# Supplementary Materials

# Production of [$^{11}$C]Carbon Labeled Flumazenil and *L*-Deprenyl Using the iMiDEV™ Automated Microfluidic Radiosynthesizer

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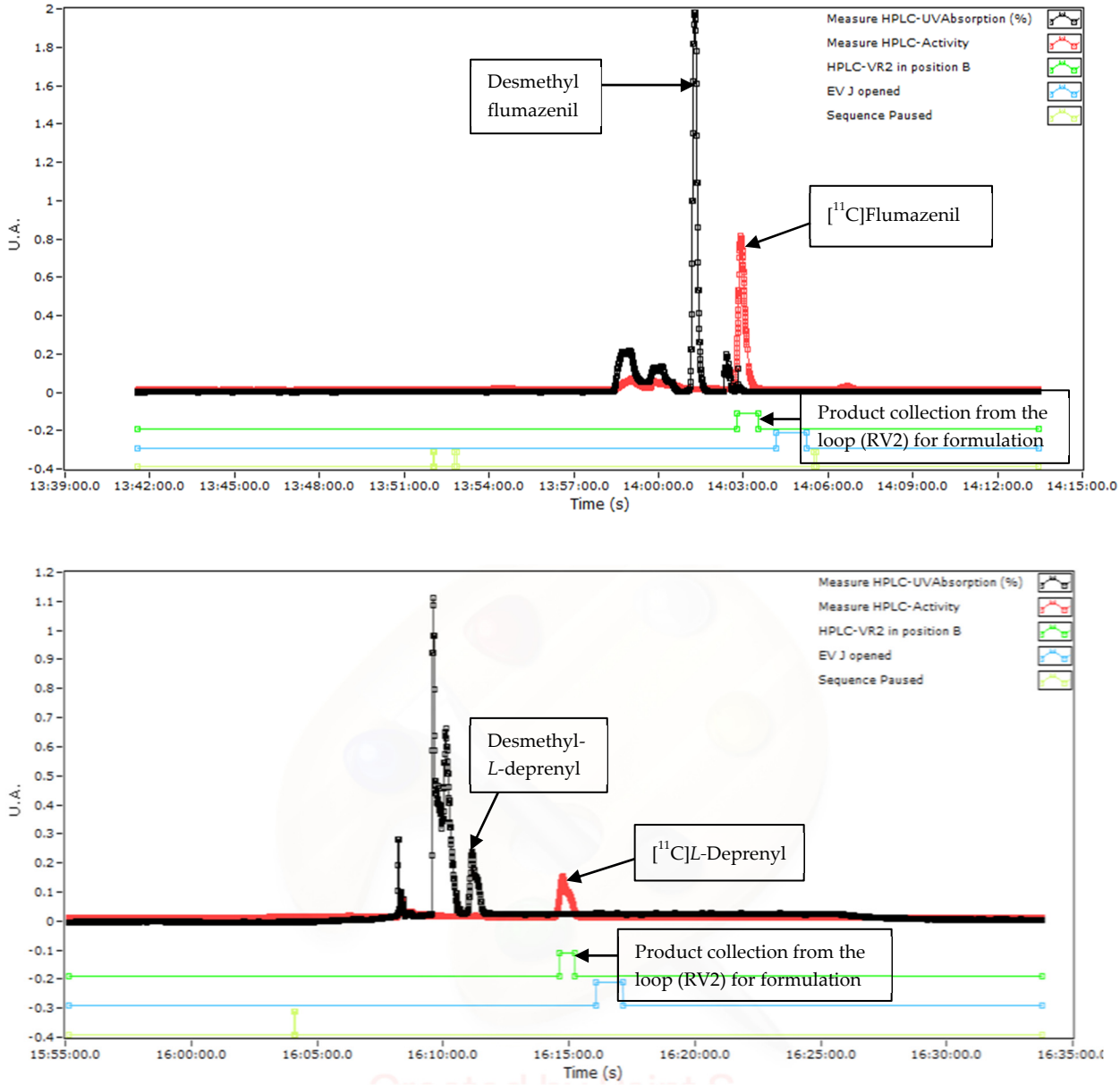


