

# Creating a roadmap for the industrialization of the HITRIplus technologies

## HITRIplus WP4 – Innovation, technology transfer, industry relation

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4TH PROJECT MEETING AND HADRONTHERAPY WORKSHOP - FROM INNOVATION TO IMPLEMENTATION

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008548

WP4:

devise and implement  
a ROADMAP for  
the INDUSTRIALISATION  
of the HITRIplus  
TECHNOLOGIES

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# Academia/research & industry: why collaborate?

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Collaboration is successful if there is mutual benefit

# Academia/research & industry: why collaborate?

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## The goals and interests of university technology transfer

Research universities partner with industry and transfer technology to achieve five goals:

Facilitate the commercialization of university discoveries for the public good;

Promote economic growth;

Reward, retain and recruit faculty and students;

Forge closer ties to industry; and

Generate income for education and research.

*Louis Berneman*

*«University-Industry Collaborations: Partners in Research Promoting Productivity and Economic Growth»*

Research Management Review, Volume 13, Number 2 Summer/Fall 2003

[https://www.immagic.com/eLibrary/ARCHIVES/GENERAL/NCURA\\_US/N030902R.pdf](https://www.immagic.com/eLibrary/ARCHIVES/GENERAL/NCURA_US/N030902R.pdf)



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# Academia/research & industry: why collaborate?

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## Today, this is not so different

Stimulate student entrepreneurship

Inventions/know-how become innovative products, change society

Contribute to economic growth

New revenue sources

Demonstrate the usefulness of basic science\*

\*Not that I think that basic science needs an applicative purpose to be justified!

# Academia/research & industry: why collaborate?

## How companies approach innovation: A McKinsey Global Survey

Sources used to develop new ideas or commercialize new business, % of respondents who are top managers,<sup>2</sup> n = 722



### Where to find the next new idea?

% of respondents who are top managers,<sup>1</sup> n = 722

#### Sources of new ideas according to organization's leadership



<sup>1</sup>Executives at senior vice president level and above; respondents could select multiple answers; respondents who answered "other" or "don't know" are not shown.

2007

# Academia/research & industry: why collaborate?

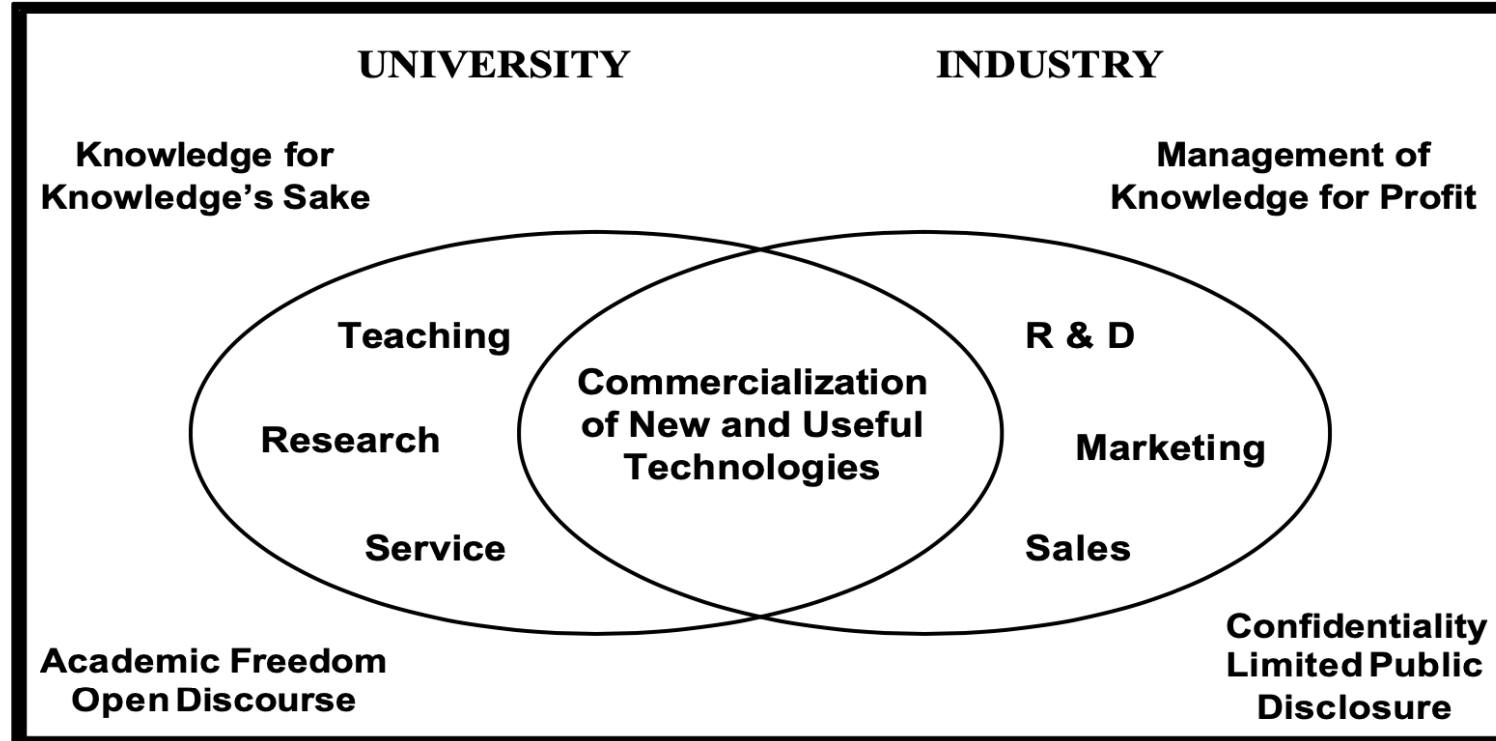
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Collaboration is successful if there is mutual benefit:

