

Supporting Information

Fully Automated Peptide Radiolabeling from [^{18}F]Fluoride

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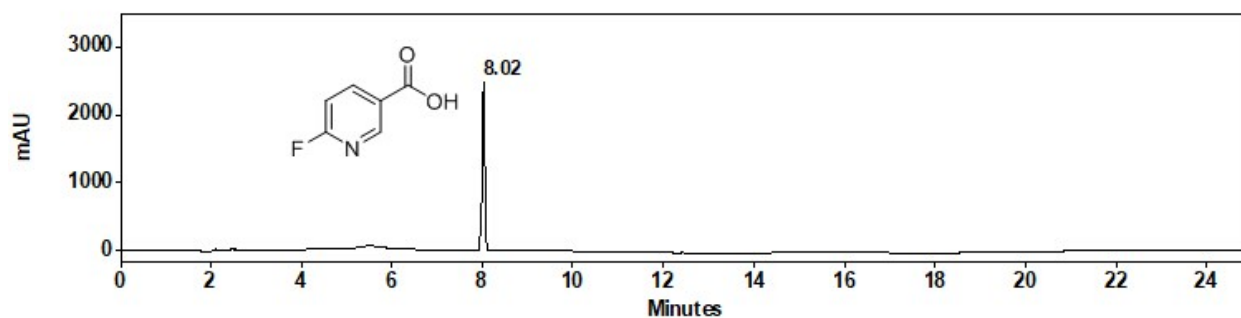
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S1-Table of commands for ELIXYS Flex/Chem Radiosynthesizer software sequence for the radiolabeling of peptides

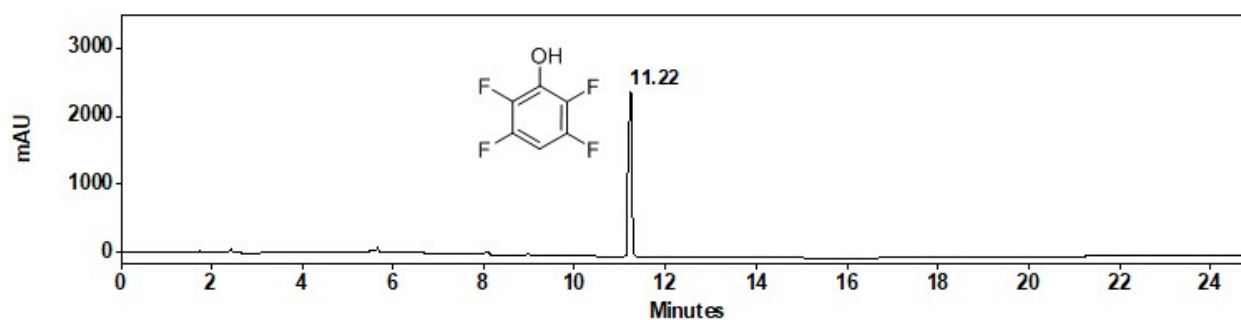
Table S1: List of Commands in Sequence

Operation #	Command	Description of Function	Time
1	Prompt/Initialize	Prompt to install SPE cartridges, fill dilution flask, and initializes hardware	4 min
2	Trap Isotope (^{18}F)	Loads ^{18}F -water (5 PSI) from preloaded external vial onto PS- HCO_3 anion exchange cartridge	1.5 min
3	Elute Isotope (^{18}F)	Elutes ^{18}F from PS- HCO_3 anion exchange cartridge (5 PSI) with $\text{K}_{222}/\text{K}_2\text{CO}_3$ (20mg/4mg) in 94:6 (MeCN:H $_2$ O, 2 mL)	2 min
4	Evaporate	Evaporates contents of reactor 1 at 110°C at 10 PSI	4 min
5	Elute Isotope	Transfers MeCN (1 mL) over the PS- HCO_3 anion exchange cartridge at 5 PSI	0.25 min
6	Evaporate	Evaporates and dries ^{18}F with MeCN (1 mL) at 110°C at 10 PSI	1.5 min
7	Add Reagent	Adds MeCN (1 mL) to reactor 1 at 3 PSI	0.25 min
8	Evaporate	Evaporates and dries ^{18}F with MeCN (1 mL) at 110°C at 10 PSI	1.5 min
9	Add Reagent	Adds the precursor (10 mg) in 4:1 tBuOH:MeCN (1 mL) at 3 PSI	0.25 min
10	React	Stirs contents of reactor 1 at 40°C	10 min
11	Transfer	Transfers the precursor mixture into the dilution flask (15 mL, H $_2$ O) and passes contents over the MCX-cartridge into waste at 15 PSI	6 min
12	Add Reagent	Adds H $_2$ O (2.5 mL) into reactor 1 at 3 PSI	0.25 min
13	Add Reagent	Adds H $_2$ O (2.5 mL) into reactor 1 at 3 PSI	0.25 min
14	Transfer	Transfers the H $_2$ O (5 mL) into dilution flask and over the MCX-cartridge into waste at 15 PSI	2 min
15	Add Reagent	Adds MeCN (3 mL) into reactor 1 at 3 PSI	0.25 min
16	Transfer	Transfers the MeCN (3 mL) into the dilution flask and over the MCX-cartridge, eluting off the [^{18}F]FPy-TFP into reactor 2 at 6 PSI	1.5 min
17	Evaporate	Evaporates [^{18}F]FPy-TFP in MeCN (3 mL) at 40°C at 10 PSI	7.5 min
18	Add Reagent	Adds peptide (1 mg) in DMSO (0.5 mL) and DIPEA (10 μL) at 3 PSI into reactor 2	0.25 min
19	React	Stirs contents of reactor 2 at 40°C	15 min
20	Move Reactor	Moves Reactor to front of instrument	0.5 min
21	Prompt/End	Prompt the end of run/save sequence	1 min

