¹⁸ F]SiFA-Tz ([¹⁸ F]6).....	12
Figure S14 Biodistribution of [¹⁸ F]fluoroalbumin ([¹⁸ F]10)	13
Figure S15 Radio-TLC profile of [¹⁸ F]SiFA-Tz ([¹⁸ F]6) in human plasma stability studies	14
Figure S16 Radio-HPLC profile of [¹⁸ F]SiFA-Tz ([¹⁸ F]6) in human plasma stability studies	14
Figure S17 Radio-HPLC profile of [¹⁸ F]SiFA-Tz ([¹⁸ F]6) metabolites found in blood	15

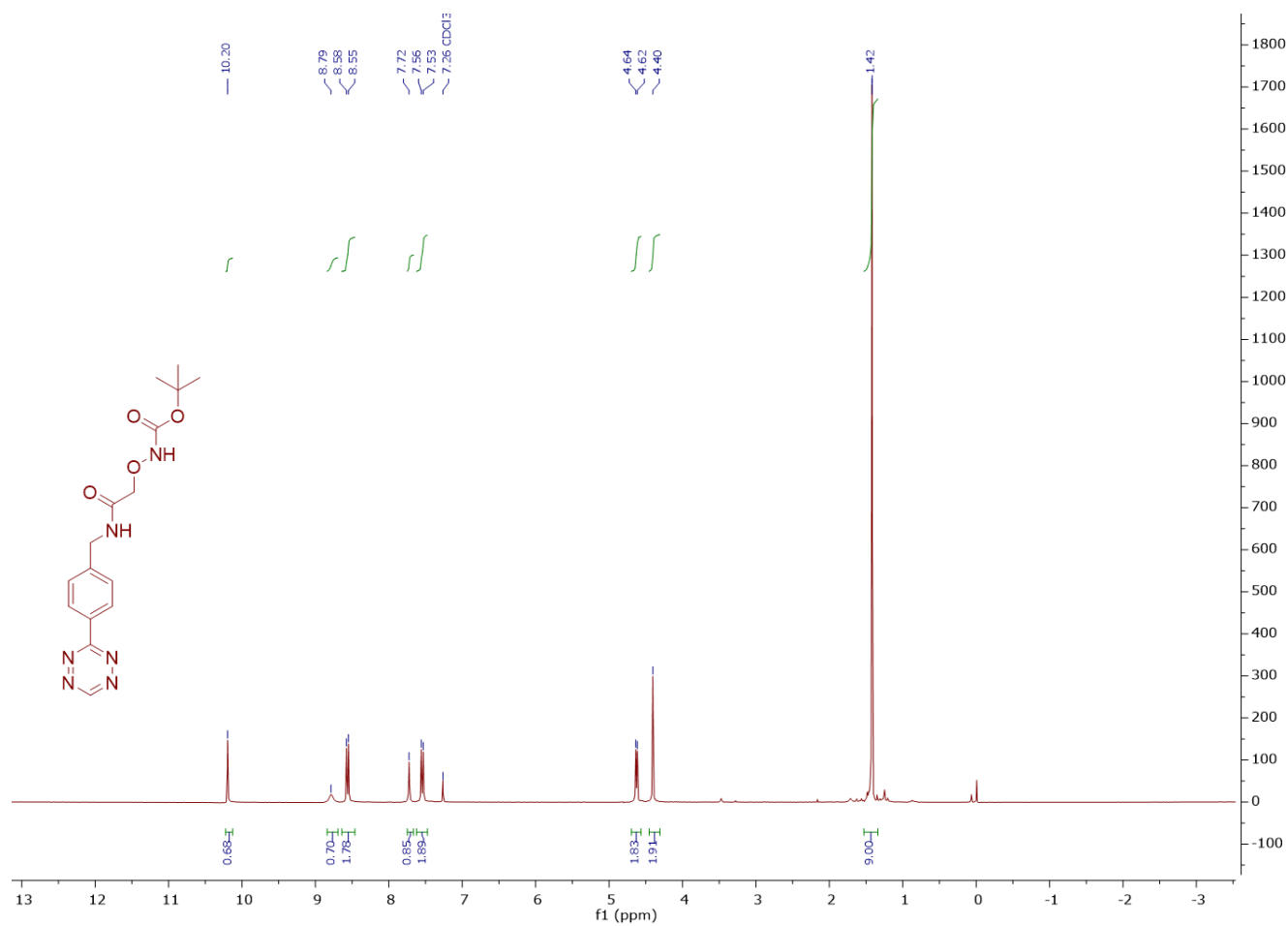


Figure S1. $^1\text{H-NMR}$ (300 MHz, CDCl_3) of compound **3**.

