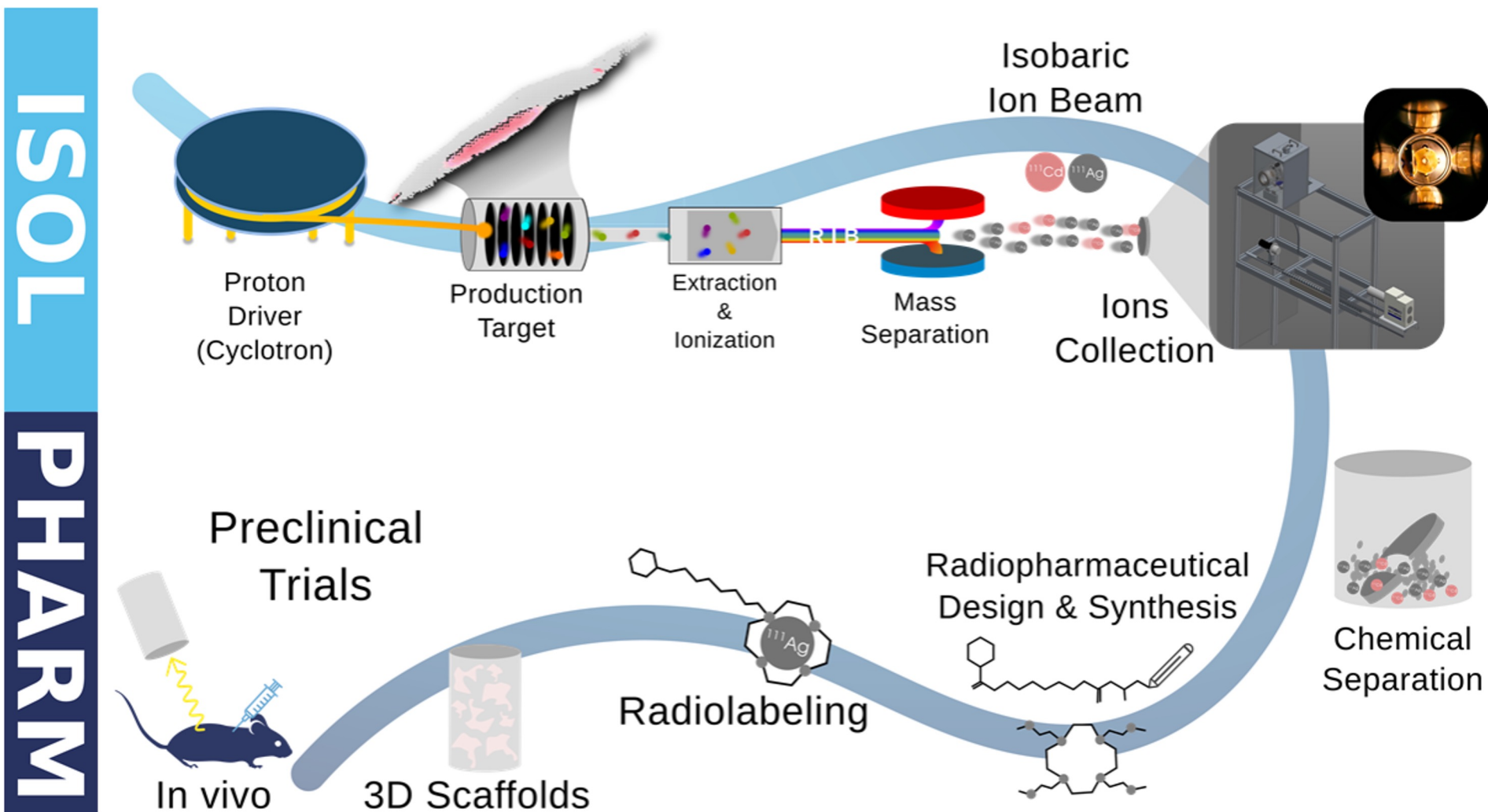


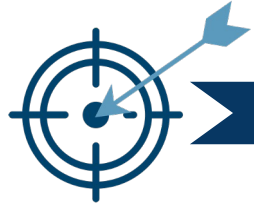
Advanced Dosimetry Methods and In-vitro Radiobiology of Ag-111 Labeled radiopharmaceuticals

A. Andrighetto

The ISOLPHARM project aims to study innovative radiopharmaceuticals for targeted radionuclide therapy.

ISOLPHARM is also a collaboration between different universities and research centers.





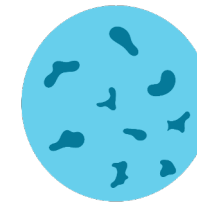
Work Package Aim

The whole set of experimental activities concerning **radiobiology**. In particular cell survival in 2D and 3D scaffolds will be evaluated. The acquired **radiobiological data** will be related to the absorbed **dose at cell** level, which will be calculated using Monte Carlo method, exploiting the available data about **^{111}Ag uptake *in vitro*** and transporting the emitted radiation in simulated geometries that reproduce the monolayer or the **3D scaffold**.

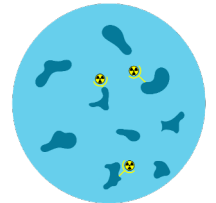


4-1 & 4-2 - Cell survival in 2D and 3D scaffolds

A tumoral cell line overexpressing the **CCK2** receptor will be selected, starting from the previously acquired data on **A549** and **A431** CCK2R+ cells and possibly improved with the ones already available in the biology laboratory. Following the exposition of cells, the culture liquid will be removed in order to minimize the background signal and study the radioactive contribution only coming from the radiopharmaceutical which interacted with the cells and, after a chosen time window, the cells will be detached and re-seeded and their survival will be assessed by means of a clonogenic assay.