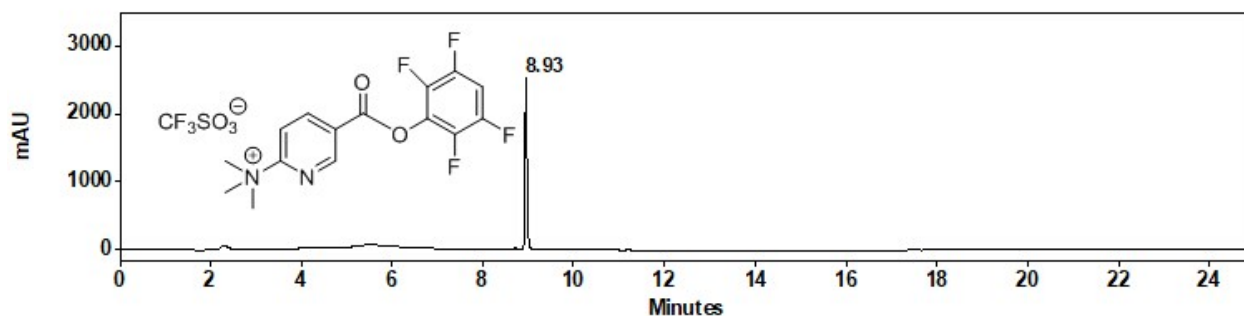
S2-HPLC UV (220 nm) Chromatogram of 6-fluoronicotinic acid, Retention time 8.02 min



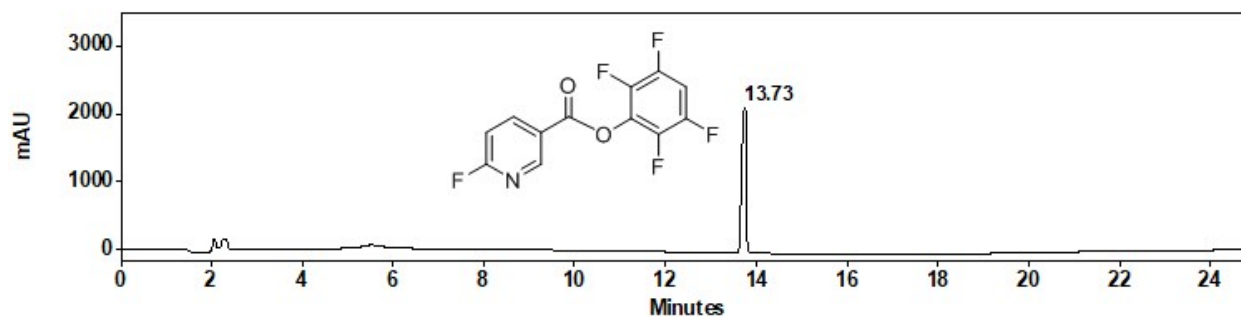
S3-HPLC UV (220 nm) Chromatogram of 2,3,5,6-tetrafluorophenol, Retention time 11.22 min



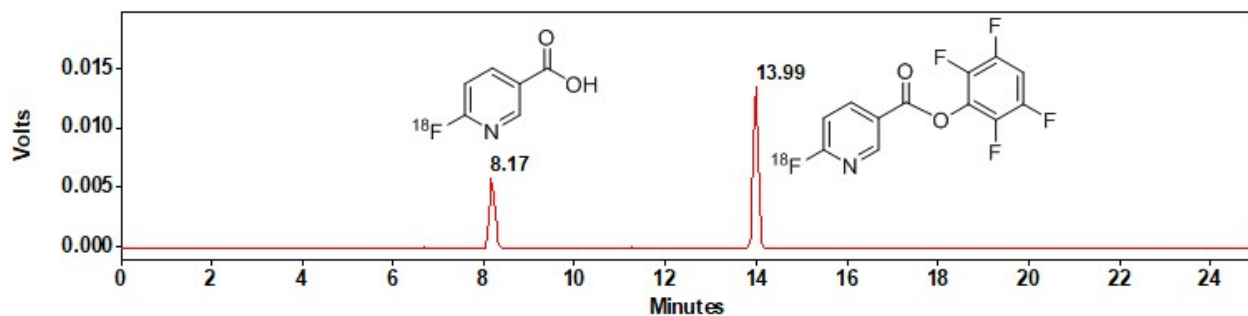
S4-HPLC UV (220 nm) Chromatogram of PyTFP-precursor (4): *N,N,N*-trimethyl-5-((2,3,5,6-tetrafluorophenoxy)carbonyl)pyridine-2-amminium fluoromethanesulfonate, Retention time 8.93 min