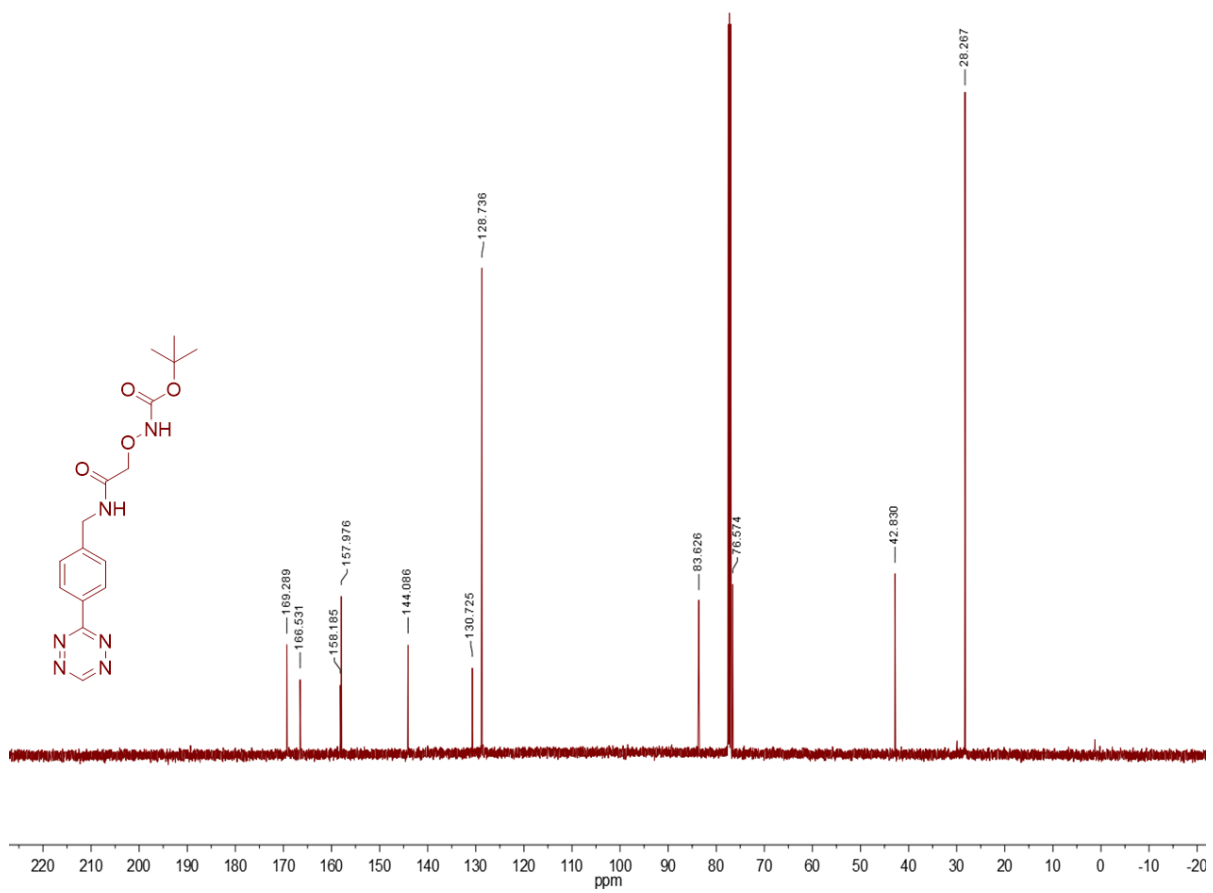


Figure S2. ¹³C-NMR (75 MHz, CDCl₃) of compound **3**.

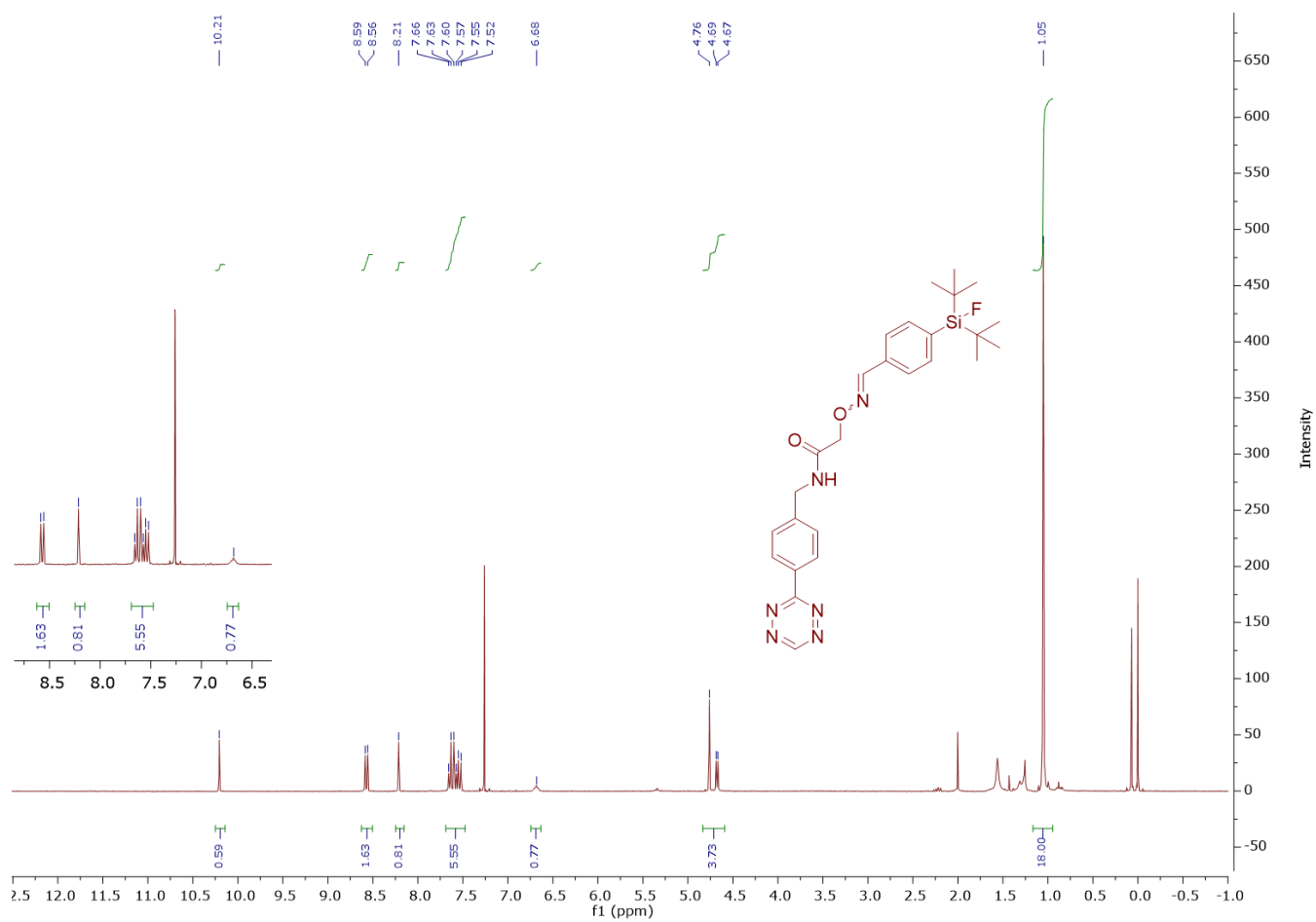


Figure S3. $^1\text{H-NMR}$ (500 MHz, CDCl_3) of SiFA-Tz (6).

