

PAID DIPLOMA / MASTER'S THESIS

INVESTIGATING THE FEASIBILITY OF RECYCLING ACTIVE PHARMACEUTICAL INGREDIENTS (API)

Ref. No. DA182

To dedicated students of pharmaceutical sciences, environmental systems sciences, chemistry, biotechnology, process engineering, chemical and pharmaceutical engineering with interdisciplinary interests.

Objective

In today's society, we are used to the recycling of materials, ranging from glass, to paper, plastics and metals. However, medicines or drugs, which contain valuable active pharmaceutical ingredients (APIs), are not recycled anywhere in this world – although a massive amount of valuable materials are wasted, ranging from expired products in pharmacies, and Out-of-Spec (OoS) materials in manufacturing processes. In addition, many production batches fail to meet strict quality standards in production, and hence, are required to be discarded, leading to the loss of valuable APIs that have undergone complex multistep synthesis processes. At the same time, Europe is facing a shortage of many medicines, including anti-infective, cancer drugs and pain medicines. Moreover, offshoring of API production to the far East (China, etc.) has made Europe highly dependent on these countries, threatening medical safety, as essential APIs are becoming increasingly unavailable or unaffordable due to disrupted supply chains (e.g., during recent pandemic events and geopolitical tension).

This thesis aims at assessing the needed framework towards recycling of APIs and consists of:

- Analysis of the regulatory and legal framework for API recycling including the regulatory landscape of Austria (set by the AGES) and the EU (set by the EMA)
- Analysis and estimation of occurring APIs in waste streams, including the expected type and amount of materials together with industrial partners from our network
- Classification of these APIs according to their value, social importance as well as physicochemical properties to establish a recycling strategy
- Definition of target APIs with high potential to be successfully recycled and proposition of suitable process routes together with pharmaceutical engineering experts at RPCE

Within the framework of this diploma / master's thesis we offer the following

- Extensive participation in a top-level and industrially relevant research project in an international environment
- Supervised training in the task
- Assistance of experienced staff with the implementation of innovative ideas
- Access to highly modern infrastructure on campus of Graz University of Technology
- Assistance with the publication of results

Financing

- Compensation on the basis of a service contract

If you are interested in writing your thesis at the interface between university research and industry/ business and to contribute to the optimization of product and process development in the pharmaceutical industry, please apply directly via our website.

Contact

<https://careers.rcpe.at/>