**Figure S1.** Semi preparative HPLC chromatograms of [$^{11}$C]flumazenil and [$^{11}$C]*L*-deprenyl.

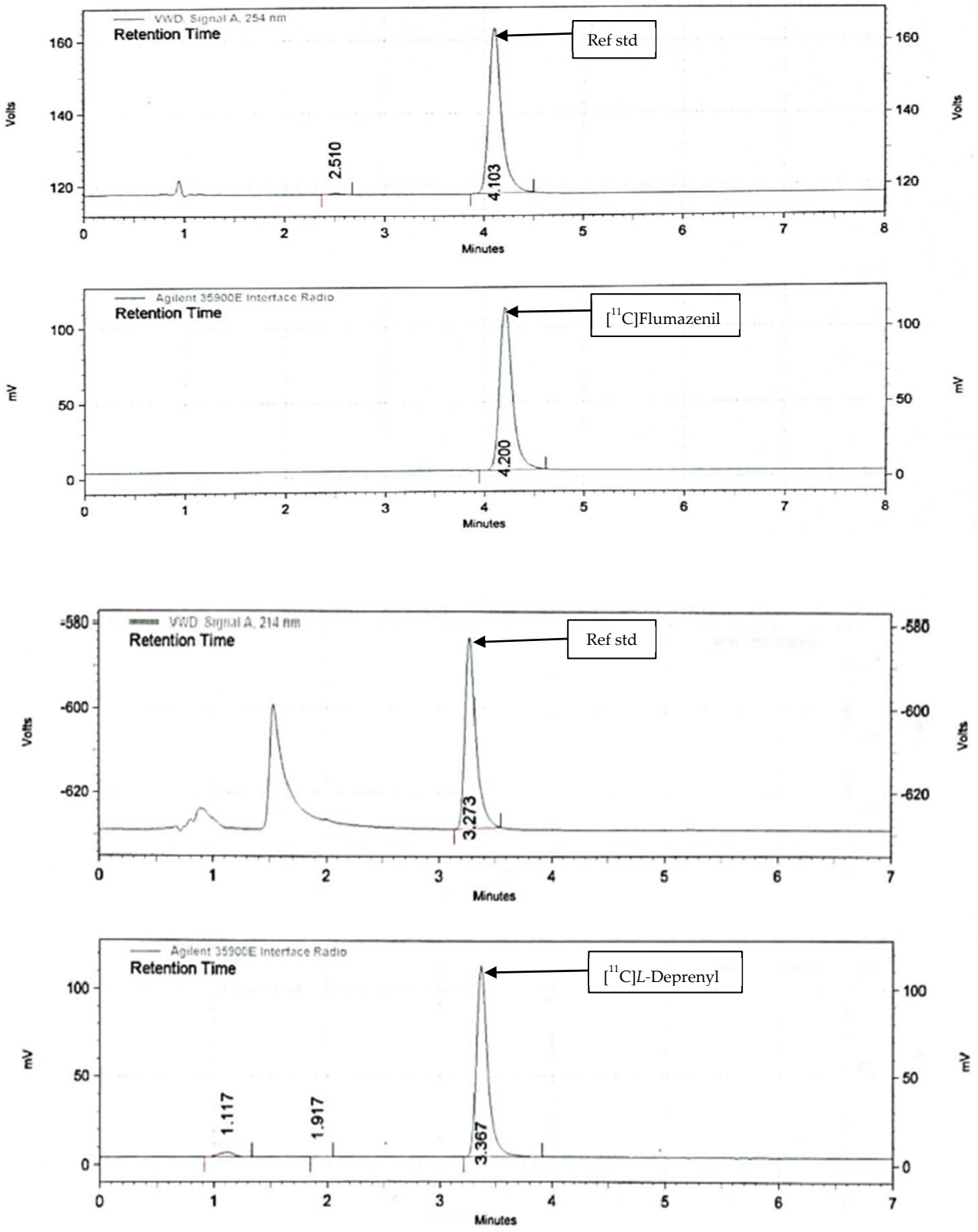


**Figure S2.** Analytical HPLC data of [$^{11}$C]flumazenil and [$^{11}$C]*L*-deprenyl.

**Table S1.** Methylating agents, solvents and bases used for [$^{11}$C]flumazenil synthesis.

| [$^{11}$C]Flumazenil synthesis | | | |
|---|---|---|---|
| Methylating agent | Solvent | Base | RCC (%) |
| [$^{11}$C]$CH_3OTf$ | Acetone/DEK | aq. NaOH | 0-20% |
| | Acetone | | |
| | DMF | | |
| | DMSO | | |
| [$^{11}$C]$CH_3I$ | MeOH and ACN | | |
| | DMSO | | |
| | DMF | | |
| | Acetonitrile | | |
| [$^{11}$C]$CH_3I$ | DMSO | KOH powder | 70% |
| | 1:1 mixture of DMSO/DMF | | 65-85% |

DEK- Diethyl ketone

DMF - Dimethylformamide

DMSO – Dimethyl sulfoxide

RCC-Radiochemical conversion

**Table S2.** Methylating agents, solvents and bases used for the [$^{11}$C]*L*-deprenyl synthesis.

| [$^{11}$C]*L*-Deprenyl synthesis | | | |
|---|---|---|---|
| Methylating agent | Solvent | Base | RCC (%) |
| [$^{11}$C]$CH_3OTf$ | MeOH and ACN | PMP | > 65% |
| | Diethyl ketone | aq. NaOH | None |
| [$^{11}$C]$CH_3I$ | 1:1 mixture of DMSO/DMF | KOH powder | None |
| | | PMP | |
| | DMF | $Cs_2CO_3$ | |
| | | NaH | |
| | | TBAH | |