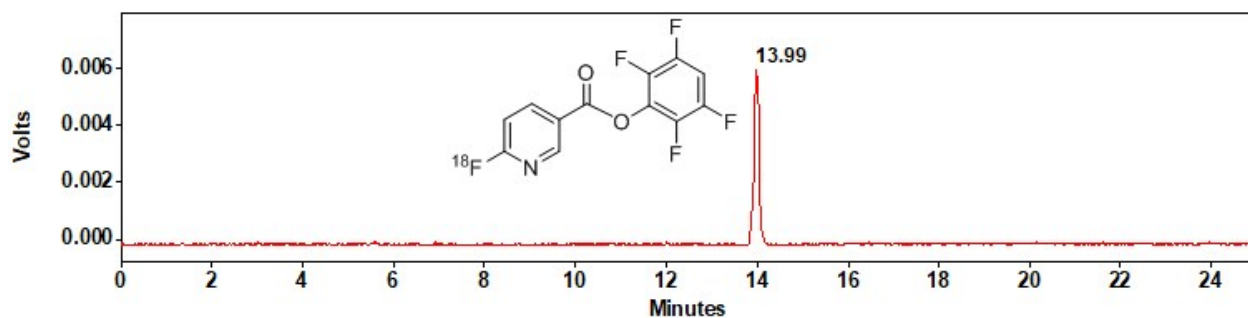
S5-HPLC UV (220 nm) Chromatogram of ¹⁹FPy-TFP, Retention time 13.73 min



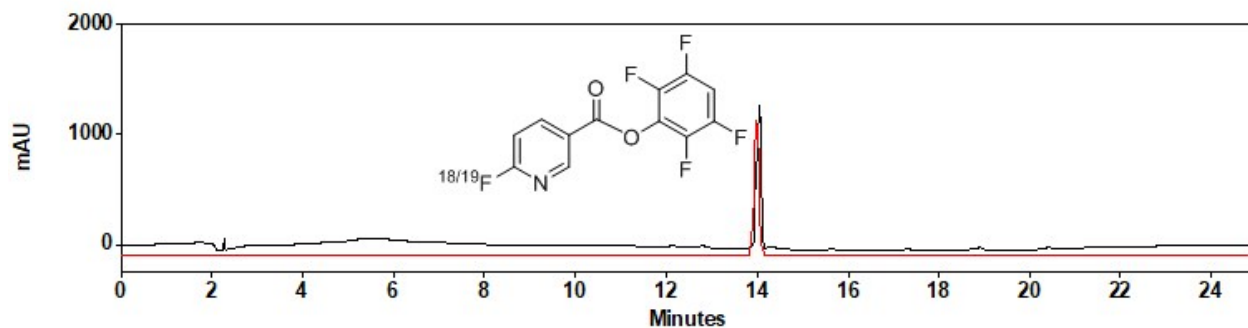
S6-HPLC Radioactive (PMT) Chromatogram of Crude [^{18}F]FPy-TFP (5),
Retention time-13.99 min



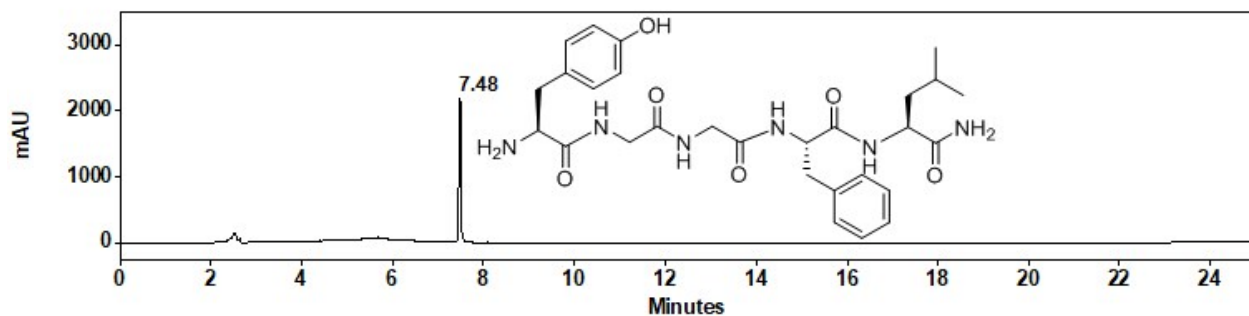
S7-HPLC Radioactive (PMT) Chromatogram of HPLC Purified [^{18}F]FPy-TFP (5),
Retention time-13.99 min



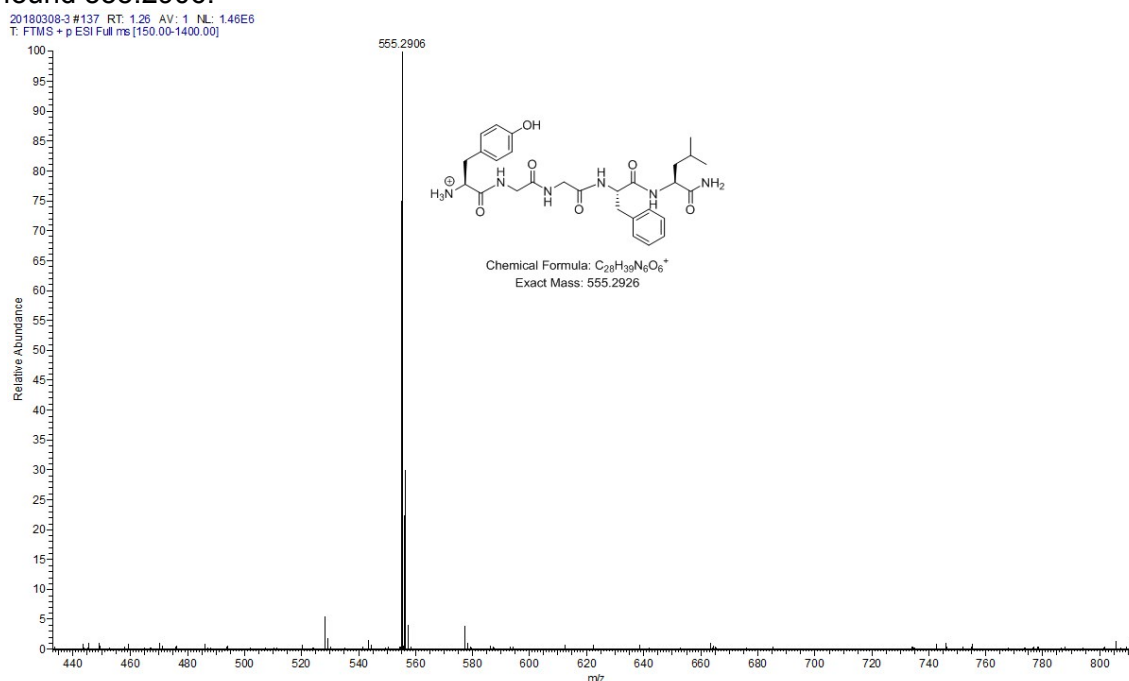
S8-HPLC Radioactive (PMT-red) and UV (220 nm-black) Chromatogram of HPLC
Purified [^{18}F]FPy-TFP (5) Spiked with ^{19}F Py-TFP



