**Hírlevél**

**MTA Szénhidrát, Nukleinsav és Antibiotikumkémiai Munkabizottság**

**2017. április**

1.) A 2017. évi munkabizottsági ülés időpontja: **2017. 05. 31. (szerda) - 2017. 06. 02. (péntek), Mátraháza**

Kérném a részvételi szándékot az alábbi táblázatban értelemszerűen jelölni ***vagy*** email címemre eljuttatni az igényelt szállást és étkezést. **Határidő: 05. 17.**

<https://docs.google.com/spreadsheets/d/1ZpyjpHT-SFxekwhIXQy4TDOGwsXTa165T5kTGxsJcjo/edit#gid=0>

Az előadások bejelentését a MB honlapján ***vagy*** emailben kérném megtenni. **Határidő: 05. 23.**

2.) Elkészítettem a munkabizottság honlapját a könnyebb információ áramlás végett. Igyekszem rendszeresen frissíteni.

Az alábbi linken elérhető:

<http://mta-szenhidrat-nukleinsav-es-antibiotikumkemiai-mu.mozello.hu/>

3.) A Munkabizottság tagjainak legújabb eredményei, megjelent közlemények kivonatai (a teljesség igénye nélkül):

**C-3 epimers of sugar amino acids as foldameric building blocks: improved synthesis, useful derivatives, coupling strategies**

Adrienn Nagy, Barbara Csordás, Virág Zsoldos-Mády, István Pintér, Viktor Farkas, András Perczel

*Amino Acids*, 2017, **49**, 223-240, DOI: 10.1007/s00726-016-2346-5

To obtain key sugar derivatives for making homooligomeric foldamers or α/β-chimera peptides, economic and multigram scale synthetic methods were to be developed. Though described in the literature, the cost-effective making of both 3-amino-3-deoxy-ribofuranuronic acid (H–t**X–**OH) and its C-3 epimeric stereoisomer, the 3-amino-3-deoxy-xylofuranuronic acid (H–c**X–**OH) from d-glucose is described here. The present synthetic route elaborated is (1) appropriate for large-scale synthesis; (2) reagent costs reduced (e.g. by a factor of 400); (3) yields optimized are ~80% or higher for all six consecutive steps concluding –t**X**– or –c**X**– and (4) reaction times shortened. Thus, a new synthetic route step-by-step optimized for yield, cost, time and purification is given both for d-xylo and d-ribo-amino-furanuronic acids using sustainable chemistry (e.g. less chromatography with organic solvents; using continuous-flow reactor). Our study encompasses necessary building blocks (e.g. –**X**–OMe, –**X–**OiPr, –**X**–NHMe, Fmoc–**X–**OH) and key coupling reactions making –Aaa–t**X**–Aaa– or –Aaa–t**X**–t**X**–Aaa– type “inserts”. Completed for both stereoisomers of **X**, including the newly synthesized Fmoc–c**X–**OH, producing longer oligomers for drug design and discovery is more of a reality than a wish.

# Origin of problems related to Staudinger reduction in carbopeptoid syntheses

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*Amino Acids*, 2016, **48**, 2619-2633, DOI: 10.1007/s00726-016-2289-x

We report the solid phase synthesis of –GG-**X**-GG– type α/β-carbopeptoids incorporating RibAFU(ip) (**1a**, tX) or XylAFU(ip) (**2a**, cX) sugar amino acids. Though coupling efficacy is moderate, both the lengthier synthetic route using Fmoc derivative (e.g., Fmoc-RibAFU(ip)-OH) and the azido derivative (e.g., N3-RibAFU(ip)-OH) via Staudinger reaction with nBu3P can be successfully applied. Both X-ray diffraction, 1H- and 31P-NMR, and theoretical (QM) data support and explain why the application of Ph3P as Staudinger reagent is “ineffective” in the case of a cis stereoisomer, if cX is attached to the preceding residue with a peptide (–CONH–) bond. The failure of the polypeptide chain elongation with N3-cX originates from the “coincidence” of a steric crowdedness and an electronic effect disabling the mandatory nucleophilic attack during the hydrolysis of a quasi penta-coordinated triphenylphosphinimine. Nevertheless, the synthesis of the above α/β-chimera peptides as completed now by a new pathway via 1,2-O-isopropylidene-3-azido-3-deoxy-ribo- and -xylo-furanuronic acid (H-RibAFU(ip)-OH **1a** and H-XylAFU(ip)-OH **2a**) coupled with N-protected α-amino acids on solid phase could serve as useful examples and starting points of further synthetic efforts.

**Synthesis and in vitro investigation of potential antiproliferative monosaccharide–D-secoestrone bioconjugates**

Bodnár, B.; Mernyák, E.; Szabó, J.; Wölfling, J.; Schneider, G.; Zupkó, I.; Kupihár, Z.; Kovács, L.

*Bioorg. Med. Chem. Lett.* (2017) **27**, (9), 1938-1942. DOI: [10.1016/j.bmcl.2017.03.029](http://doi.org/10.1016/j.bmcl.2017.03.029)

**Abstract**

The syntheses of monosaccharide-d-secoestrone conjugates are reported. They were prepared from 3-(prop-2-inyloxy)-d-secoestrone alcohol or oxime and monosaccharide azides via Cu(I)-catalyzed azide-alkyne cycloaddition reactions (CuAAC). The antiproliferative activities of the conjugates were investigated in vitro against a panel of human adherent cancer cell lines (HeLa, A2780 and MCF-7) by means of MTT assays. The protected d-glucose-containing d-secoestrone oxime bioconjugate (24b) proved to be the most effective with an IC50 value in the low micromolar range against A2780 cell line.

5.) **Programajánló**

Az MTA-n Oláh György emlékülés lesz 2017. május 3-án. A meghívó és a program a csatolmányban található.

*A havi rendszerességű hírlevélben megjelentetni kívánt anyagot kérjük minden hónap utolsó napjáig elküldeni a* [*csavas.magdolna@science.unideb.hu*](mailto:csavas.magdolna@science.unideb.hu) *email címre.*

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2017. április 25.