$Cs_2CO_3$ - Cesium carbonate

NaH - Sodium Hydride

TBAH- Tetrabutylammonium hydroxide

PMP- Pentamethylpiperidine

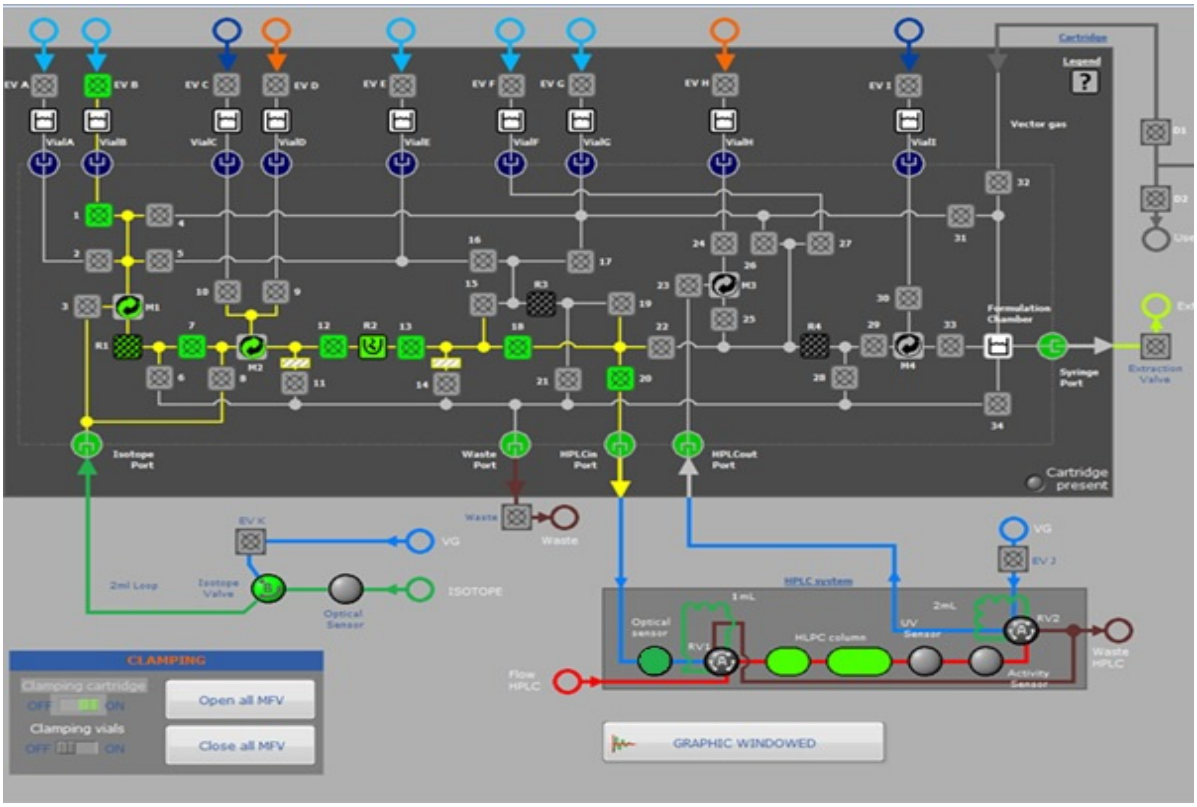


**Figure S3.** Semi-preparative HPLC injection from the vial B.