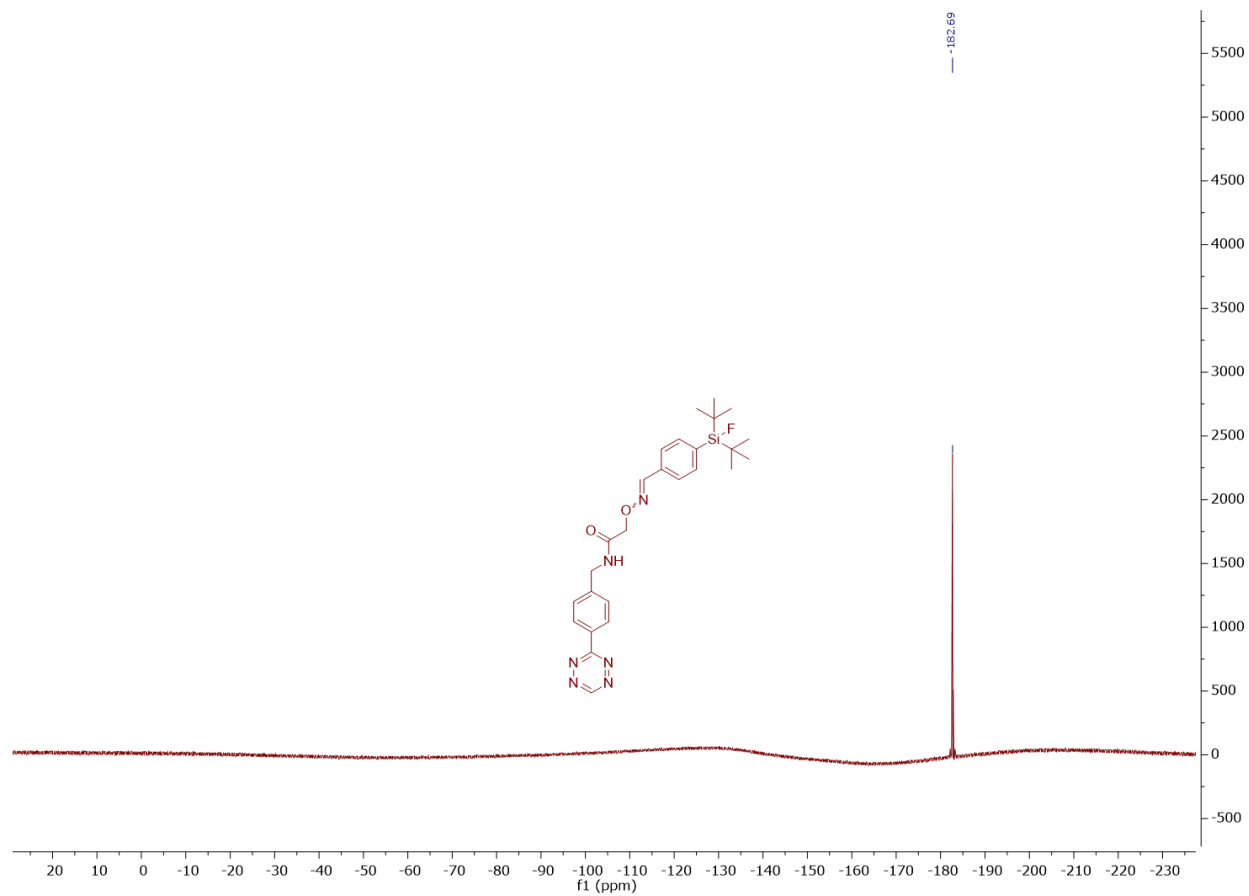


Figure S4. ^{19}F -NMR (282 MHz, CDCl_3) of SiFA-Tz (**6**).

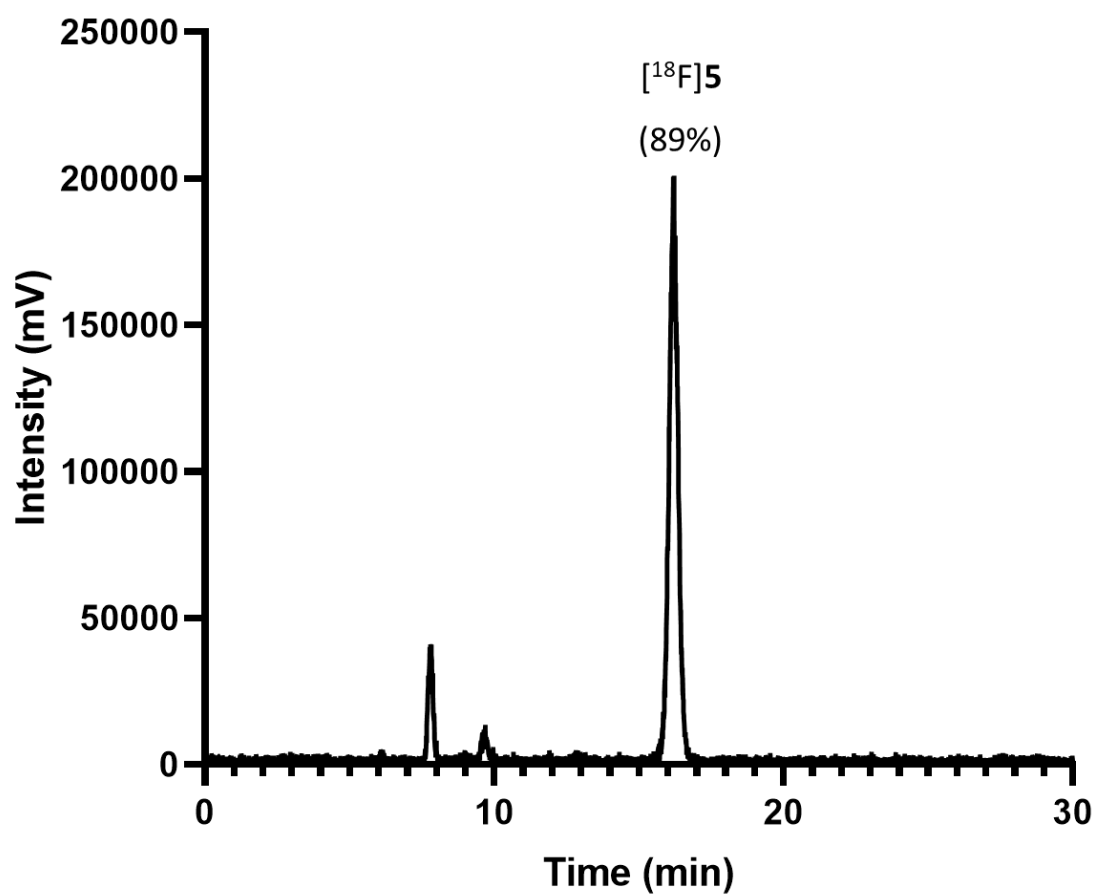


Figure S6. Radio-HPLC chromatogram of crude $[^{18}\text{F}]$ SiFA ($[^{18}\text{F}]5$) (Radiodetector).

