

Thermodynamic surprises of Cu(II)-amylin analogue complexes in membrane mimicking solutions.

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Streszczenie

Membrane environment often has an important effect on the structure, and therefore also on the coordination mode of biologically relevant metal ions. This is also true in the case of Cu(II) coordination to amylin analogues—rat amylin, amylin_{1–19}, pramlintide and Ac-pramlintide, which offer N-terminal amine groups and/or histidine imidazoles as copper(II) anchoring sites. Complex stabilities are comparable, with the exception of the very stable Cu(II)–amylin_{1–19}, which proves that the presence of the amylin C-terminus lowers its affinity for copper(II); although not directly involved, its appropriate arrangement sterically prevents early metal binding. Most interestingly, in membrane-mimicking solution, the Cu(II) affinities of amylin analogues are lower than the ones in water, probably due to the crowding effect of the membrane solution and the fact that amide coordination occurs at higher pH, which happens most likely because the α -helical structure, imposed by the membrane-mimicking solvent, prevents the amides from binding at lower pH, requiring a local unwinding of the α -helix.

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