P11 Solubility control of theobromine *via* cocrystal formation

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A recent estimate indicated that ~70% of the most promising active pharmaceutical compounds (APIs) under development may fail due to solubility problems. The development of techniques to improve the solubility of an API without its chemical modification is, therefore, a pressing issue of major interest to the pharmaceutical industry. In the last decades, several approaches have been explored to address this problem, many of them involving the modification of the crystal structure of the substances. Among these, the use of co-crystals (the formation of crystals containing more than one molecule in the crystal lattice) is one of the most promising approaches.
This work describes the use of co-crystals to improve the solubility of the API theobromine (Figure 1), which is currently used e.g., as a heart stimulant, and to control fatigue and orthostatic hypotension. Co-crystallization was performed by mechanochemistry mixing the compound with hydroxybenzoic acids. The obtained mixtures were characterized by powder X-ray diffraction and differential scanning calorimetry. Finally, the solubility of the cocrystals was evaluated and compared with that of pure theobromine.

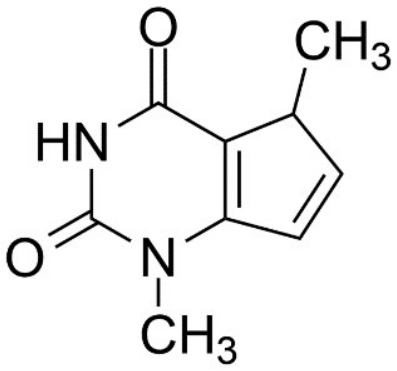

Figure 1. Chemical structure of theobromine.

Acknowledgments: Centro de Química Estrutural is a Research Unit funded by Fundação para a Ciência e Tecnologia (FCT) through projects UIDB/00100/2020 and UIDP/00100/2020. Institute of Molecular Sciences is an Associate Laboratory funded by FCT through project LA/P/0056/2020. This research was also supported by project PTDC/QUI-OUT/28401/2017 (LISBOA-01-0145-FEDER-028401).