



HAL
open science

Presentation of the CIRIL / radiation biology platform dedicated for experiments with the GANIL facility

Chevalier François, Violaine Vizcaino, Jean-Christophe Pouilly, Alain Mery,
Jimmy Rangama

► To cite this version:

Chevalier François, Violaine Vizcaino, Jean-Christophe Pouilly, Alain Mery, Jimmy Rangama. Presentation of the CIRIL / radiation biology platform dedicated for experiments with the GANIL facility. ERRS 2021, Nov 2021, CAEN, France. hal-03757189

HAL Id: hal-03757189

<https://hal.science/hal-03757189v1>

Submitted on 22 Aug 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Presentation of the CIRIL / radiation biology platform dedicated for experiments with the GANIL facility

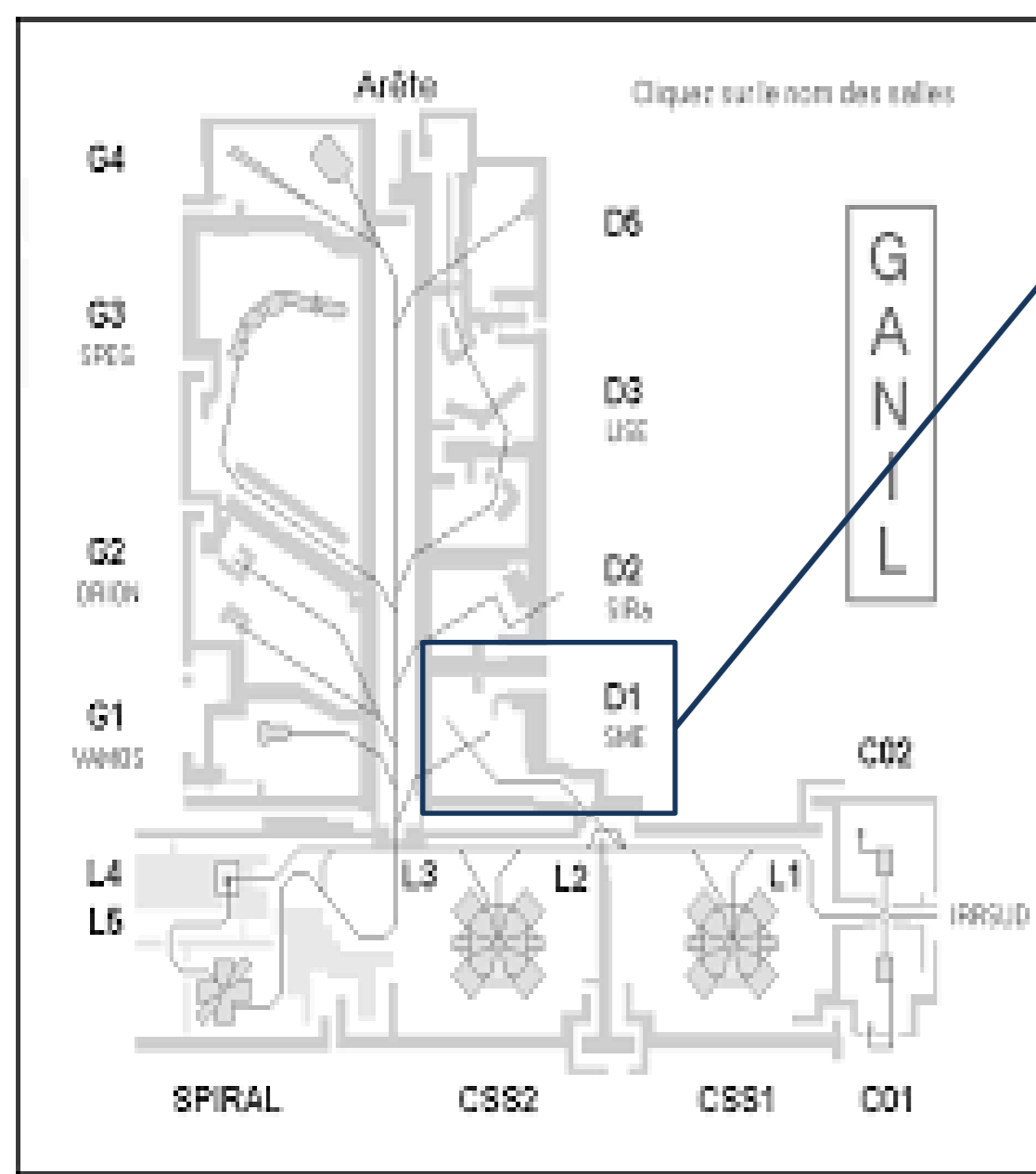
Chevalier François^{1,2,3}, Vizcaino Violaine^{2,5}, Pouilly Jean-Christophe^{2,5}, Mery Alain^{1,2,4,5} and Rangama Jimmy^{1,2,6}

- 1 CIRIL platform, CIMAP, Caen, France
 - 2 UMR6252 CIMAP, CEA, CNRS, Normandie Univ, ENSICAEN, Caen, France
 - 3 CIRIL local contact for radiation biology, chevalier@ganil.fr
 - 4 CIRIL technical coordinator of the High Energy beam line, mery@ganil.fr
 - 5 Biological dosimetry group for the High Energy beam line
 - 6 CIRIL scientific coordinator, rangama@ganil.fr
- Radiation biology platform: <http://cimap.ensicaen.fr/spip.php?article546>