Finding ways to provide industry the competitive advantages they need, while preserving the core values of academia

# Conflicting values – Common Interests



Louis Berneman

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# Academia/research & industry: **how** to collaborate?

## Academia/research

IP, patents,  
commercialisation, market  
assessment are dirty words

We want to present at a  
conference next week!

## Industry

We don't have time for  
the bureaucratic  
burden of academia

We want to keep it  
confidential!

# An example: the Industry liaison work package of the HITRIplus project

## What is it

A WP to devise and implement a roadmap for the industrialisation of the technologies developed within the EC-funded HITRIplus project

## How

Technology overview/assessment

Technology promotion

Technology matching

## Who

The technology transfer offices of three academic partners (CERN, GSI, INFN)

The Technology Overview Committee (tech transfer + tech WP leaders)

Liaison with the HITRIplus management and publication committee

# Three main tasks to achieve objectives

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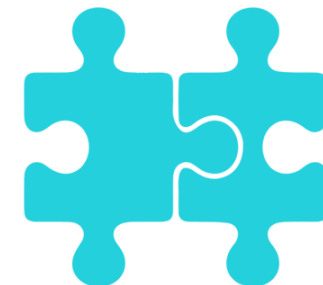
Task 4.1: Technology overview/assessment (CERN, GSI, INFN)



Task 4.2: Technology promotion (GSI, CERN, INFN)



Task 4.3: Technology matching (INFN, CERN, GSI)



# D4.1: HITRIplus Technologies and dissemination plan

Delivered:  
January 2024

- Identifies technologies from WP7-12 and presents them as commercial opportunities
- Showcases project benefits to European Industry
  - Heavy ion therapy as a business case
  - Benefits beyond hadrontherapy
- Identifies valuable opportunities for partnerships and co-development
  - Within the consortium
  - With strategically selected companies



The image shows the cover page of a report titled 'Deliverable 4.1 HITRIplus technologies and dissemination plan'. At the top left is the HITRI logo (Heavy Ion Therapy Research Integration) and the reference number 'Ref. H2020-INFRAIA-2020-1-RIA GA - 101008548'. To the right is the European Union flag. Below this, it says 'Horizon 2020 - INFRAIA-2020-1' and the HITRIplus logo. The project is identified as 'Project: 101008548- HITRIplus' and 'Heavy Ion Therapy Research Integration plus' with the website 'https://www.hitriplus.eu'. The title 'Deliverable 4.1 HITRIplus technologies and dissemination plan' is centered. Metadata includes: Date: 16/01/2024, Due Date: 31/01/2024, Type: Report, Dissemination Level: Confidential, Work Package: WP4, Lead Beneficiary: CERN, Author(s): S.Muhr, and Contributing Beneficiaries: GSI, INFN. At the bottom left is the European Union flag and a funding statement: 'This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008548'.

# D4.2: Value Propositions - Targeted at companies

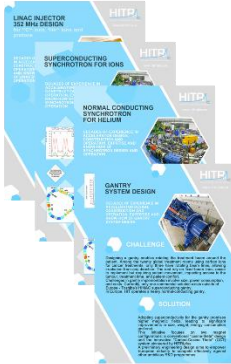
Delivered:  
January 2023

## Brochure Versions

Technology  
HITRIplus Industry Flyer



Linac Injector 352 MHz Design



Superconducting Synchrotron for Ions/ Normal conducting Synchrotron for Helium

Gantry System Design

Technology  
Magnet System Design



Architectural Model of an Accelerator Control System for Multi-Energy Operation

Novel Designs for Treatment, Accelerator Control Software, and Safety Systems

Standardization of Radiobiological Experiments

One brochure with 7 appendixes:

- Available for hand-out at conferences
- Available on project website
- Available for stream-out on social-media

**HITRIplus** 715 followers 3d

**?** DID YOU KNOW? Irradiating cancer using heavy ion beam treatment is extremely effective, not to mention it can be used to tackle tumours not treatable with conventional X-ray radiotherapy.

