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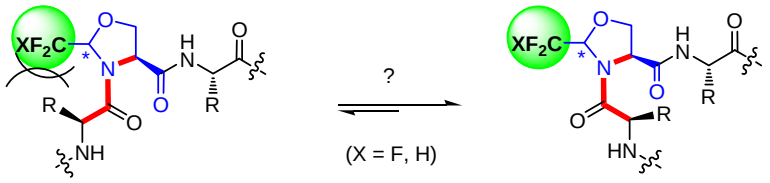
Grégory Chaume received a PhD degree in 2003 from the University of Cergy-Pontoise (UCP) under the co-direction of the Prof. J. Ardisson and the Dr A. Pancrazi working on the total synthesis of the griseoviridin, a streptogramin antibiotic. He then moved at Nottingham University for a postdoctoral position in the group of Prof. G. Pattenden where he contributed to the total synthesis to the Ulapualide A. After an ATER position at UCP under the supervision of Prof. T. Brigaud, he was recruited in 2005 as permanent associate professor at the UCP. His research interests are mainly focused on the synthesis of fluorinated biomolecules, including amino acids, peptides and peptidomimetics, and their biophysical and biological studies.

Fluorinated Pseudoprolines as original tools for conformational control of peptide chains

The design of constrained peptides is of prime importance in the development of bioactive compounds and for applications in supramolecular chemistry. Due to its nature, the peptide bond undergoes a spontaneous *cis*–*trans* isomerism, and the *cis* isomers are much more difficult to stabilize than the *trans* forms. To constrain the amide bond conformation, numerous alkyl-substituted pyrrolidine rings have been introduced as proline surrogates in Xaa-Pro sequences.[1] While they have almost no effect at the C^{β} and C^{γ} positions, C^{α} and C^{δ} alkylations lead to a strong preference for the *trans* and *cis* isomers, respectively.[2] Furthermore, comprehensive studies on pseudoproline (ΨPro) surrogates have shown that changing the substituent nature, its configuration or the degree of substitution at the C^{δ} position tuned the *cis*/*trans* isomer ratio.[3]
Our group is interested in the development of efficient routes for the preparation of enantiopure fluorinated amino acids [4] and their incorporation into a peptide chain.[5] In particular, we have reported several studies based on CF_3-pseudoprolines (CF_3-ΨPro) model peptides which established the stereoelectronic effects imparted by the CF_3 group at the C^{δ} position.[6] Very recently, we have also been interested in the synthesis of CF_2H-pseudoprolines (CF_2H-ΨPro). Here, I will report the preparation of fluorinated pseudoprolines as well as the methodological study developed to optimize their incorporation into peptides. Conformational studies as well as application to collagen model peptides will be shown.



***trans*-prolyl amide bond** ***cis*-prolyl amide bond**

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