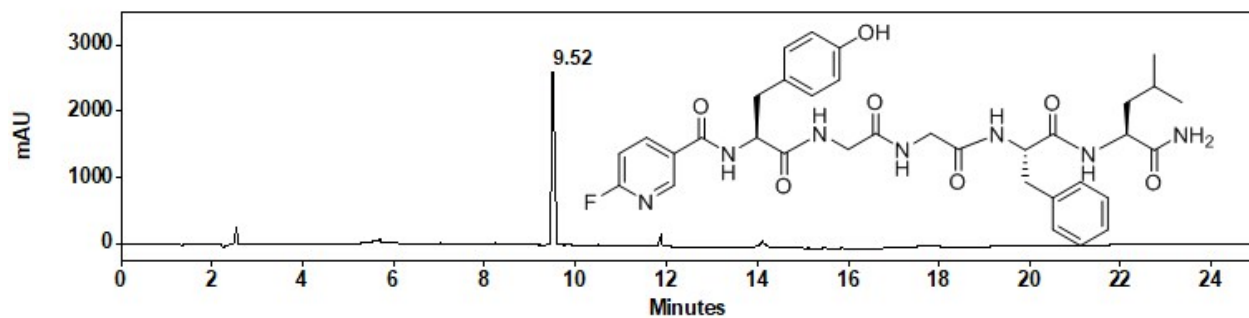
S9- HPLC UV (220 nm) Chromatogram of YGGFL (**1**), Compound: NH₂-YGGFL, Retention time 7.48 min



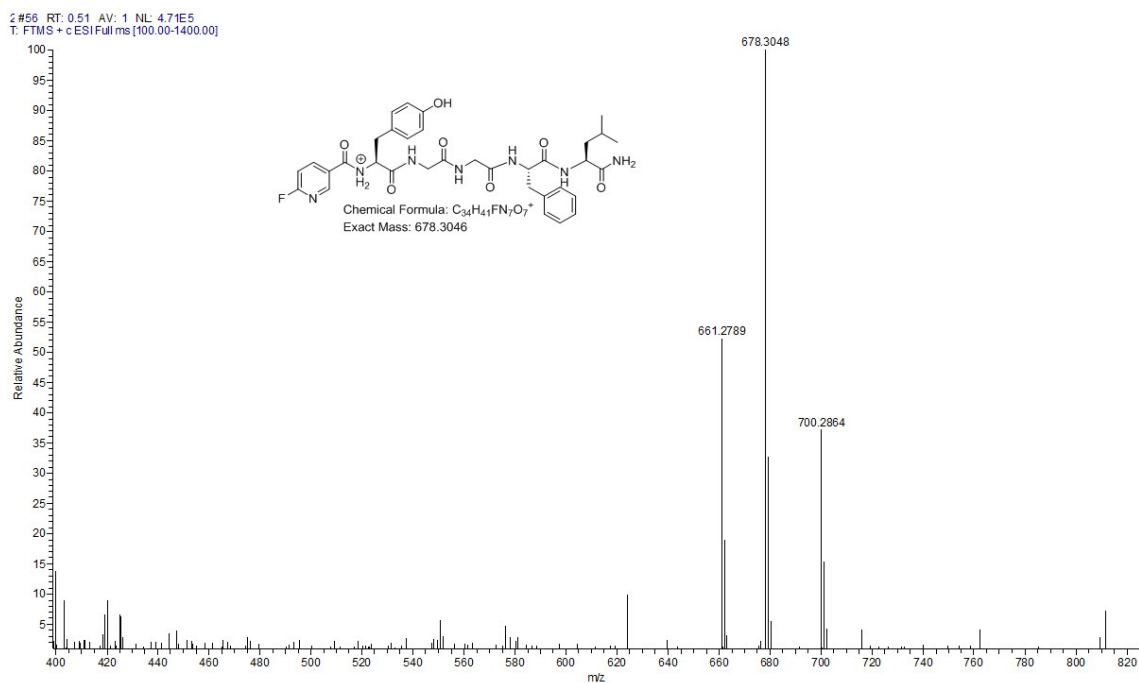
S10- Mass Spectrum (ESI-MS) of YGGFL (**1**) for C₂₈H₃₉N₆O₆, [M+H]⁺ calc'd 555.2926, found 555.2906.



