Title: **Solid-phase synthesis of a nonapeptide.**

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Date: June 2018

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Nowadays there is an increased interest for peptides in pharmaceutical research and development (R&D), so much so there are approximately 140 potentially therapeutic peptides being evaluated in clinical trials. That is because peptides are highly selective, efficacious, relatively safe and well tolerated.

My project has been carried out in a research group whose aim is to synthesise a biologically active peptide in order to seek for conditions suitable to scale up the process for pilot plant production. The synthesis of this peptide must be approached using a convergent synthesis scheme since the linear synthesis did not succeed.

A protected fragment of the aforementioned peptide containing 9 amino acid residues has been synthesised by the solid-phase methodology following a Fmoc/^{t}Bu protection scheme (0.55 mmol and 1.1 mmol scales). The solid support employed has been 2-CTC (1.1 mmol/g) and the coupling reagent used has been the carbodiimide DIC in the presence of HOBt as an additive. Characterization of the target product has been performed by HPLC-MS using a C18 reverse-phase column.

Furthermore, the C-terminal protected fragment of the target peptide consisting of a dipeptide has been also synthesised in this work, in order to perform a preliminary study of the coupling of the nonapeptide to the dipeptide in solution. The protected dipeptide has been prepared in solution and has been purified by flash column chromatography. The product has been characterized by HPLC-MS and NMR. To test the coupling between both peptides, two assays have been performed using different coupling reagents, EDC/HOAt and HATU, being the latter the best since it afforded less racemization and a higher yield.

Keywords: nonapeptide, convergent synthesis, HATU, SPPS, solution-phase peptide synthesis, protected peptide.