**!** BUT? Heavy ion therapy facilities are very large and very expensive. There are only four centres currently in Europe.

**!** WHAT CAN BE DONE? Through the HITRIplus project, two designs for new synchrotrons are being investigated that can both reduce the size and cost of ion therapy centres.

**!** HOW? One design features several upgrades, including superconducting magnets and a slow extraction system, that could shrink synchrotron dimensions by two to three times, while increasing the treatment intensity tenfold. Another design is a helium synchrotron, which is cheaper to build and run and offers more enhanced precision compared to the more common proton synchrotrons.

**!** WANT TO KNOW MORE? Read about the designs for the two synchrotrons in this brief value proposition info sheet here: <https://lnkd.in/dKAMJNdu>

61 · 1 Comment

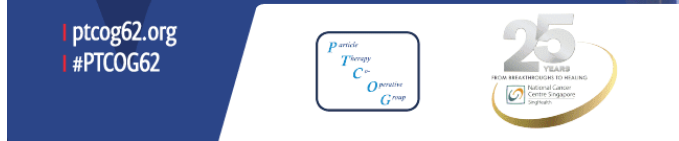


Outreach activities at the 62nd Annual PTCOG Conference

Promotional LinkedIn posts streaming out the value propositions

# D4.3: Technology Matching Event

Deadline: by  
September 2024



## Marco Durante

- PTCOG (Particle Therapy Co-Operative Group) Chairman
- HITRIplus WP6 Leader



A total of 37 exhibitors present, thereof European companies:

- C-RAD AB
- Cosylab
- DE.TEC.TOR. Devices and Technologies Torino
- Elekta
- Gold Anchor
- IBA
- Leo Cancer Care
- LinearBeam
- MedCom GmbH
- PTW Freiburg GmbH
- RaySearch Laboratories AB
- Terapet SA
- Varian, a Siemens Healthineers company

Reach out to all the European companies present and their contacts collected.

Ca 60 industry brochures distributed and ca 10 ex of each technology value proposition.

Recommended course of action to follow up and plan meetings with:

- DE.TEC.TOR. Devices and Technologies Torino
- IBA
- LinearBeam



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## Results so far

- 12 HITRIplus Technologies Identified
- 3 Companies have signed the Memorandum of Understanding with the coordinator
- 7 Value Propositions and one brochure for WP7-12 technologies have been produced
- 8 Promotional LinkedIn posts have been made using the Value Propositions and brochure, and they have been used for reach out at the Technology Matching Event
- 13 European Companies were contacted at the Technology Matching Event (PTCOG Singapore)

## Pain points

- Signing contracts (not simply NDA and MOU) with industry should be a priority goal
- Feedback could be collected from industry on reluctance to arrive to concrete actions
- Avoiding having a “double payment” by industry for a development by establishing a synergy e.g. benefits shared only in case of successful industrial production
- Evolving towards industrial solutions with some stability in the production, avoiding moving from one prototype to another (serial production of units, service contracts, updates and upgrades, and avoiding new systems for unique users)

## Way forward

- Booth at ESTRO 2025 for additional outreach to European companies
- Panel discussion this evening to collect feedback from industry
  - How to achieve more concrete contacts with industry?
  - How can feedback be collected?
  - How can synergies be established?
  - How to evolve towards industrial solutions and avoid moving from prototype to prototype?



# Provocative thoughts

Prof. Dushyant Sahani MD (University of Washington), vice president of the International Society of Computed Tomography. In his presentation he noted that the growth in CT scanning had reached a plateau in the last 10 years as the technology has matured and devices have reached an impeccable level of precision. The new imaging technique of spectroscopic X-ray imaging could give the field a new boost, leading it to new pathways beyond the current plateau.

A key milestone in that direction is the approval by the US Food and Drug Administration (FDA) authority of “the first new major technological improvement for computed tomography imaging in nearly a decade,” in the form of a photon counting scanner from Siemens.

Prof Sahani noted that CERN’s workshops have been instrumental in advancing this technology and bringing it from the lab to the clinic.

This was also reflected in the statement by Steffen Kappler of Siemens, who led the development of their photon counting scanner: “I am convinced that institutions like CERN play an important role for innovations in medical imaging. Communities like the Medipix Collaboration and the SpecXray Workshop are essential instruments of our society, connecting and affirming researchers in academia and industry during the maturation and commercialization processes of disruptive detector technologies for medicine”.

<https://ep-news.web.cern.ch/content/enhancing-sensitivity-spectroscopic-x-ray-imaging>

# Happy to answer your questions

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