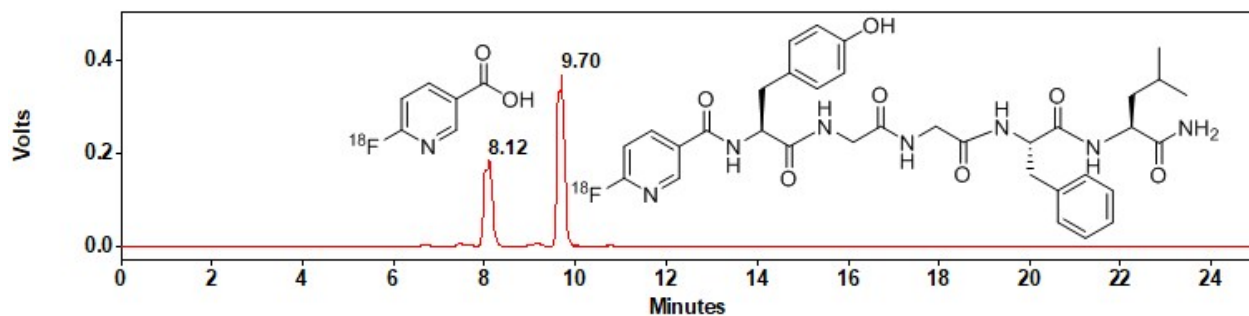
S11- HPLC UV (220 nm) Chromatogram of ¹⁹FPy-YGGFL, Retention time 9.52 min



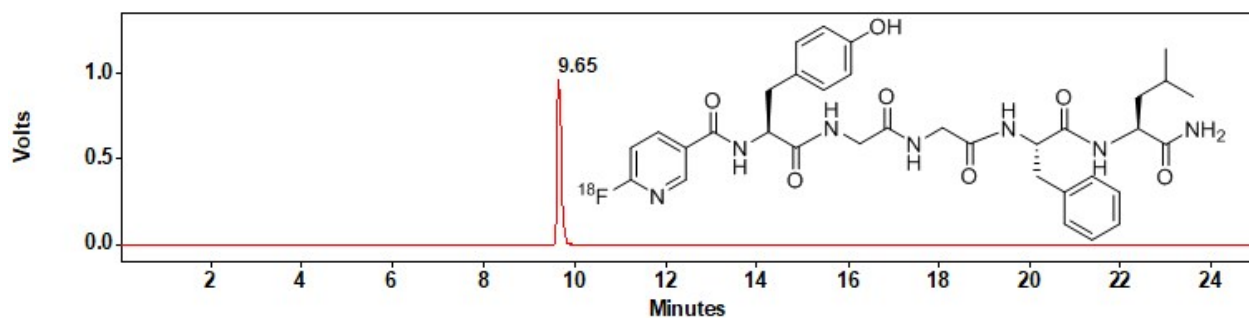
S12- Mass Spectrum (ESI-MS) of ¹⁹FPy-YGGFL for C₃₄H₄₁FN₇O₇, [M+H]⁺ calc'd 678.3046, found 678.3048.



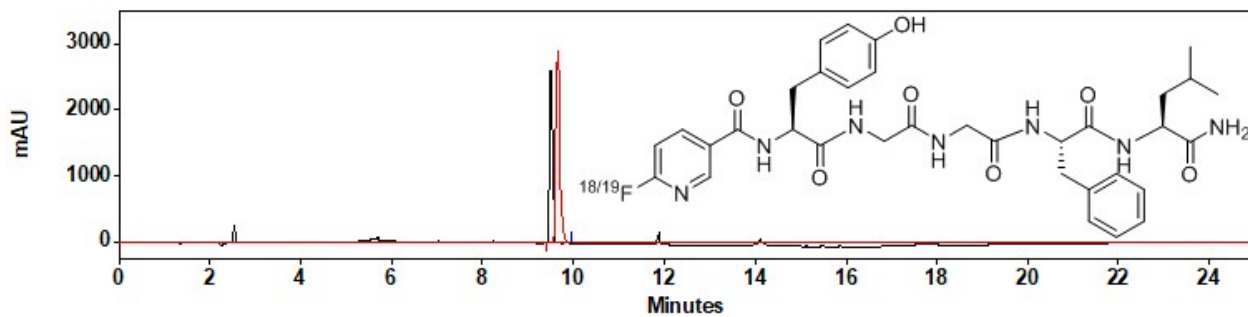
S13-HPLC Radioactive (PMT) Chromatogram of Crude [^{18}F]FPy-YGGFL (6),
Retention time 9.70 min



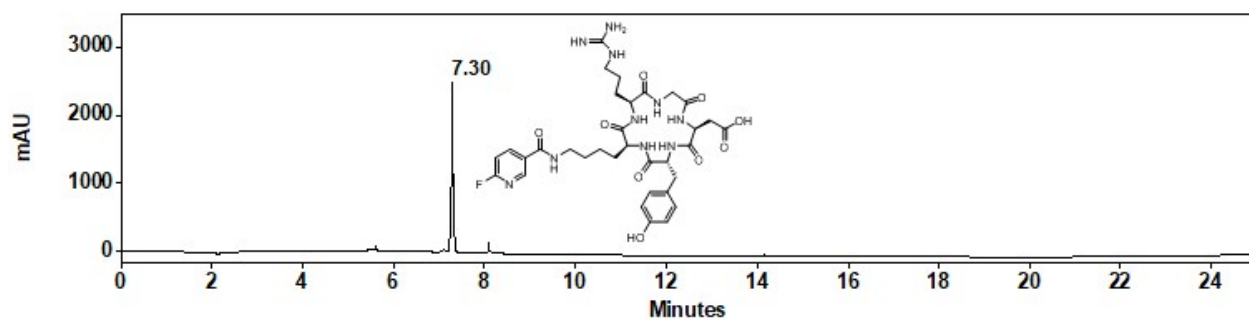
S14-HPLC Radioactive (PMT) Chromatogram of HPLC Purified [^{18}F]FPy-YGGFL (6),
Retention time 9.65 min



