Title: **Design and synthesis of assembled peptide amphiphiles with possible application in the preexposure prophylaxis (PrEP) of HIV-1 infection.**

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Human Immunodeficiency Virus (HIV) is the causative agent of the Acquired Immunodeficiency Syndrome (AIDS), one of the final stages of contagion, in which the immunological system is deteriorated. Therefore, an opportunistic infection could occur being able to cause the death of the patient.

Previous studies have stablished a direct relation between GB virus C (GBV-C) infection and inhibition of HIV-1 replication. In the research group USiBAP, from IQAC-CSIC, an 18 amino acid peptide sequence derived from GBV-C has been described. It presents activity against HIV-1 infection. This peptide is known as E1P47. Some studies, around this structure, are being carried out in order to improve its pharmacological properties and a possible application as an inhibitory drug for HIV-1.

For this purpose, two novel peptide amphiphiles (PA7 and PA8) derived from E1P47, were synthesized, purified and characterized, by fluorescence measurements. Those PAs are constituted by E1P47 bonded to a polyethylene glycol spacer which has a molecular weight of 1500 g mol. In the compound named PA7, an alkyl tail was chained to it ($CH_3(CH_2)_y$-). On the other hand, in the compound named PA8, a dialkyllic tail of this type ($CH_3(CH_2)_y$-)$_2$ was linked.

A tryptophan intrinsic fluorescence assay was performed to E1P47, PA7, PA8 and two PAs which were previously synthesized by the group, PA4 and PA5. It was demonstrated that: the peptide sequence is less accessible in PA8 since a higher blue-shift was observed. A dependence on time was also observed in the formation of self-assembled supramolecular structures. Moreover, the presence of dissolved salts can influence in the formation of these aggregates.

Therefore, future studies are needed in order to know, with more accuracy, if synthesized PAs have increased its anti-HIV activity and also, to know the principal factors that can influence on the formation of these supramolecular aggregates.

Keywords: Peptide synthesis, Peptide amphiphiles, E1P47, HIV-1, PEG spacer, Intrinsic tryptophan fluorescence.