IHI Call Days | Call 9

Walk Through PET for high patient comfort and clinical efficacy.

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Link to the IHI brokerage platform:

Walk Through PET for high patient comfort and clinical efficacy
https://ihicalldays2024.converve.io/index.php?page=profiles&action=show&params%5Bid%5D=279&params%5Bshow%5D=tech

Participant profile
https://ihicalldays2024.converve.io/index.php?page=ed_profile

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Challenges and objectives

- Describe concisely how your proposal will address the challenge(s) of the IHI JU's specific objective of your choice (as described in the **IHI Strategic Research and Innovation Agenda**)

  What problem(s) are you trying to solve:

  PET scan duration is still relatively long (about 10 min) and due to the relatively long scan time patients need to lay horizontally on a bed in a cylindrical scanner. A totally novel PET design recently proposed by our team is a vertical flat panel system with patients standing in between 2 large detector panels, so called Walk-Through PET. The advantages compared to state-of-the art PET are:

  1. Increased sensitivity for lower cost
  2. Fast patient throughput, scan time is estimated to be only 30 sec
  3. Very compact footprint due to its upright orientation, small rooms will ac
  4. More efficient tracer usage due to fast scanning
  5. Reduction in operational personnel
  6. Improved quantification due to high resolution detectors

  - Which IHI specific objective(s) are you addressing?

  SO2: integrate fragmented health research and innovation efforts bringing together health industry sectors and other stakeholders, focussing on unmet public health needs, to enable the development of tools, data, platforms, technologies and processes for improved prediction, prevention, interception, diagnosis, treatment and management of diseases, meeting the needs of end-users

  Which unmet public health need are you addressing?

  SO3: demonstrate the feasibility of people-centred, integrated health care solutions

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Your approach to solve the problem

- Provide a short description of the proposal:

A totally novel PET design recently proposed by our team is a vertical flat panel system with patients standing in between 2 large detector panels, so called Walk-Through PET. This promising concept is inspired by airport scanners where passengers are scanned standing with very high passenger throughput. It is enabled by patented novel detector technology resulting in 3D position information.

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Is your project suitable for IHI?

- IHI aims to fund large-scale projects focusing on health innovation.

The hardware of this prototype is already being developed directly with Industrial partners (Comate engineering, ST Engineering). The software part is coming from the leading academic group and will need further modifications towards a product. The step towards a full medical device will require input from medical device companies. To bring the system on the long term to the market will require connections with medical imaging companies. Specific innovative tracers can be provided by pharma and diagnostics companies

- Where do you see the contribution of industry in your proposal? Why do you require different health industry sectors (e.g. pharma, vaccines, biotech, medical devices, in vitro diagnostics, radiotherapy, medical imaging health ICT)?

PET is a complex and very multidisciplinary procedure involving multiple interconnected elements. Producing these radiopharmaceuticals requires either a cyclotron (which must be on-site or within a few hours' distance) or expensive generators (68Ge/68Ga generators), along with specialised hot labs. System innovations are often originating from academic groups and translated via these type of projects into products. The innovative use of this device will require interaction with companies in the field of pharma and tracer development.

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Outcomes and Impact

- What do you expect out of your proposal in terms of concrete results/outcomes and impact?

Proof of concept of the Walk-Through PET in clinical setting

- How do you envisage your proposal to ensure translation from research to innovative solutions that can be integrated/implemented into the healthcare ecosystem

This superior system will also enable to expand the number and groups of patients in PET and result in additional information impacting expensive therapeutic decisions. In this project we want to explore 3 specific patient populations in oncology (prostate), lung fibrosis and rheumatoid arthritis and to determine how we can make expensive therapies more cost-effective using Walk-Through-PET scans.

- How does your project proposal contribute to strengthening the competitiveness of the Union's health industry?

This is a unique PET scanner design very competitive with more expensive systems from US and Chinese medical imaging companies

- How does your project proposal contribute to the expected benefits for patients?

This system will dramatically increase the throughput in PET scanning and also enables low dose imaging. This superior system will also enable to expand the number and groups of patients in PET and result in additional information impacting expensive therapeutic decisions.

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Expertise and resources

- We have:
  - The hardware of this prototype is already being developed directly with Industrial partners (Comate engineering, ST Engineering). The software part is coming from the leading academic group and will need further modifications towards a product.
- We are looking for:
  - Partners with expertise in bringing medical imaging systems to the market and setting up clinical studies

If you are bringing in-kind contributions (IKOP* and IKAA for Private members, cash or in-kind contributions for Contributing Partners), state it clearly.**

* IKOP - in-kind contributions to operational activities
** IKAA - in-kind contribution to additional activities

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Additional information

- Project info at WT-PET.org

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