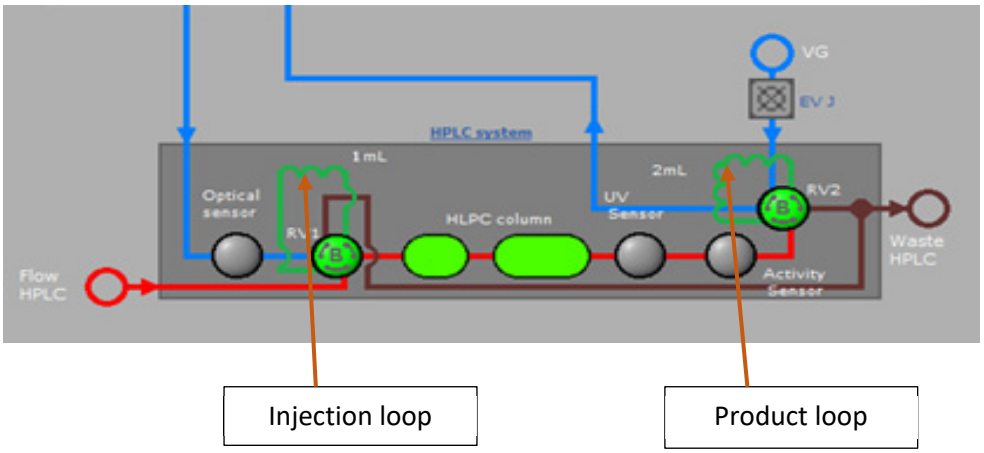


**Figure S4.** Semi-preparative HPLC purification (product collection) from the RV2 loop (position B).

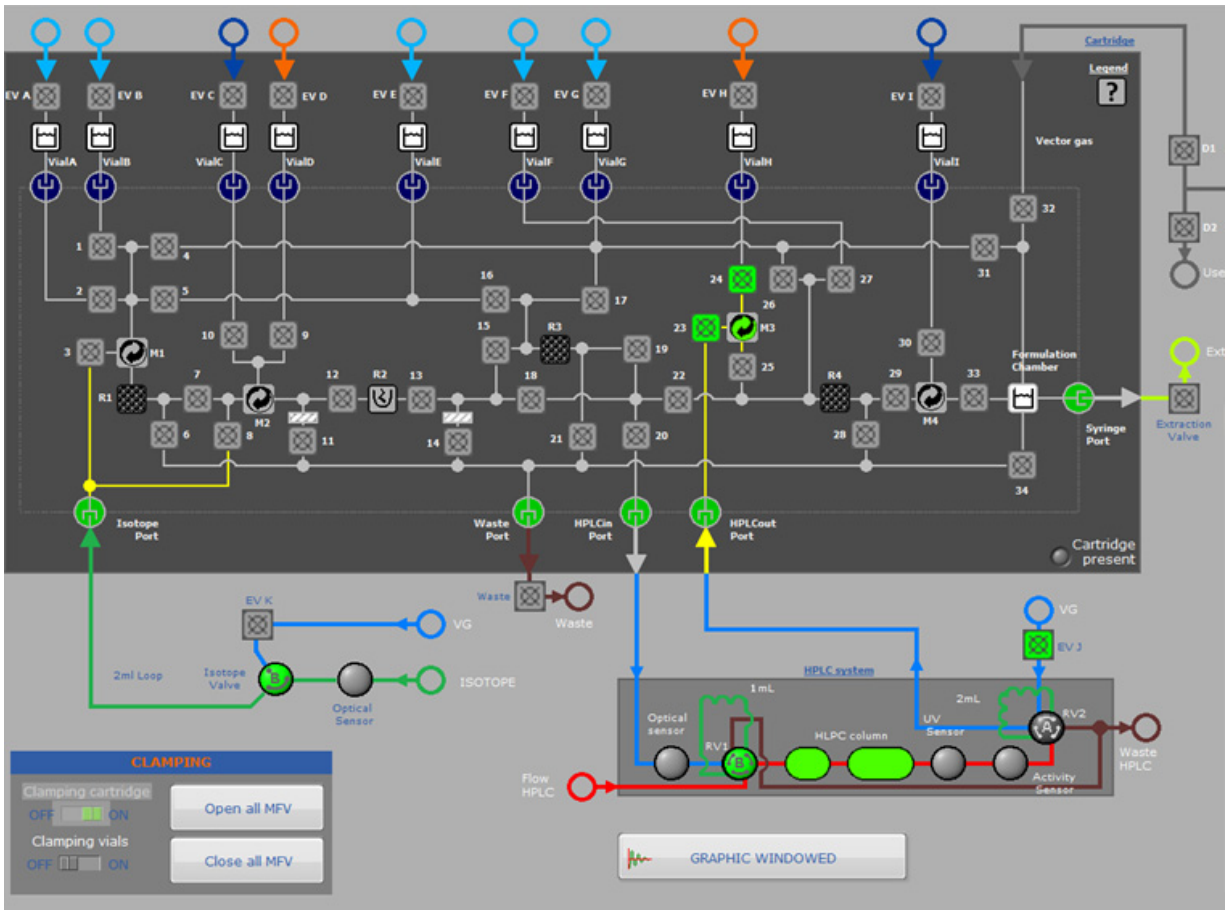