S15- HPLC Radioactive (PMT-red) and UV (220 nm-black) Chromatogram of
HPLC Purified [^{18}F]FPy-YGGFL (6) Spiked with ^{19}F Py-YGGFL

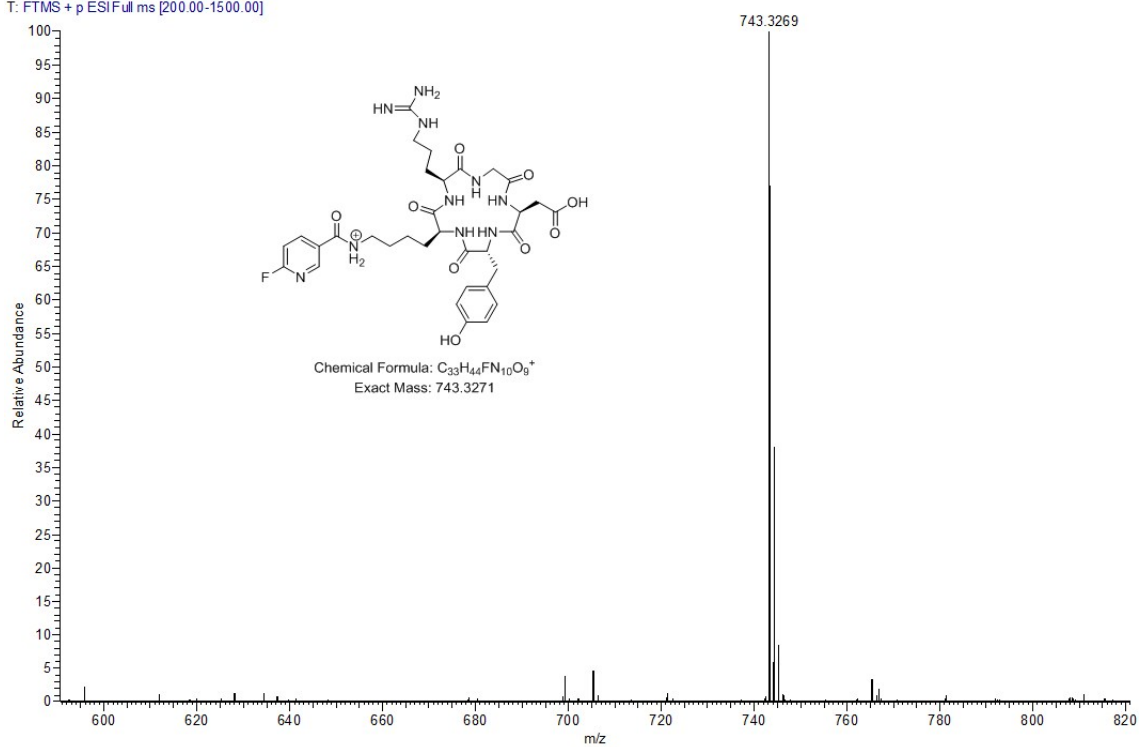


S16- HPLC UV (220 nm) Chromatogram of cRGDyK(¹⁹FPy), Retention time 7.30 min

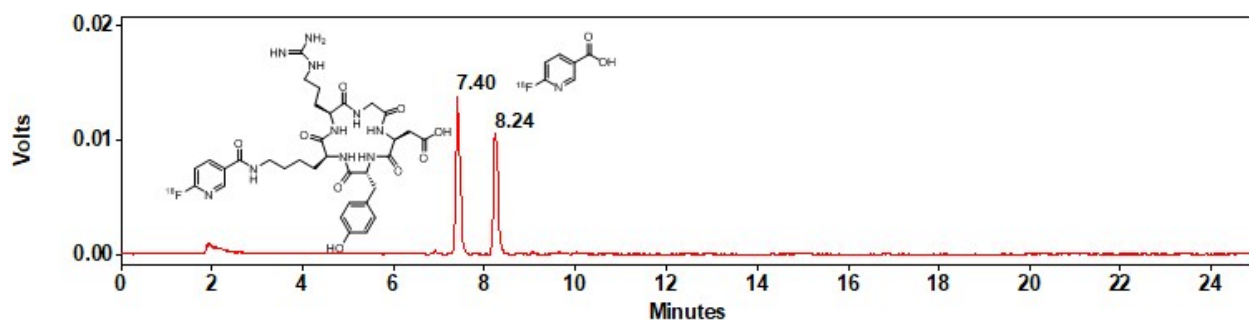


S17- Mass Spectrum (ESI-MS) of cRGDyK(¹⁹FPy) for C₃₃H₄₄FN₁₀O₉, [M+H]⁺ calc'd 743.3271, found 743.3269.