Step 1:
Culture Preparation



Step 2:
Irradiation



Step 3:
Growth Stimulation



Step 4:
Colonies Counts

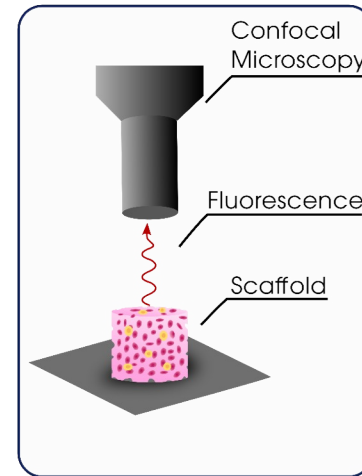


4-3 & 4-4 - Dose Computation in cell cultures

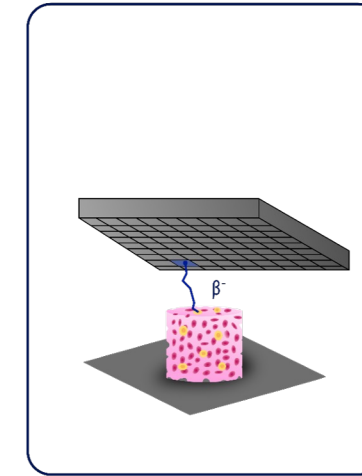
The acquired **radiobiological data** will be related to the absorbed **dose at cell level**, which will be calculated using Monte Carlo method, exploiting the available data about ^{111}Ag uptake *in vitro* and transporting the emitted radiation in simulated geometries that reproduce the monolayer or the 3D scaffold.

PHASE I

Confocal Microscopy

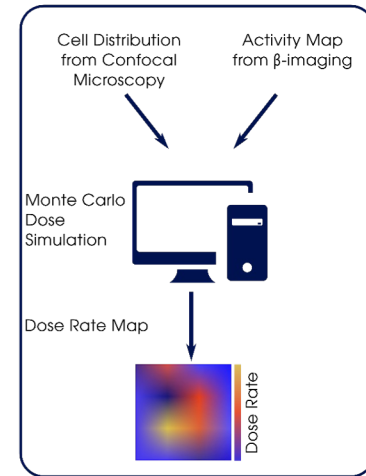


PHASE II

 β -imaging

PHASE III

Dose Estimation



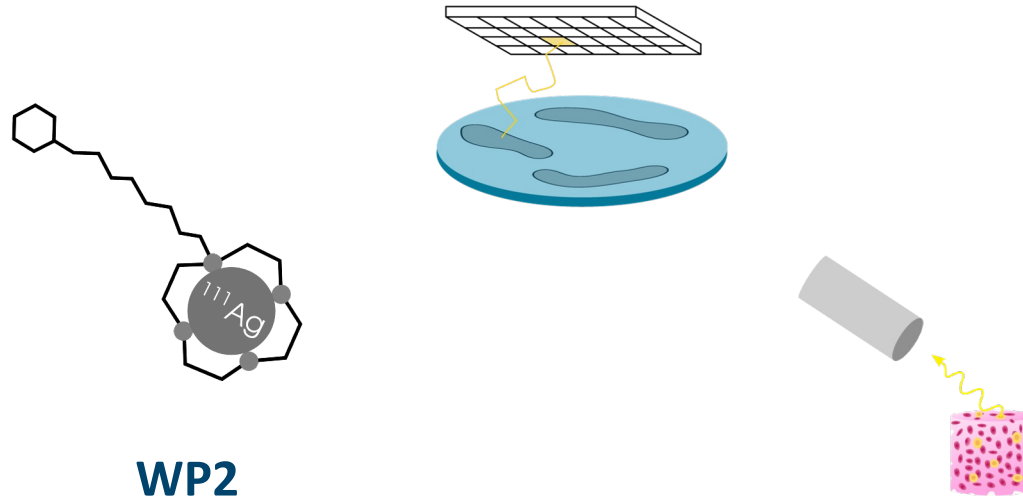
Cell survival curves are studied as a function of the absorbed dose at cell level, which can be computed by means of Monte Carlo codes.



Istituto Nazionale di Fisica Nucleare
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WP3

Development of a β -imaging system based on solid-state detector

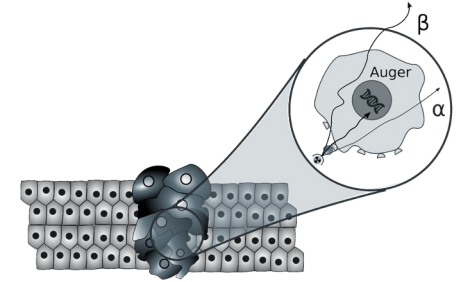


WP2

Development of a γ -imaging scintigraphic system for ^{111}Ag

WP4

Radiobiological characterization of ^{111}Ag radiopharmaceutical



WP1

Radiopharmaceutical production



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



Istituto Nazionale di Fisica Nucleare
Sezione di Bologna



Requests

Consumables	Laboratory Material	3 k€
Shipping	Samples, Targets, etc...	6 k€
Travels	For experimental activities	9 k€
Total		18 k€

1° year		
Consumables	Laboratory Material	1 k€
Shipping	Samples, Targets, etc...	2 k€
Travels	For experimental activities	3 k€
Total		6 k€

Nome	FTE
Giorgio Russo (resp. Loc.) – IBFM CNR	0,2
Francesco Paolo Cammarata – IBFM CNR	0,5
Rosalba Parenti - UNICT	0,5
Concetta Gambino – IBFM CNR	0,5
Alessandro Stefano – IBFM CNR	0,5
totale	2,2