**Figure S5.** Pushing the product from the loop RV2 (Position A) to the vial H in the iMiDEV™ cassette.

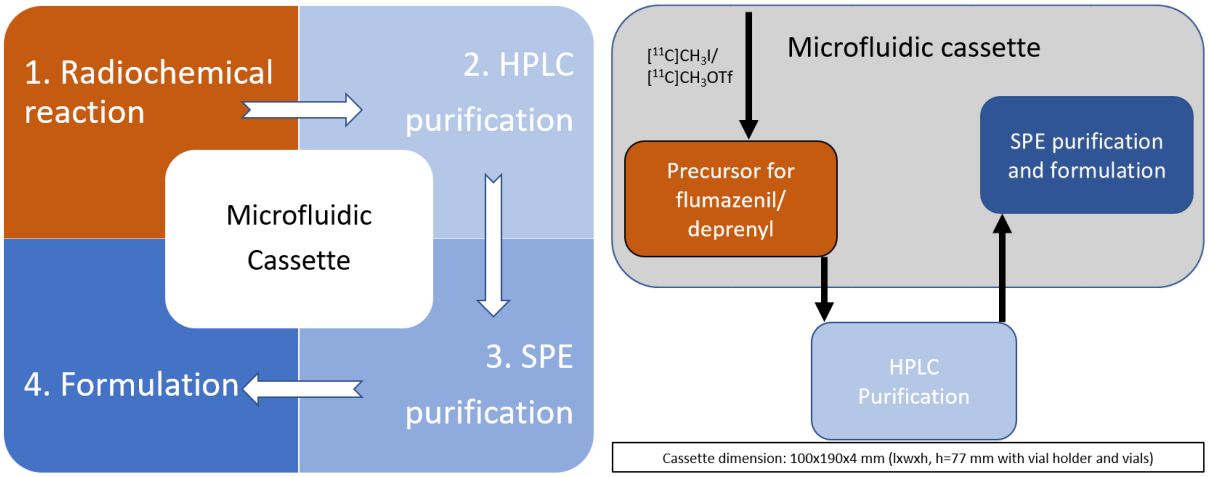


**Figure S6.** Flow chart of the synthesis steps performed on a microfluidic cassette.