

Exploring the link between gut microbes and bowel cancer progression

Lead supervisor: [Dr Nicholas Peake](#)

Co-supervisor(s): [Professor David Smith](#)

School/Institute: [Biosciences and Chemistry](#)

Contact for applicant queries: Dr Nick Peake n.peake@shu.ac.uk

Project summary

Bowel cancer is the 3rd most common cancer in the world, and the 2nd biggest cause of cancer-related deaths. Worryingly, it is increasing amongst younger people (< 55 years), and it is increasingly clear that this is somehow related to changes in the bacteria that live in our gut. Our research team has found that tiny particles produced by bowel cancer cells (called vesicles) can cause how bacteria behave. We have evidence that these particles could make some bacteria grow faster and behave in ways that help cancers to grow and spread.

In this project, we want to develop this idea. Based on our existing data looking at genetic profiling, there are 2 potentially important leads. Firstly, we have identified a possible way in which genetic regulation is transferred by vesicles into bacteria. Secondly, we have identified that genes regulating certain metals are altered. For this project, we will measure the metal content of vesicles to assess whether this is important, and we'll treat *e. coli* with vesicles so that we can look at genetic regulation.

The internship will develop laboratory skills in bowel cancer cell biology, and in microbiology, and gain experience in how bioinformatics (analysis of genetic regulation) is used to design these types of experiments. Most of all, the intern would gain an understanding of how microbes and human cells interact, and how this might be linked to bowel cancer. Eventually, this knowledge could be leveraged for better management of bowel cancer (for example through specific antimicrobial treatment) in the future.

Specific skills and experience required for this project

Please also refer to the advert on our jobs pages for the person specification for these internships

The intern recruited to this project should be undertaking a biological sciences degree (for example, biomedical science, biochemistry or biomedicine and health science). They should have developed basic laboratory skills (such as preparation of stock solutions, applied laboratory mathematics, accurate pipetting technique), and any experience of handling bacteria would be useful. Good record keeping is essential. During the project, you'll expand on these skills to develop more specific biochemical, bioanalytical and molecular biology techniques such as size-exclusion chromatography (to purify vesicles), ICP-mass spectrometry (to measure metals) and miRNA inhibition (to alter gene expression). The intern would therefore broaden their laboratory techniques base, providing them with experience suitable for progression towards PGR study in future.

Project location

City Campus

Project delivery

This project can be delivered on a full-time or part-time basis