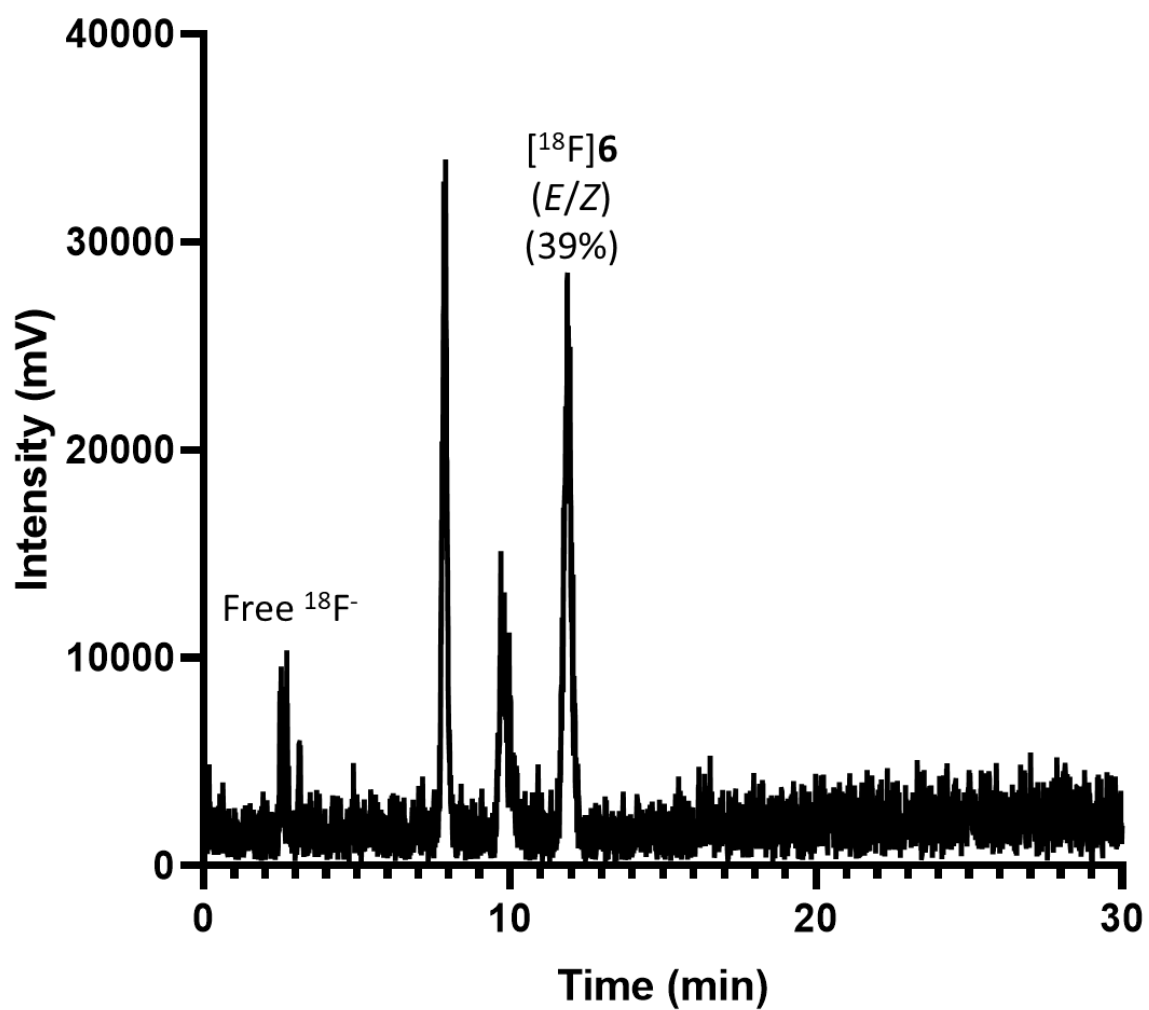


Figure S7. Radio-HPLC chromatogram of oxime formation (two-step method) for $[^{18}\text{F}]\text{SiFA-Tz}$ ($[^{18}\text{F}]\mathbf{6}$) crude (radiodetector).

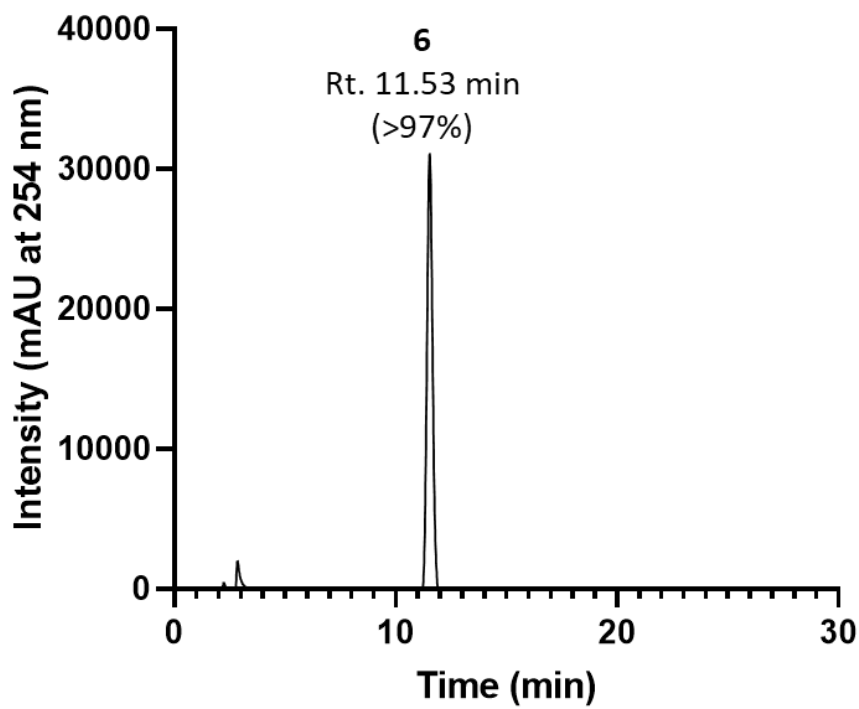
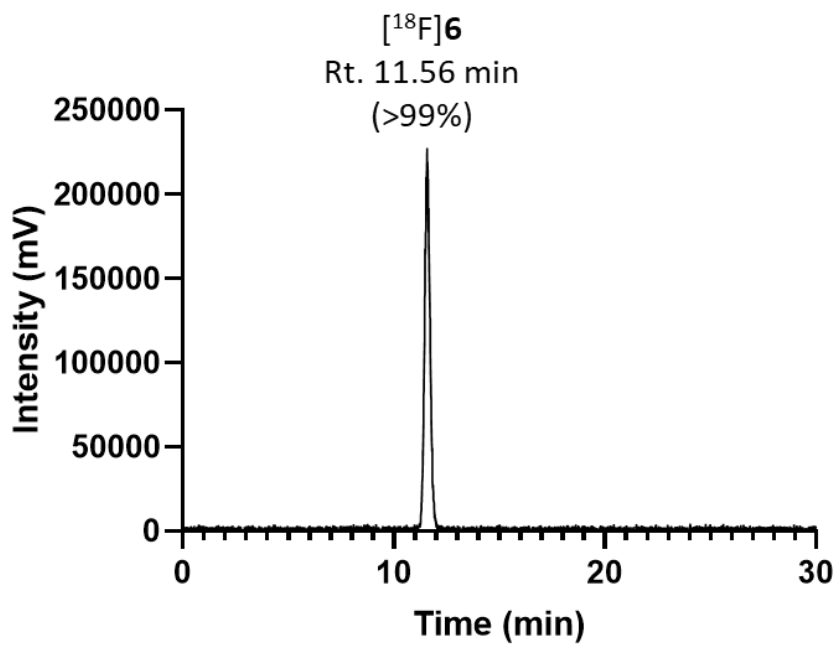


Figure S8. HPLC chromatograms of formulated [¹⁸F]SiFA-Tz ([¹⁸F]6) analyzed by radiodetector (top) and PDA -detector (bottom).

