Bachelor’s/Master’s Thesis

Design of liquid-liquid chromatography processes for the separation of cannabinoids from hemp (Cannabis sativa) extracts

Liquid-liquid chromatography (LLC), commonly referred to as centrifugal partition chromatography (CPC) or countercurrent chromatography (CCC), is a versatile and highly adaptable preparative separation technique that combines the sample loading capacities of liquid-liquid extraction with the selectivity of solid-liquid chromatography. In LLC, the mobile and stationary phases are the two phases of a liquid-liquid biphasic system. Either phase (upper or lower phase) may be used as the stationary phase, and the roles of the phases may be switched in during operation. This characteristic has led to the development of several operating modes unique to LLC, such as the continuous sequential centrifugal partition chromatography (sCPC) or trapping multiple dual mode (MDM) processes.

This thesis will focus on the LLC purification of major cannabinoids (cannabidiol, CBD) and minor cannabinoids (cannabigerol, CBG; cannabinochromene, CBC) from hemp (Cannabis sativa) extracts. Various biphasic solvent systems, operating parameters (feed concentration, injection volume, flow-rate) and operating modes (batch, trapping MDM, sCPC) will be evaluated in order to maximize the cannabinoids’ productivity.

Methods and devices:

- Centrifugal partition chromatography (CPC)
- Countercurrent chromatography (CCC)
- High performance liquid chromatography (HPLC)

Requirements:

The student should be highly motivated, organized, and able to work independently. Prior experience in HPLC and CCC/CPC is not required.

Start: Immediately.

Contact: Dr. Pharm. Vlad LUCA
Maximums-von-Imhof-Forum 2, 1. OG 009
Tel.: 8161.71.6166
E-Mail: vlad.luca@tum.de