Development of quantitative in situ and spatial tissue metabolite profiling methods for clinical applications

**Project Supervisors:** Dr Dong-Hyun Kim, Dr Rian Griffiths, Dr Sandra Martinez

The School of Pharmacy at the University of Nottingham seeks an enthusiastic PhD candidate to work on an exciting PhD project that brings together analytical science and brain cancer research.

This 3.5-year PhD project is funded by EPSRC and students will benefit from a training in a range of widely applicable analytical techniques, including Orbitrap secondary ion mass spectrometry (OrbiSIMS), liquid extraction surface analysis-MS (LESA-MS), nano-liquid chromatography-MS (nanoLC-MS) and chemometrics/machine learning for metabolomics approaches.

The research team has recently developed the advanced mass spectrometry analysis using OrbiSIMS and LESA-MS to predict brain tumour recurrence ([Meurs et al, Anal. Chem. 2021](#)) and to characterise intra-tumour heterogeneity ([He et al, Anal. Chem. 2023](#)). This project builds upon the previous work and takes it a step further by developing an advanced in situ and spatial tissue metabolite profiling method using isotopically labelled internal standards. This enhanced technique will be applied to glioblastoma (GBM) tissues for metabolite profiling to identify potential therapeutic targets. A variety of machine learning and multivariate/pathway analysis approaches will be employed to identify key metabolites and metabolic pathways.

**Deadline:** 30th July 2023 for an October 2023 start.

For further information about this studentship, please contact Dr Dong-Hyun Kim ([dong-hyun.kim@nottingham.ac.uk](mailto:dong-hyun.kim@nottingham.ac.uk))

To find out how to apply for a pharmacy PhD, please click [here](#).

**Key words:** Surface mass spectrometry, OrbiSIMS, LESA, LC-MS, metabolomics, metabolite profiling, GBM, brain cancer, machine learning

**Funding notes:** This 3.5-year PhD studentship will include tuition fees for home students and an annual stipend equivalent to current Research Council rates.

**Eligibility:** This opportunity is available with stipend and fees payable to UK candidates.