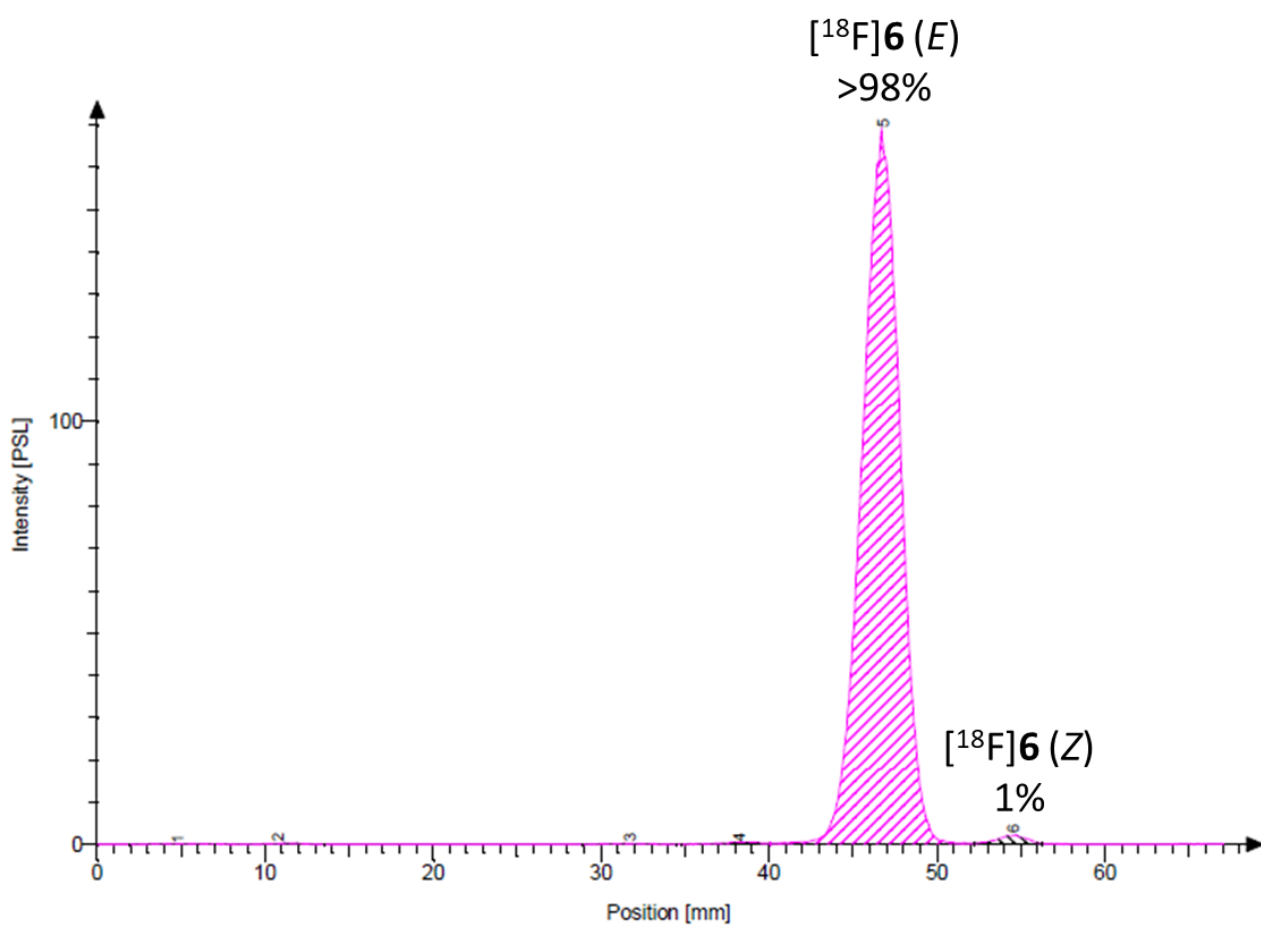


Figure S9. Radio-TLC chromatogram (digital autoradiography) of [18F]SiFA-Tz ([18F]6).

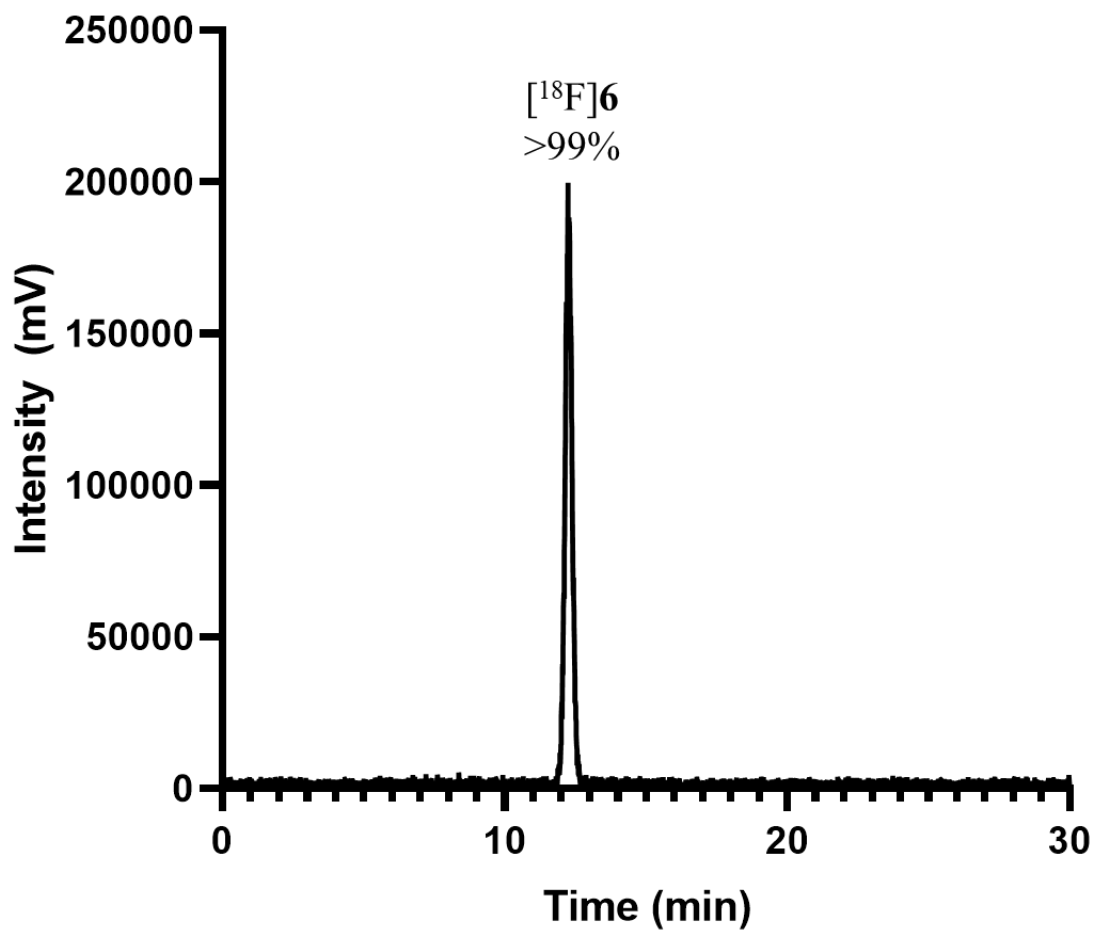


Figure S10. Radio-HPLC chromatogram of [¹⁸F]SiFA-Tz ([¹⁸F]6) stability at 90 minutes in 1×PBS (radiodetector).

