



Secteur des Sciences
et Technologies

Invitation à la soutenance publique de thèse de
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Master of Medicine

Pour l'obtention du grade de Docteur en sciences

« Exploring pharmaceutical ionic cocrystals of chiral racetams : from
discovery to crystallization »

qui se déroulera
le vendredi 21 août 2020 à 10h
Auditoire A03 SCES
Place des Sciences
1348 Louvain-la-Neuve

Jury members :

Prof. Tom Leyssens (UCLouvain), supervisor
Prof. Eric Gaigneaux (UCLouvain), chairperson
Prof. Michael Singleton (UCLouvain), secretary
Dr. Koen Robeyns (UCLouvain)
Prof. Fabrizia Grepioni (Univ. di Bologna, Italy)
Dr. Luc Aerts (UCB Pharma S.A., Belgium)



The racetam family of compounds are active pharmaceutical ingredients (APIs) used for the treatment of neurological disorders. Most APIs of this family show low melting points which render them less ideal for formulation. Cocrystals provides an attractive approach to improve their properties in the solid state by linking the target compound with another pharmaceutically acceptable component in a stoichiometric ratio through non-covalent bonding. Ionic cocrystals, an important subclass of cocrystals, are presented in this work using inorganic salts such as CaCl_2 , MgCl_2 and ZnCl_2 as conformer. The aim of the present thesis is the identification of ionic cocrystals of racetams, from discovery, analysis of characteristics to upscaling of the crystallization process.

A large number of ionic cocrystals are discovered showing improved thermal stability with respect to pure drugs. The full characterization is performed by powder/single crystal/variable temperature X-ray diffraction, thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). Moreover, the importance of chirality in the ionic cocrystals, the homochiral preference in crystal packing and conglomerate formation are investigated. At last, a new strategy for the design of ternary ionic cocrystals is proposed with the ultimate aim of cocrystallizing two drugs without direct connection.