

IHI Call Days | Call 12

● **INSIGHT: Integration of Whole-Body PET Imaging and Liquid BiopSY for Early Cancer Detection and better outcomes through integrated Healthcare**

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Link to the [IHI brokerage platform](#): [IHI Call 12- Brokerage Event and Platform | Proposals](#)

- Proposal sharing tool
- [Participant profile](#)

Challenge and objectives



Challenges in cancer diagnosis



Late-stage cancer detection significantly reduces survival rates, underscoring the urgent need for more sensitive and accessible screening methods.

Many cancers remain asymptomatic in early stages, making timely detection difficult.

Conventional screening tools—such as mammography, CT, and MRI—often lack the sensitivity to detect small or early-stage tumors.

As a result, a substantial proportion of cancers are diagnosed at advanced stages, when treatment options are limited, and prognosis is poor.

Screening programs vary in effectiveness and accessibility, leaving gaps in early detection, particularly in underserved populations.

Innovative diagnostics are urgently needed to detect cancer early, before symptoms appear, improving patient outcomes.

Technology readiness

Total-Body PET enables fast, full-body scans with **high sensitivity** and **low radiation**, offering a powerful tool for **early cancer detection** and **comprehensive screening**



Liquid biopsy technologies, including **ctDNA detection**, are emerging as promising yet still maturing tools that can complement imaging by enhancing early cancer detection and enabling integrated, **minimally invasive diagnostics**.



Disjointed use of technology

Workflow incompatibility

Total-Body PET imaging and ctDNA analysis often operate in separate clinical workflows, making it difficult to coordinate data collection and interpretation

Data Silos

Imaging data and molecular data from ctDNA tests are typically stored and analyzed in different systems, limiting cross-modality insights.

Lack of Standardized Integration

There is no widely adopted framework for integrating PET imaging results with ctDNA biomarkers or vice versa, hindering combined diagnostic utility.

Temporal Misalignment

Timing differences between PET scans and ctDNA sampling hinder real-time correlation of imaging and molecular data.

Our vision to address the challenge

Whole Body PET applications in cancer screening



Comprehensive Detection with Whole-Body (WB) PET

WBPET imaging enables sensitive detection of asymptomatic and early-stage cancers across multiple types (e.g., Breast, lung, colorectal, prostate, neuroendocrine, lymphoma, melanoma), including identification of small lesions and occult metastases.



Enhanced Tumour Characterization

WBPET imaging provides metabolic insights across the entire body, revealing disease heterogeneity—crucial for personalized treatment planning and early intervention



Integration of Liquid Biopsy(LB) for Non-Invasive Screening

LB (ctDNA, WGS, RNA, exosomes) can serve as a first-line screening tool to identify high-risk individuals, guiding the use of PET imaging more effectively and or as a means to characterize disease immediately following WBPET.



Molecular Profiling for Precision Diagnosis

When PET detects suspicious lesions, liquid biopsy enables genomic and methylation profiling to confirm malignancy, assess tumour burden, and identify actionable mutations for targeted therapies.



Longitudinal Monitoring and Early Recurrence Detection

Combining WBPET imaging with liquid biopsy allows for dynamic monitoring of treatment response and early detection of recurrence, reducing reliance on invasive procedures.



AI-Driven Workflow Optimization

AI tools can enhance image interpretation, integrate multi-modal data (imaging + molecular), and support clinical decision-making, thereby accelerating diagnosis and improving outcomes.

Why is it a good project for IHI?

- Early cancer detection through whole-body PET imaging and liquid biopsy **demands coordinated innovation** across clinical research, imaging technology, and molecular diagnostics.
- A public-private partnership **ensures scalability, accelerates validation, and aligns regulatory, clinical, and industrial expertise** to deliver comprehensive, patient-centric solutions with better outcomes.
- Industry partners bring critical capabilities—from **advanced imaging systems and biomarker assay development to data integration and AI-driven diagnostics**.

Outcomes and Impact

Cancer early diagnose

Comprehensive Detection with Whole-Body PET

Enhanced Tumour Characterization

Integration of Liquid Biopsy (ctDNA, RNA, exosomes) for Non-Invasive Screening

AI-enabled data & workflow operations

Dataset process with AI

Machine learning implementation

CDSS development

Prediction with AI

Workflow optimization

Enhancing personalized treatment

Molecular Profiling for Precision Diagnosis

Longitudinal Monitoring and Early Recurrence Detection

Healthcare leadership ecosystems

Collaboration with clinical professional societies

International guideline development

Patient engagement

Improve Patient Experience Through Minimally Invasive Diagnostics

**Empower Patients with Personalized Information
Enhance Equity in Early Diagnosis**

Support Continuous Patient Monitoring and Engagement

Regulatory enablement

Enabling streamlined regulatory pathways

Facilitate health technology assessment processes

Expertise and resources

- We have:
 - Diagnostic: Medical Device
Digital: AI-tools, AI boosted healthcare application
 - Academy leader: Jules Bordet Institute
- We are looking for:
 - Academic partners across EU & AC
 - Industry partners – MedTech Company, Pharma Company, Digital Company
 - Specialists of pain characterization & management
 - Patient organizations
 - Research org.