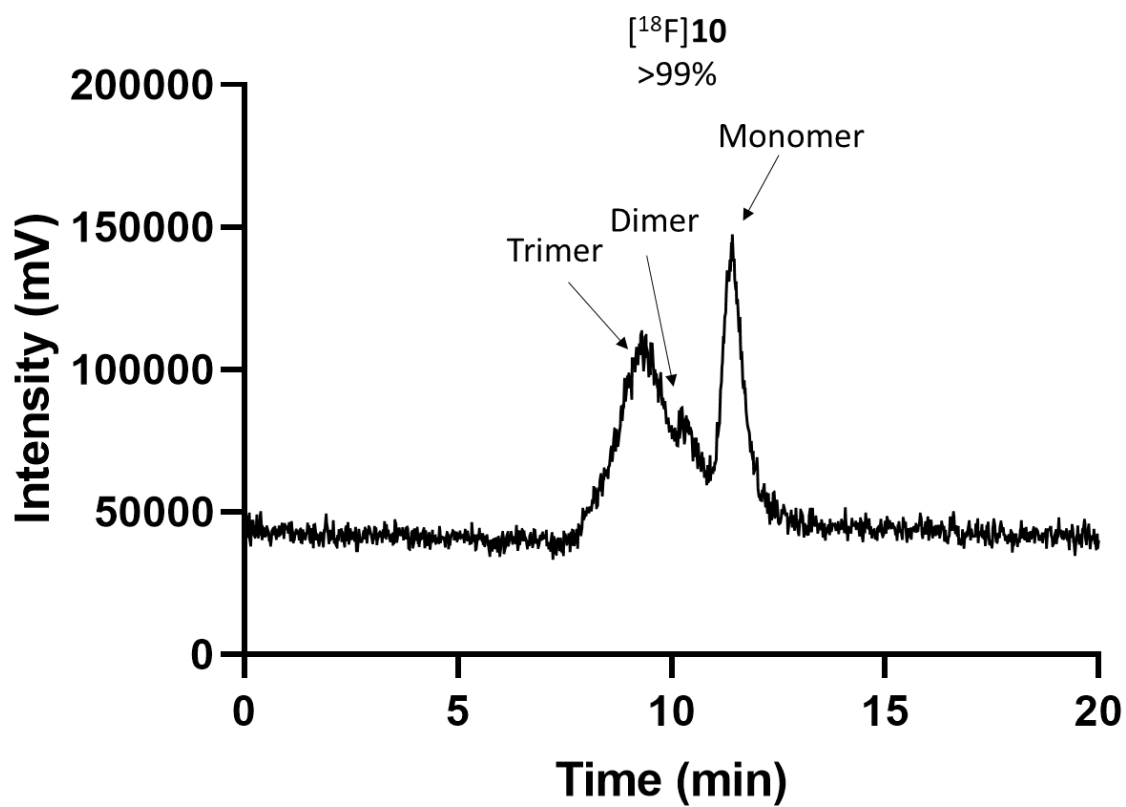


Figure S11. Radio-HPLC chromatogram of [^{18}F]fluoroalbumin ([^{18}F]10) (radiodetector).

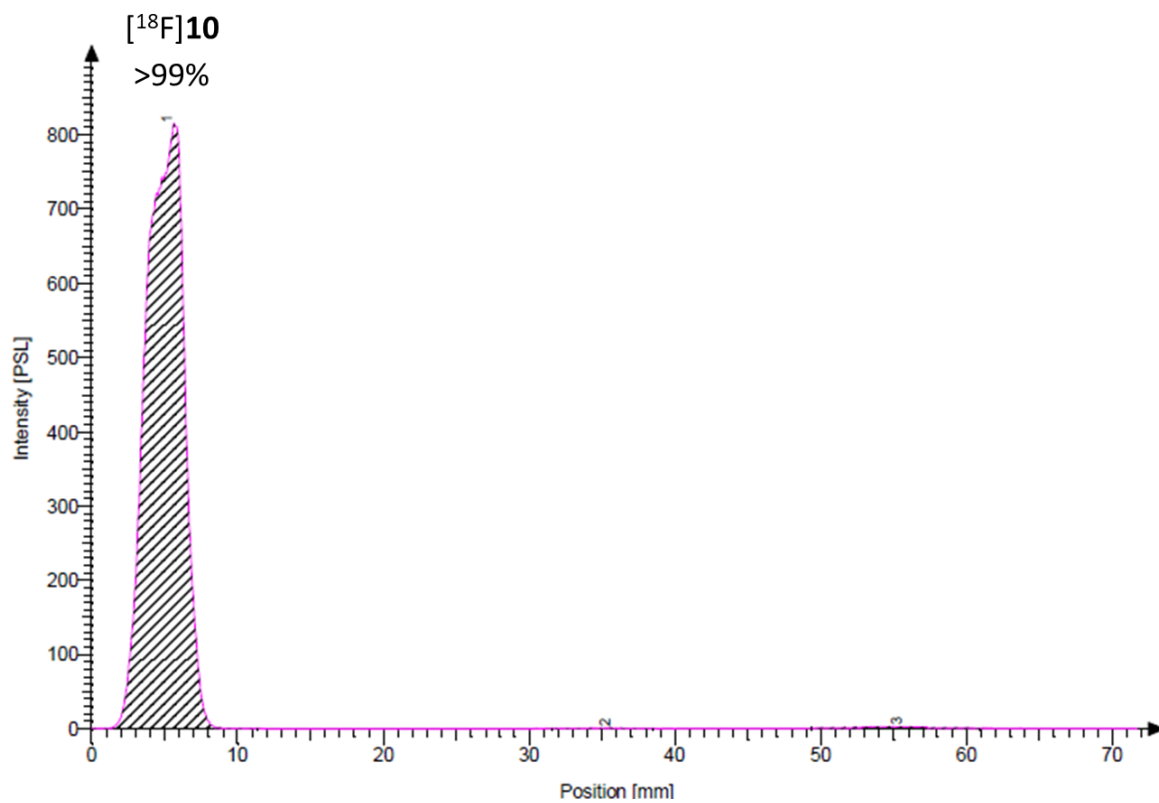


Figure S12. Radio-TLC chromatogram (digital autoradiography) of [^{18}F]fluoroalbumin ([^{18}F]10).