Centre interdisciplinaire de
recherche sur les ions lourds

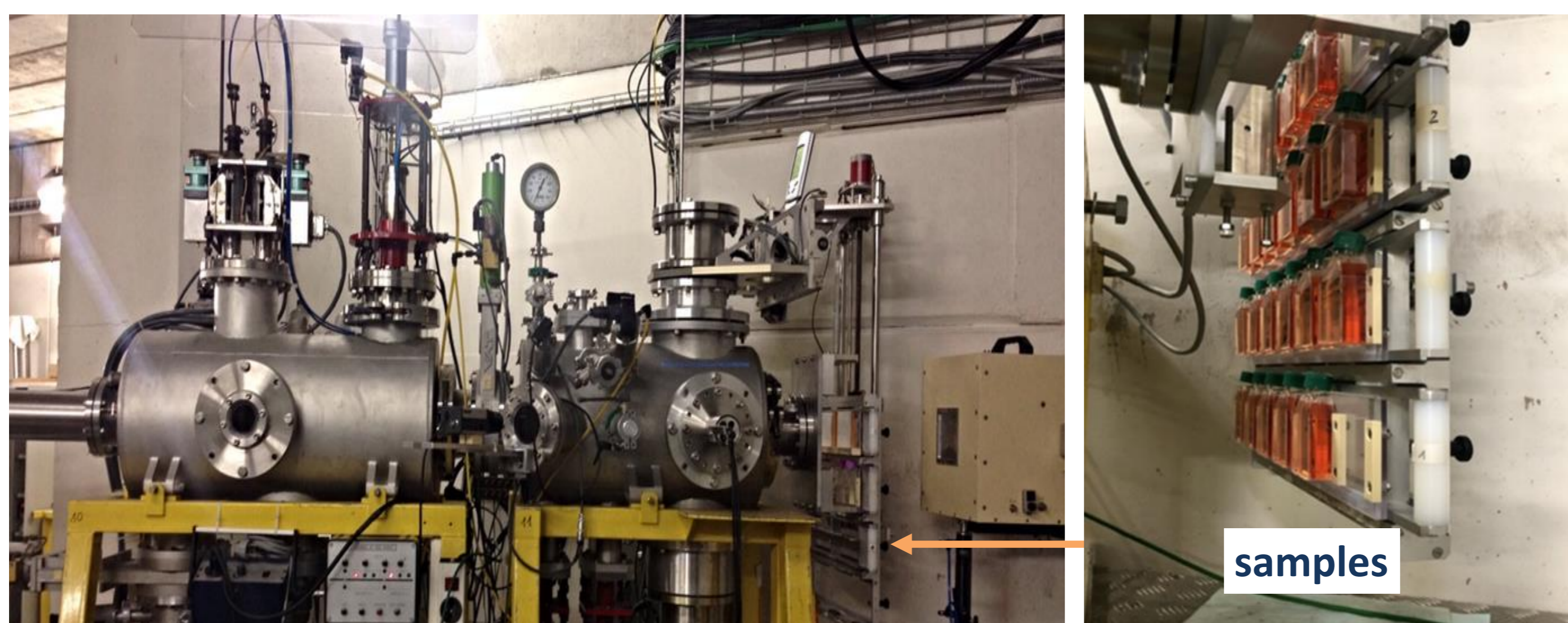


The Center for Interdisciplinary Research with Heavy Ions (CIRIL) is the platform for all the interdisciplinary experiments carried out with the beams of the GANIL (Large National Accelerator of Heavy Ions). Since 1982, this platform, managed by the CIMAP laboratory (Research Center on Ions, Materials and Photonics), aims to welcome experimenters from all over the world, to ensure the development of equipment adapted to proposed experiments (irradiation chambers, sample holders, in-situ analysis devices, dosimetry, etc.) and to maintain the 4 beam lines, covering a wide range of energy: ARIBE (keV), IRRSUD (0.3-1 MeV / A), IRASME (4-13 MeV / A) and IRABAT (24-95 MeV / A).



Room D1 for Radiation - Biology

Flasks :	12,5 cm ² 25 cm ² (X23 positions)
Tubes :	0,5 ml 1,5 ml 2 ml
Plates :	48 wells (9 wells available) 96 wells (36 wells available) 384 wells (264 wells available)



Beam times are selected and allocated according to specific scientific programs*, such as iPAC or CORA IBER. Further information about these programs are available online*.

The radiation biology platform is devoted to the studies of ion beams effects on biological systems. The platform includes a comprehensive and state-of-the-art L2 cell culture room and a biochemistry laboratory, allowing hosted teams to perform various radiation biology experiments. Furthermore, the platform can be adapted for special requirements such as hypoxic conditions, etc...

Irradiation with ion beams are performed at the GANIL facility, 50 m from the radiation biology platform, which makes the transfer of irradiated samples easy and quick. A remotely controlled sample holder allows the sequential irradiation of 23 windows of 25 cm², including flasks, tubes and slides. Most experiments are run with a carbon ion beam at a kinetic energy of 95 MeV/u (LET in water is about 25 keV/μm) at a low fluence (low dose). Other ion beams could be also delivered for specific requirements. PMMA devices can be used to degrade to beam energy in order to increase the linear energy transfer of ions. For each experiment, a dedicated team of physicists from the CIMAP laboratory is involved in the beam tuning and specific biological dosimetry [1].

[1] Durantel, F. et al. Dosimetry for Radiobiology Experiments at GANIL. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 2016, 816, 70-77.

*iPAC: <http://cimap.ensicaen.fr/spip.php?article431>

*CORA IBER:

https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Research/Research_Announcements

located within the INB secure area facilitating cell transfer
between irradiation room and cell culture lab



ARIA

Applications in Radiobiology with Accelerated Ions
Accueil et Recherche en Radiobiologie des Ions Accélérés

