Project title:

Developing Molecular Radiotherapy for Prostate Cancer.

Project Summary:

Molecular radiotherapy (MRT) also known as 'radiotheranostics' uses radiopharmaceuticals that target tumour cells specifically and minimises radiation dose to normal tissues thereby enhancing efficacy and minimising side effects- a basis for precision medicine. In prostate cancer MRT treatments which targets the prostate-specific membrane (PSMA) receptor, such as beta-emitting lutetium-177 (^{177}Lu)Lu-PSMA-617, alpha-emitting actinium-225 (^{225}Ac)Ac-PSMA-617, together with Radium-223 which targets the bone matrix within osteoblastic metastatic lesions, have been shown to improve quality of life and survival for patients with metastatic disease who have progressed on systemic treatment.

Active areas of research in MRT for prostate cancer include defining optimal patient selection, optimum dosimetry, extending its use to earlier stages of the disease and exploring the feasibility of rechallenging with PSMA therapy.

This PhD research will look at addressing some of these unmet needs, and in particular focus on developing and establishing innovative technology using intra-tumoral [^{177}Lu]Lu-PSMA, which is being developed at Imperial College. One of the main projects for the student will be exploring the **F**easibility of **I**ntratumoral [^{177}Lu] **L**u-PSMA **T**herapy as an **E**merging **R**adioisotope therapy for prostate cancer (FILTER), for which commercial funding will be sought.

Supervisory Team:

This is a clinical project that will be of interest primarily to radiation oncologists, supervised by Dr Mangar recruiting patients from his uro-oncology clinics. However, this study will be supported from a multidisciplinary team of leading researchers including Professor Eric Aboagye at the CRUK-EPSRC-MRC-NIHR Comprehensive Cancer Imaging Centre, who is involved in developing novel radioligands for prostate cancer, together with Professor Tara Barwick and her team at Imperial College looking at hybrid imaging techniques with SPECT/CT and PET/CT. In addition, the candidate will also work closely with the academic urology team at Imperial with Professor Hashim Ahmed and Mr Taimur Shah.

Clinical Specialities:

This will be a collaborative initiative between Dr Mangar- **Clinical oncology,** Professor Eric Aboagye and Professor Tara Barwick,- **Cancer imaging.**

They have the support of the broader multidisciplinary team including **Medical physics** (Chloe Bowne) and **Urology** (Professor Taimur Shah, Professor Hashim Ahmed) .


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