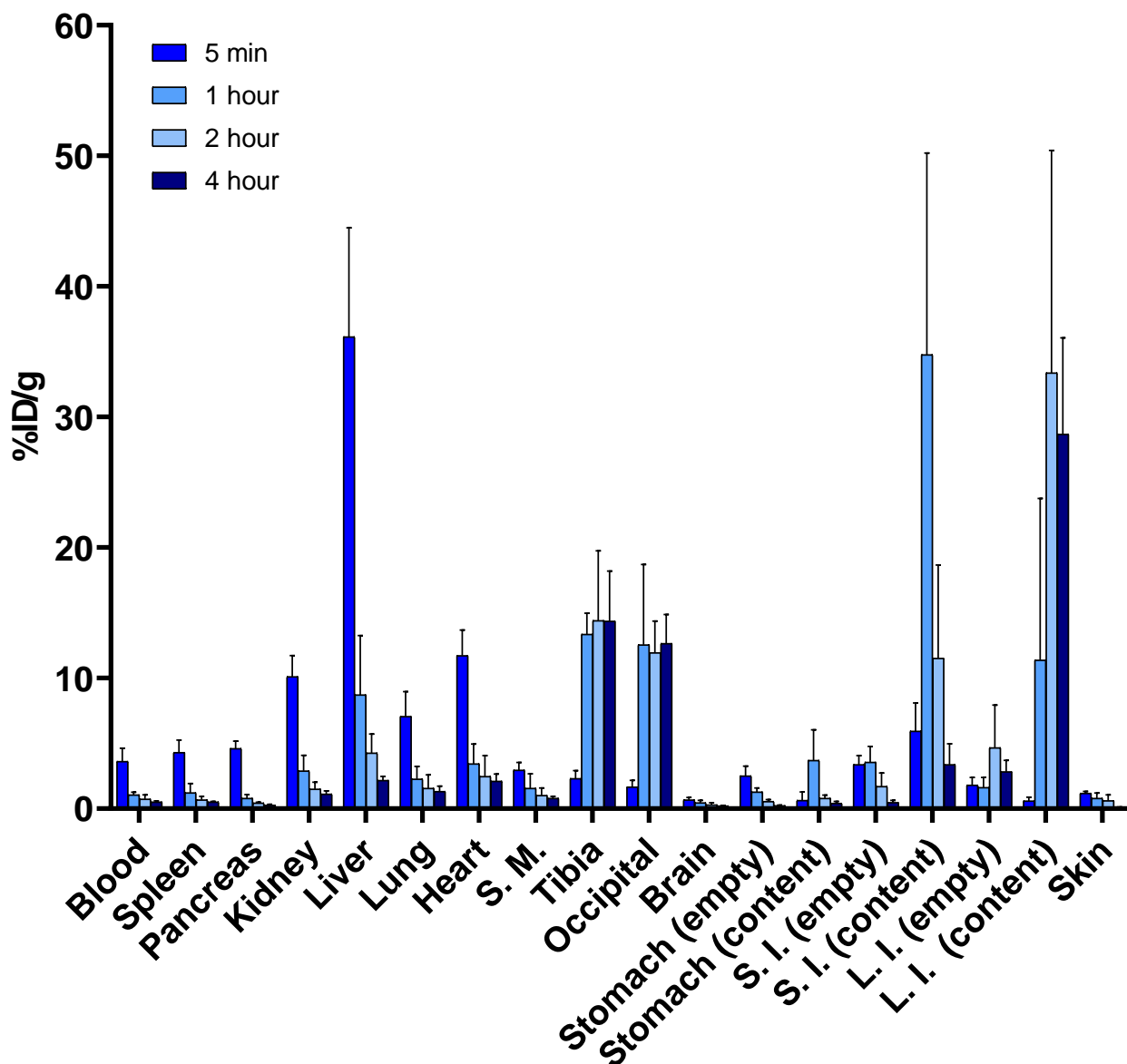


Figure S13. Biodistribution of radioactivity after intravenous administration of [^{18}F]SiFA-Tz ([^{18}F]6) demonstrating fast clearance from circulation, hepatobiliary excretion and high bone uptake at 60 minutes post-injection.

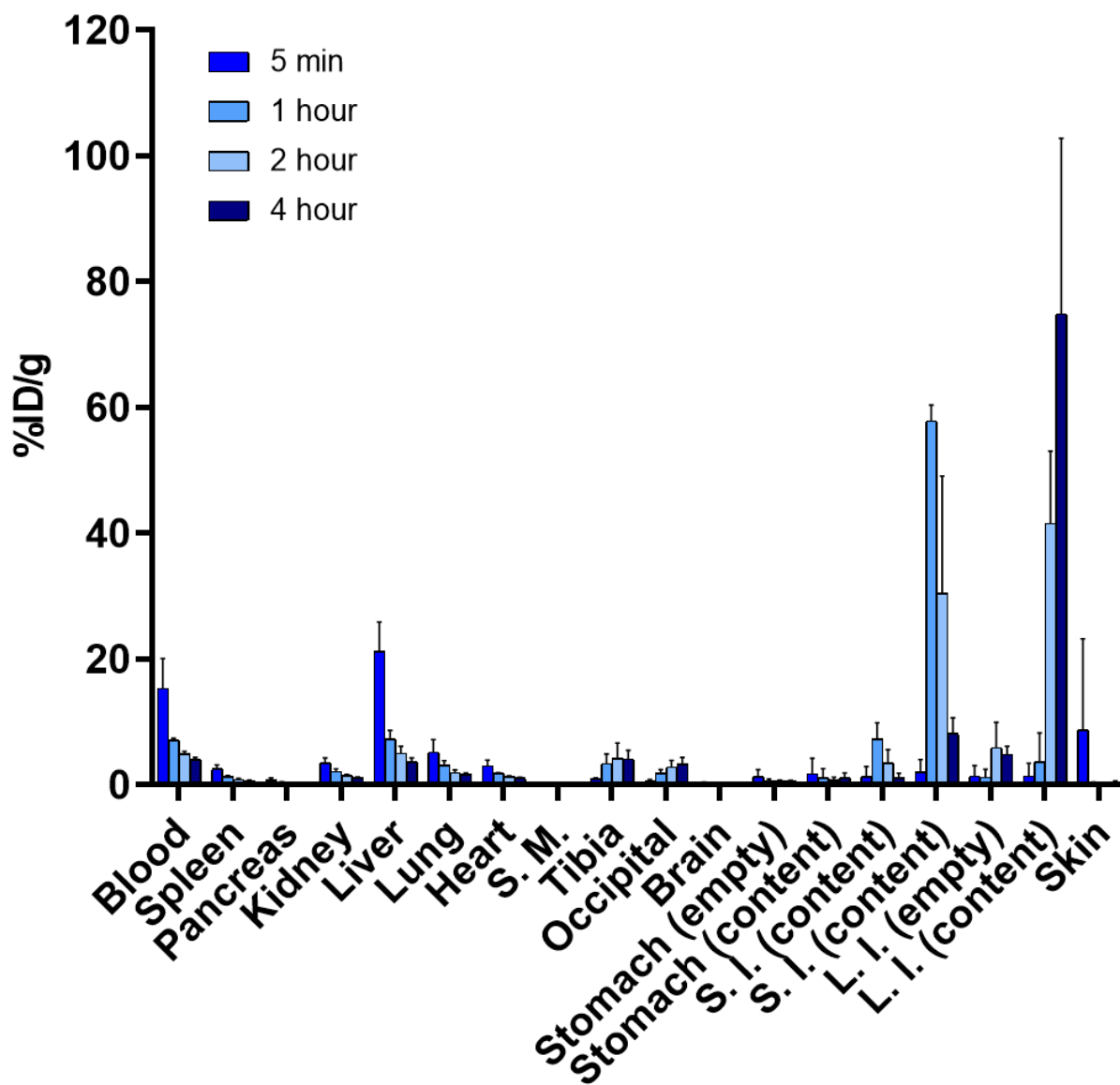


Figure S14. Biodistribution of radioactivity after intravenous administration of [^{18}F]fluoroalbumin (^{18}F 10) demonstrating prolonged residence time in circulation.

