



PhD position in Organic Chemistry “Continuous flow synthesis of fluorescence reagents”

A four year PhD position (€16,000 per annum, full annual tuition fees, consumable budget, and travel budget) is available at the Department of Chemistry, Maynooth University to develop the continuous flow synthesis of valuable fluorescence quencher reagents.

The successful candidate will join the research group of Prof. John Stephens (<https://www.maynoothuniversity.ie/people/john-stephens>). Research at the Stephens Group is focused on the discovery and application of new technologies, such as continuous flow synthesis, at the interface of chemistry & biology. Partnering with industry is also an important aspect of their work (AF Chempharm, Dual Systems, Dairygold Ingredients, Connolly’s Red Mill). “Hot” project areas where they enjoy significant success include antidiabetic agent discovery and synthetic methodology development, including a collaboration on continuous flow synthesis with the Jamison Group at MIT, USA (Synlett 2020, DOI:10.1055/s-0039-1690884).

Project

This project aims to develop a new high yielding and efficient continuous flow synthesis of fluorescence quencher dyes. Such fluorescence quenchers are both important and valuable molecules (in some cases 400 times the value of gold) and are used in quantitative polymerase chain reaction (qPCR) based tests, including COVID-19 testing. Current reported synthetic strategies are low yielding batch processes, require the use of cold temperatures to control the exothermic reactions, and employ reactive species.

Continuous flow technologies are becoming increasingly popular in industrial and academic sectors. The use of flow reactors over batch synthesis, offers several benefits including enhanced heat and mass transfer, reproducibility, scale-up, automated operation, in-line work-up, and improved safety profile. Reactions that are highly exothermic have the tendency to generate hot spots, accumulate heat and can be problematic when employing batch technologies. The use of continuous flow approaches can address these challenges.

Candidate

We are seeking a candidate with a first or upper-second class (1.1. or 2.1) BSc Honours degree in a Chemistry subject, who is highly self-motivated with a strong background in synthetic chemistry.

Application

Applicants should submit a curriculum vitae (including contact details for two academic referees) and cover letter detailing qualifications and experience by email to Prof. John Stephens - Email: john.stephens@mu.ie

For further information, contact Prof. John Stephens at john.stephens@mu.ie