

## UCL-MIRO RADIOCHEMISTRY-RADIOPHARMACY

The centre of Molecular Imaging, Radiotherapy, and Oncology (MIRO) includes a GMP-certified lab and a radiochemistry team that carries out the synthesis of radiotracers labelled by positron emitter isotopes, which are involved in positron emission tomography (PET). These isotopes are: fluorine-18, carbon-11, nitrogen-13, produced in an IBA 18/9 cyclotron, as well as zirconium-89, produced in an IBA Cyclone 30. The team's role is initially logistic with the synthesis of radiopharmaceuticals known for their potential in PET imaging.

### Research axes & expertise

The radiopharmaceutical tracers that are routinely prepared are: [<sup>18</sup>F]-FAZA (hypoxia), [<sup>18</sup>F]-FLT (proliferation), [<sup>18</sup>F]-fluorocholine (phospholipids in the cell membranes), [<sup>18</sup>F]-NaF (bones), [<sup>18</sup>F]-FPA (lactate) and [<sup>18</sup>F]-FHBG (expression of the herpes simplex virus type-1 thymidine kinase (HSV1-tk) gene), [<sup>11</sup>C]-methionine (cerebral tumor), and [<sup>11</sup>C]-acetate (liver). All of them are used in pre-clinical studies for in-vivo characterization of different pathologic models. [<sup>18</sup>F]-FAZA is prepared in GMP conditions and used for clinical trials.

### Application fields

For pre-clinical studies, all tracers are prepared with remote control systems that are designed in-house and driven by NI LabVIEW software. GMP syntheses are performed in clean rooms by fully automated systems that are developed and piloted by NI LabVIEW software.

### Major projects/partnerships/collaborations

Beyond logistical activities, the radiochemistry team is also involved in fundamental research. A first topic focuses on the production of high specific activity <sup>89</sup>Zr (T 1/2: 78,4 h) for monoclonal antibodies labelling. A second research area is the synthesis of silicon analogues of [<sup>18</sup>F]fluoromisonidazole in order to develop new radio-labelled compounds for the detection of tumor hypoxic domain.

### Key figures

Production of GMP-grade tracers for clinical investigations, development of new tracers using <sup>18</sup>F, <sup>11</sup>C, <sup>89</sup>Zr, <sup>64</sup>Cu, <sup>68</sup>Ga, <sup>99m</sup>Tc, among others.

### Contact

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