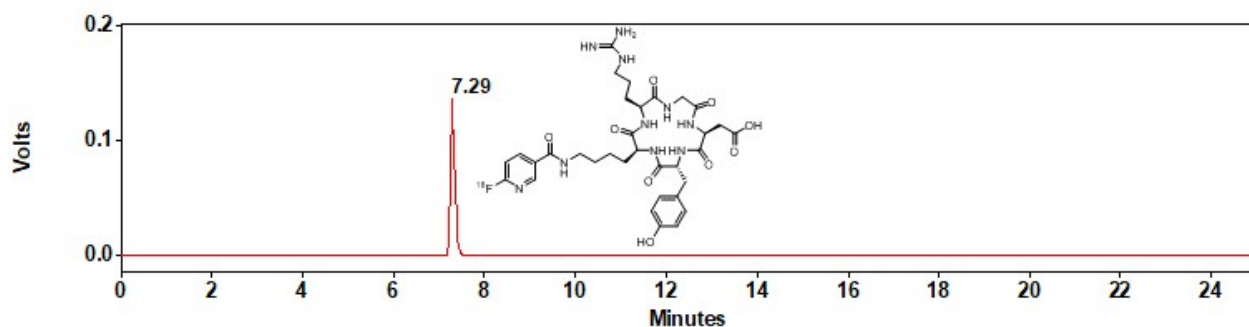
cRGDyK(Py) 170530161456 #91 RT: 0.85 AV: 1 NL: 2.91E6
T: FTMS + p ESI Full ms [200.00-1500.00]



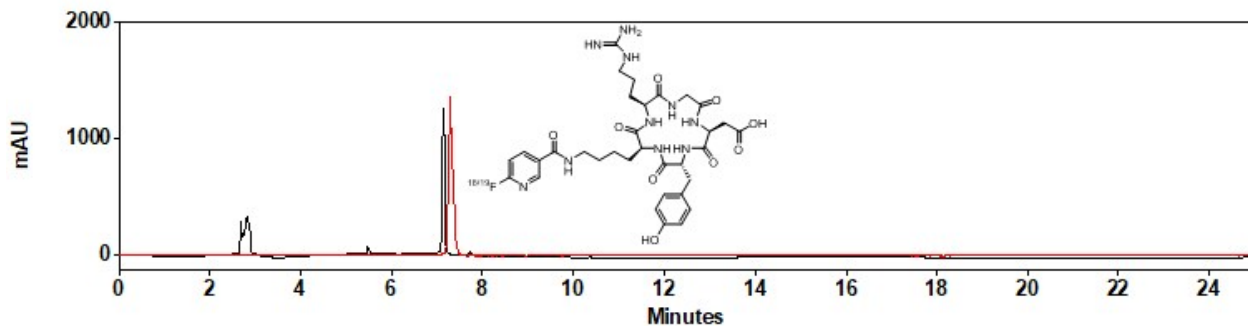
S18-HPLC Radioactive (PMT) Chromatogram of Crude cRGDyK([¹⁸F]FPy) (**7**), Retention time 7.40 min



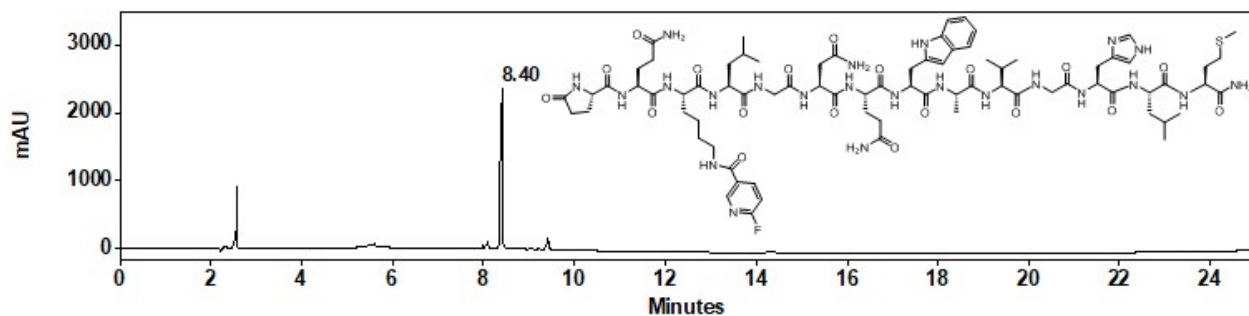
S19-HPLC Radioactive (PMT) Chromatogram of HPLC Purified cRGDyK([¹⁸F]FPy) (**7**), Retention time 7.29 min



