PRISMAP+

Medical-Radionuclides.eu

Radiopharmaceutical Sciences Laboratories of IST-ID (RS/IST-ID) Bobadela, Portugal

Development and preclinical evaluation of innovative molecules and nanoparticles containing radioactive isotopes for Molecular Imaging (PET and SPECT), Targeted Radionuclide Therapy, and Cancer Theranostics

PRISMAP+ Biomedical Facility IST-ID

The RS/IST-ID facilities are located in the Technological and Nuclear Campus of Instituto Superior Técnico, Universidade Lisboa near Lisbon. These facilities provide conditions to explore the use of radionuclides in the design, development and preclinical evaluation of innovative molecules and nanoparticles containing radioactive isotopes for Molecular Imaging (PET and SPECT), Targeted Radionuclide Therapy and Cancer Theranostics.

The research activities, with a strong multidisciplinary character, are undertaken by a team of scientists with expertise in various scientific disciplines related to the development and preclinical evaluation of radiopharmaceuticals, including chemistry, radiochemistry, biology and pharmaceutical sciences; supported by a set of dedicated facilities licensed for handling a wide range of radionuclides.

The radionuclides from the PRISMAP portfolio that are already approved in the RS/IST-ID biomedical facility are listed in Table 1. Additional radionuclides can be made available upon request but the approval procedure will take some time.

Table 1. Radionuclides from the PRISMAP+ portfolio that can be used at the RS/IST-ID facility.

Radionuclide	Max. Activity, MBq	Remarks
Cu-61	5.5	
Cu-64	5.5	
Cu-67	5.5	
Ga-67	4.4	
La-135	4.4	
Sm-153	44.4	
Tb-155	4.4	
Er-165	4.4	
Ho-166	37	
Er-169	4.4	
Ac-225	0.37	

Infrastructure and experiments available

The RS/IST-ID facility is fully equipped to conduct radiolabelling and preclinical characterization of radiolabelled compounds, including purification, radiochemical characterization and stability studies. Preclinical evaluation includes cellular (2D and 3D cancer cellular models) and animal studies (different strains of normal mice and immunodeficient mice models).

Several cellular studies are available (uptake, subcellular localization, radiobiological assays). Animal studies comprise biodistribution, pharmacokinetics, in vivo stability and radionuclide therapeutic efficacy assays.

Multidisciplinary team of researchers that can support the main steps of the development and preclinical evaluation of a potential radiopharmaceutical; access to the following dedicated facilities:

- **Laboratories for Radiosynthesis** (Main equipment: hot cells, glove boxes and fume hoods for the safe handling of various radionuclides; RP-HPLC systems coupled to UV-vis and Gamma Detectors, a Thin Layer Chromatography Scanner and an Electrophoresis Apparatus for the characterization and chemical identification of radioactive compounds; radiation monitors, dose calibrators and gamma counters for safety control and measurement of radioactivity).
- **Laboratories for Cellular Studies** (Main equipment: CO_2 incubators; biohazard cabinets, low temperature freezer (-80ºC), refrigerated centrifuge with conventional rotors, inverted and conventional optical microscopes, automated cell counter, multimode microplate reader, UV-vis spectrophotometer, Fume

cupboard with radioprotection barriers, biohazard cabinet with radioprotection barriers, dose calibrators, radiation monitors).

- **Laboratory for Animal Studies** (approved by the National Authority, DGAV, for small rodents experimentation. Main equipment: animal housing facility; individual ventilated cage system (IVC); fume hoods for animal injection and biodistribution; dose calibrator; Hidex gamma counter)

Animal models available

Different strains of normal and immunodeficient mice models (athymic nude, SCID mice); Expertise on xenografts inoculation with different tumoral cell lines (prostate, lung, lymphoma, breast, melanoma, etc).

Support available

The support available to the users during and after their visit at the RS/IST-ID biomedical facility can be found in Table 2.

Table 2. Support available at the RS/IST-ID facility.

Support	Remarks
Help/supervision with radiolabeling	
Help/supervision with radiolabeling quality control	
Help/supervision with labeled compound stability studies	
Help/supervision during cell studies setup	
Help/supervision during cell studies follow-up and results reading	
Help/supervision with animal handling	
Help/supervision with biodistribution and pharmakocinetics studies	
Help/supervision with therapeutic efficacy studies	
Help with publication writing	