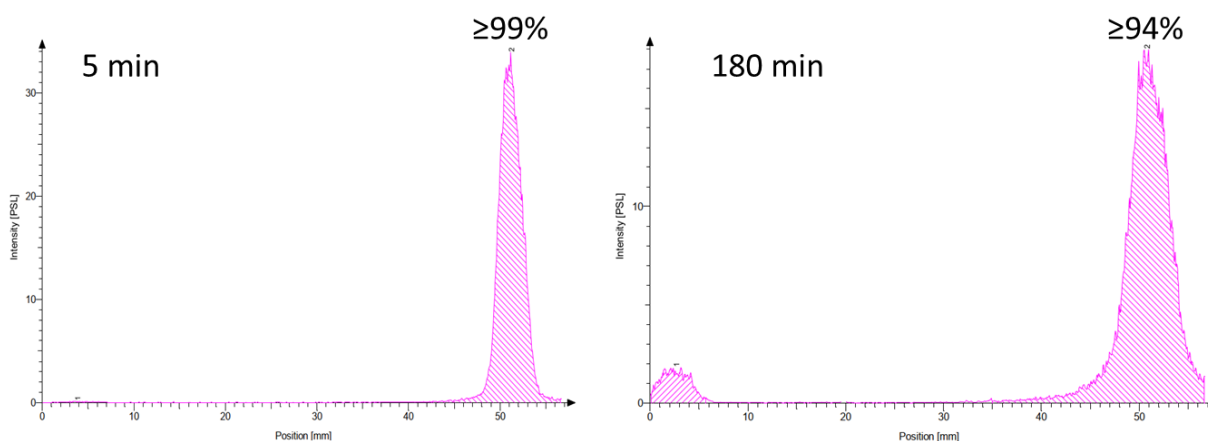


Figure S15. Radio-TLC (digital autoradiography) chromatograms of $[^{18}\text{F}]\text{SiFA-Tz}$ ($[^{18}\text{F}]\mathbf{6}$) in human plasma stability studies show minor defluorination of the radiotracer at 180 minutes after start of incubation.

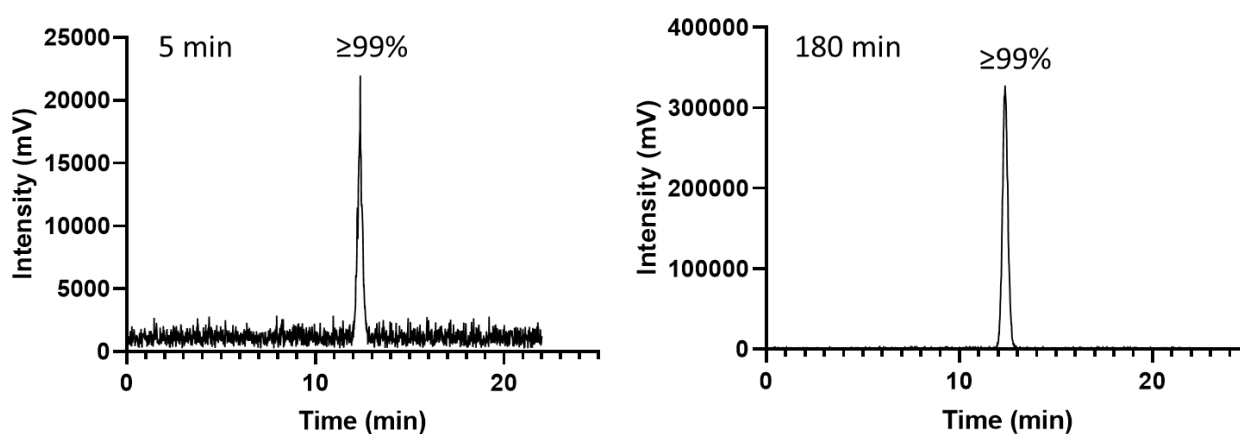


Figure S16. Radio-HPLC chromatograms of $[^{18}\text{F}]\text{SiFA-Tz}$ ($[^{18}\text{F}]\mathbf{6}$) in human plasma stability studies demonstrating no detectable decomposition.

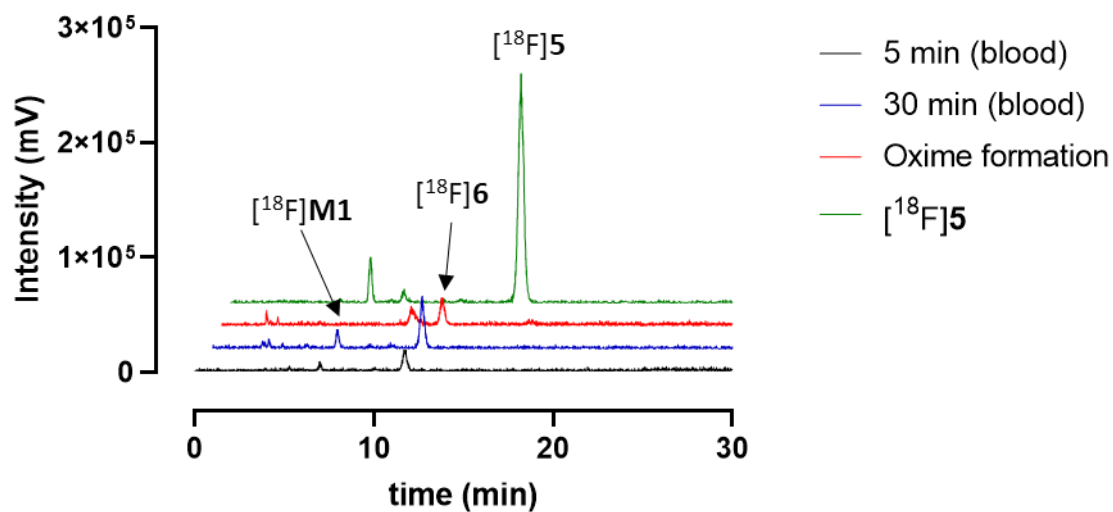


Figure S17. Radio-HPLC chromatograms of radiolabeling of $[^{18}\text{F}]\text{SiFA}$ -aldehyde ($[^{18}\text{F}]\mathbf{5}$), oxime formation producing $[^{18}\text{F}]\text{SiFA}$ -Tz ($[^{18}\text{F}]\mathbf{6}$) and metabolites ($t = 5$ min, 30 min) found in mouse blood after intravenous administration of $[^{18}\text{F}]\text{SiFA}$ -Tz ($[^{18}\text{F}]\mathbf{6}$).