

A Review of the work undertaken by the Ubichem Isotope Synthesis Group

The Ubichem Isotope Synthesis group was founded over 40 years ago by Dr. János Szammer. He has been involved in the synthesis of labelled compounds since 1963 and has over 50 scientific publications including 15 patents. Dr. Szammer is still working as a scientific advisor to Ubichem.

The group has a lot of experience in the synthesis of radioactive and stable labelled compounds involving ^{14}C , ^{13}C , ^3H , ^2H , ^{18}O , and ^{15}N isotopes. Syntheses start from commercially available labelled compounds. Typically for a ^{14}C -labelled product 10-20 mCi (10-50 mCi/mmol) are made. The labelled products are used in pharmacokinetic, metabolic and other biological studies in laboratories of pharmaceutical companies worldwide.

The team has experience in purification and separation by HPLC, TLC and column chromatography. NMR, MS and IR-spectroscopy are used to characterize the compounds.

Customers of the labelled products to date include pharmaceutical companies from Hungary, a variety of other countries across Europe, and Japan.

Since early 2010, Ubichem have been approved for the supply of cGMP radiolabelled active pharmaceutical ingredients (APIs), too.

Selected references

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Examples of compounds synthesized by the group

[¹⁴C]-Bisaramil and [D₅]-Bisaramil

3-methyl-7ethyl-9α-[4-chlorobenzoyloxy]-3,7-diazabicyclo/3.3.1./nonane-[6,8-¹⁴C₂] monohydrochloride and 3-methyl-7-[D₅-ethyl]-9α-[4-chlorobenzoyloxy]-3,7-diazabicyclo/3.3.1./nonane monohydrochloride - [Fig. 1](#).

[¹⁵N]-Glyceryl trinitrate and [1,3-¹⁴C₂]-glyceryl trinitrate labeled with quasi carrier free carbon-14 atom in the 1,3-positions - [Fig. 2](#).

[¹⁴C]-SCT-66 (7,8-methylenedioxy-14α-hydroxy-[¹⁴C]-*allo*-berbane) - [Fig. 3](#).

[¹⁴C]- and [³H]- labeled TP-4 (Arg-Lys-2-¹⁴C-Asp-Val and Arg-Lys-4,5-³H₄-Asp-Val) - [Fig. 4](#).

Deramciclone (2-phenyl-borneol-dimethylamino-ethyl-ether) labeled with carbon-14 in phenyl or ethyl group, tritium in position 3 of borneol skeleton or in the ethyl group and 6 deuterium in the dimethylamino group - [Fig. 5](#).

[¹⁴C]-Vintoperol {(-)-1β-ethyl-1α-(hydroxymethyl)-1,2,3,4,6,7,12,12bα-octahydro-indolo(2,3-a)quinolizine 6-¹⁴C} - [Fig. 6](#).

[¹⁴C]-SILA-336 {N-[(dimethyl-4-fluorobenzyl-7-¹⁴C-silyl)-piperidine hydrochloride - [Fig. 7](#).

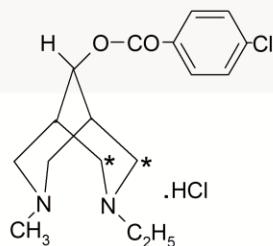
[³H]GHB (4-hydroxy-[2,3-³H]butyric acid) – [Fig. 8](#).

[³H]Cyclothiazide - [5-³H]-6-Chloro-3,4-dihydro-3-(5-norbornen-2-yl)-2H-1,2,4-benzothiadiazine-7-sulfonamide-1,1-dioxide) - [Fig. 9](#).

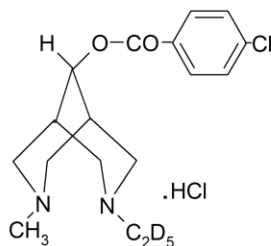
[³H]M-MPEP – (2-methyl-6-((3-[³H]methoxy)phenyl)ethynyl)-pyridine – Fig. 10.

[³H]R214127 - 1-(3,4-dihydro-2H-pyrano[2,3-b]quinolin-7-yl)-2-(phenyl-4-³H)-1-ethanone – Fig.11.

[¹⁴C]-Tolperison.HCl - 2-Methyl-1-(4-methylphenyl)-3-(1-piperidiny)-1-propanone-1-¹⁴C hydrochloride – Fig.12.



[¹⁴C]-Bisaramil



[D₅]-Bisaramil

Fig. 1.

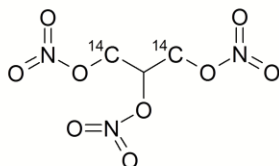


Fig. 2. [1,3-¹⁴C₂]Glycerol trinitrate

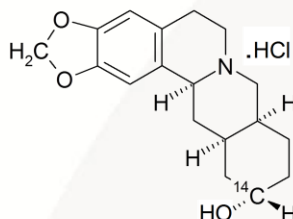


Fig.3. [¹⁴C]-SCT-66

Arg - [²⁻¹⁴C]Lys - Asp - Val

[¹⁴C]-TP-4

Arg - [4,5-³H₄]Lys - Asp - Val

[³H]-TP-4

Fig.4.

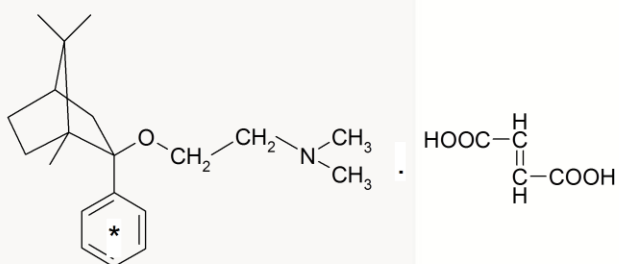


Fig.5. [¹⁴C]-Deramciclone

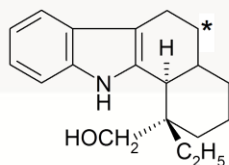


Fig.6. [¹⁴C]-Vintoprolol

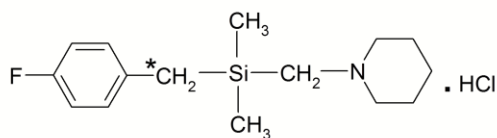


Fig. 7. [¹⁴C]-SILA-336

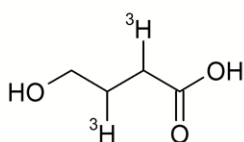


Fig. 8. [³H]-GHB

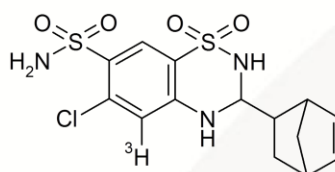


Fig. 9. [³H]-Cyclothiazide

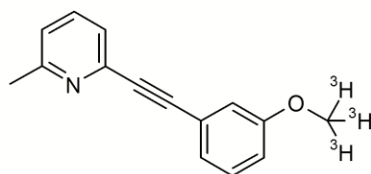


Fig. 10. [³H]-M-MPEP

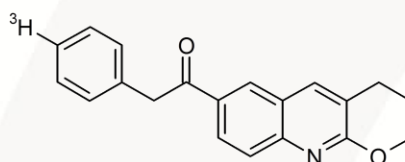


Fig.11. [³H]-R214127

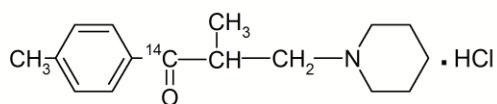


Fig.12. [¹⁴C]-Tolperison.HCl