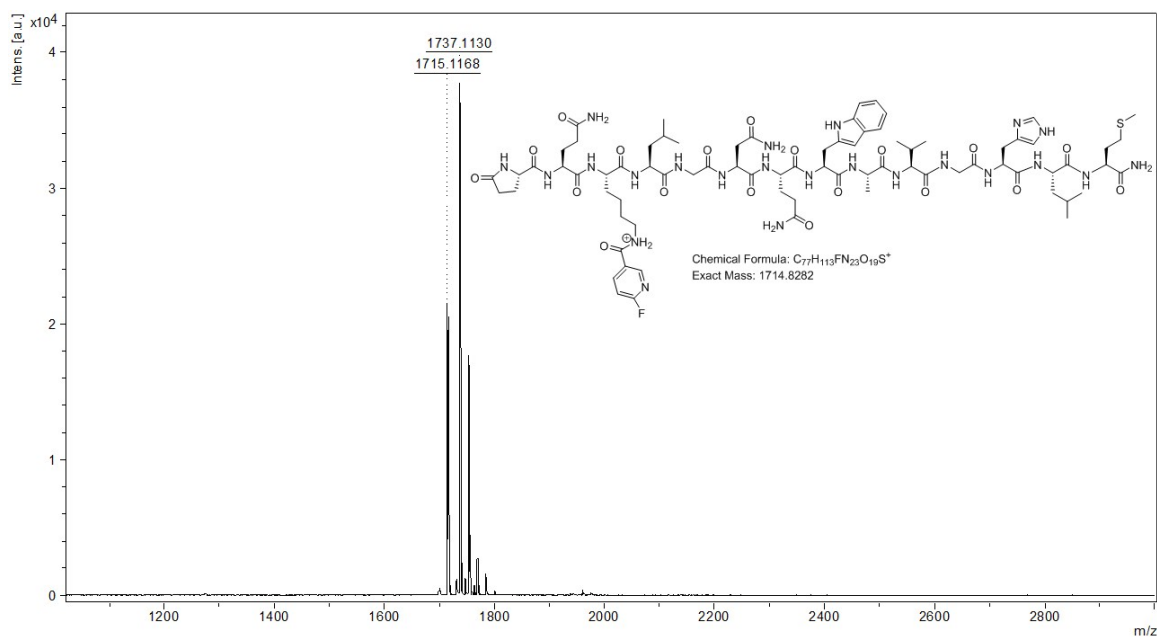
S20- HPLC Radioactive (PMT-red) and UV (220 nm-black) Chromatogram of HPLC Purified cRGDyK([¹⁸F]FPy) (**7**) Spiked with cRGDyK(¹⁹FPy)



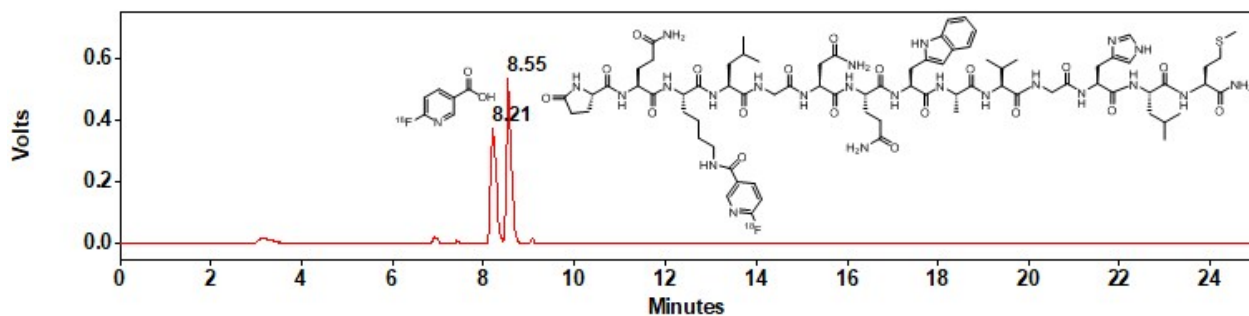
S21- HPLC UV (220 nm) Chromatogram of bombesin peptide, PyrQK(¹⁹FPy)LGNQWAVGHLM, Retention time 8.40 min



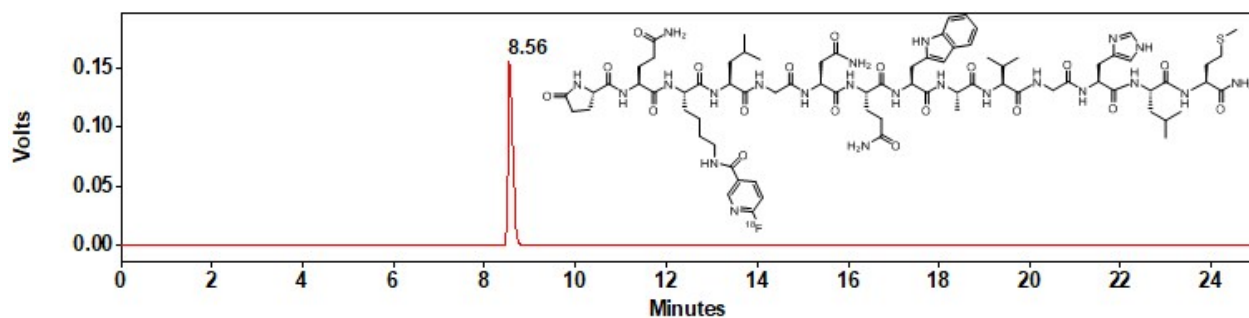
S22-Mass Spectrum (MALDI-MS) of bombesin peptide, Pyr-QK(¹⁹FPy)LGNQWAVGHLM for C₇₇H₁₁₃FN₂₃O₁₉S, [M+H]⁺ calc'd 1714.8282, found 1715.1168.



S23-HPLC Radioactive (PMT) Chromatogram of Crude bombesin peptide
PyrQK([¹⁸F]FPy)LGNQWAVGHLM (**8**), Retention time 8.55 min



S24-HPLC Radioactive (PMT) Chromatogram of HPLC Purified bombesin peptide
PyrQK([¹⁸F]FPy)LGNQWAVGHLM (**8**), Retention time 8.56 min



S25- HPLC Radioactive (PMT-red) and UV (220 nm-black) Chromatogram of HPLC Purified bombesin peptide PyrQK([¹⁸F]FPy)LGNQWAVGHLM (8**)**
Spiked with PyrQK([¹⁹F]FPy)LGNQWAVGHLM

