BIOTOOL-CHF 1st Workshop Report

Tackling congestion in chronic heart failure: a multistakeholder workshop to define a new pathway for improving patients' outcomes

Project information

Grant Agreement Number	101095653
Project Full Title	BIOmarker based diagnostic TOOLkit to personalize pharmacological approaches in congestive heart failure
Project Acronym	BIOTOOL-CHF
Topic	HORIZON-HLTH-2022-TOOL-11-01
Type of action	HORIZON Research and Innovation Actions
Granting authority	European Health and Digital Executive Agency
Start date of the project	01 October 2023
Duration	60 months
Project Coordinator	Luciano Potena (IRCCS AOU BO)
Project Website	www.biotool-chf.eu

Event Information

Title of the event	Tackling congestion in chronic heart failure: a multistakeholder workshop to define a new pathway for improving patient's outcomes
Date and time	31st August 2024 | 12:00 – 14:00
Location	London (UK), Sunborn London Yacht Hotel
Type of Event	Multistakeholder Workshop
Participants	34
Stakeholder Groups	Healthcare professionals and Researchers
Background and Characteristics	The BIOTOOL-CHF workshop, held in conjunction with the ESC Congress 2024 in London, was a multi-stakeholder event targeting both industry and research communities. It aimed to raise awareness on congestion diagnosis in chronic heart failure, foster dialogue with device developers, and collect insights on current clinical practices. The proximity to ESC allowed for enhanced networking and broader dissemination.
Organizing Entities	Tinexta Innovation Hub, Policlinico di Sant'Orsola (Project Coordinator), University of Bologna

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1 Executive summary

This report provides an overview of the first multistakeholder workshop organised by the BIOTOOL-CHF project, which took place on 31 August 2024 in London, in parallel with the ESC Congress. The workshop brought together 34 participants, including cardiologists, researchers, and representatives from academia and industry, to discuss innovative approaches for diagnosing and monitoring congestion in chronic heart failure (CHF).

The event aimed to foster early dialogue with healthcare professionals, a key target group for the project, and to collect expert feedback on current clinical practices and unmet needs. Presentations covered a range of topics, including the use of implantable and non-invasive devices, biomarkers, big data, and point-of-care diagnostics. The workshop also contributed to the project's wider strategy of co-developing personalised diagnostic solutions by actively involving end users from the early stages.

The report outlines the context, structure, and content of the event, highlighting the relevance of the discussions for the future development and implementation of the BIOTOOL-CHF diagnostic toolkit.

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2 Introduction

2.1 BIOTOOL-CHF in brief

Heart failure affects millions of people in Europe and is a leading cause of hospitalization, with a high risk of death within five years. While certain medications effectively help those with reduced heart function, the evidence supporting the use of diuretics, which relieve symptoms by reducing fluid buildup, is outdated. Current methods of assessing fluid overload are not very accurate, leading to ineffective use of diuretics in many cases. This can result in persistent symptoms, hospital readmissions, and hampering adherence to other treatments. To address these challenges, BIOTOOL-CHF aims to develop new tools, including biomarkers and artificial intelligence-based scores, to better predict and manage fluid accumulation in heart failure patients. Additionally, they plan to create a convenient diagnostic tool for healthcare providers to measure biomarker levels at the point of care. This approach aims to improve the use of existing treatments and personalize the management of heart failure for better patient outcomes.

2.2 Purpose of the workshop

D8.2 Plan for the dissemination and exploitation including communication activities (PDEC) first release submitted on M6, defined the different strategies and activities to be organized by the consortium to reach different target groups, improving awareness about the project aims and results. Workshops towards healthcare professionals and patients' associations are one of the activities foreseen to be organized at least once a year, both in person and remotely according to a precise engagement program. These activities will focus initially on receiving feedback from healthcare professionals and then delivering the project results, thus establishing a co-creation to produce an output developed to respond directly to their needs. Strategic collaborations with healthcare professionals' associations as well as patient's associations will be sought from the beginning of the project to ensure the involvement of patients in specific activities in order to communicate outputs and results of the project.

3 BIOTOOL-CHF 1st workshop

On August 31st, 2024, the BIOTOOL-CHF project organized a successful multi-stakeholder workshop in London, in conjunction with the prestigious ESC Congress 2024. Held on board the Sunborn London Yacht Hotel, the event gathered cardiologists, researchers, industry professionals, and healthcare innovators to explore current challenges and novel approaches for diagnosing and monitoring congestion in chronic heart failure (CHF).

Figure 1: BIOTOOL-CHF 1st Workshop - Full room

Moderated by **Dr. Renate Schnabel**, Professor of Internal Medicine and Cardiology at the University Heart and Vascular Center Hamburg, the workshop featured a series of presentations by leading experts, each offering unique perspectives on technological advancements, clinical needs, and emerging strategies to improve CHF patient outcomes.

3.1 Target audience

The main target the 1st workshop addressed was target group A - Healthcare professionals, Cardiologists and Primary providers of healthcare services, specifically. For this reason, the organization of an event parallel to the ESC Congress 2024 was considered. The European Society of cardiology (ESC) is a world leader in the discovery and dissemination of the best practices in cardiovascular medicine. The association is composed by over 100,000 scientists, clinicians, nurses and allied professionals working in all fields of cardiology from more than 150 countries. This unique network allows us members to understand the impact of cardiovascular disease and how they can better reduce its burden. The ESC Congress 2024 in London had approximately 32,000 health professionals in attendance. These attendees came from 171 different countries and

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represented all fields of cardiovascular medicine. The congress highlighted the theme of "Personalizing Cardiovascular Care.

Project Coordinator, Luciano Potena (IRCCS AOU BO), and Prof. Igor Diemeberger (UNIBO) had the chance to participate to the event to promote the 1st workshop of BIOTOOL-CHF project directly on-site. This activity, in addition to the promotion on the project website and on social media, resulted in the presence of 34 people expert in congestion diagnosis in chronic heart failure.

4 Agenda

Moderator: Renate Schnabel

12:00 – 12:10 > Welcome and registration

1**2:10 – 12:15 >** Luciano Potena | Policlinico di Sant'Orsola | *Introduction of the Workshop*

12:15 – 12:30 > Jozine ter Maaten | University Medical Center Groningen | *What is congestion and why it is important in CHF*

12:30 – 13:00 > **How to diagnose/monitor congestion:**
- **12:30 – 12:40** > Finn Gustafsson | Rigshospitalet | *Implantable devices*
- **12:40 – 12:50** > Igor Diemberger | Alma Mater Studiorum Università di Bologna | *Non-invasive devices*
- **12:50 – 13:00** > Rafael de la Espriella | Hospital Clínico Universitario de Valencia | *Biomarkers*

13:00 – 13:15 > Clément Delacroix and *Marc Raynaud* | INSERM | *Potential role of big data analysis in personalizing congestion management*
13:00 – 13:15 > *Seraina Abele* | FHNW | *Role of Points of care diagnostics*

13:15 – 13:45 > Panel discussion

5 Speakers and Contributions

- **Luciano Potena**

Director of the Heart Failure and Transplant Unit at IRCCS AOU Bologna – Project Coordinator of BIOTOOL-CHF

Figure 2: Dr. Luciano Potena introducing the Workshop

Dr. Luciano Potena opened the workshop by introducing the BIOTOOL-CHF project and setting the scene for the discussions ahead. He provided an overview of the project's objectives, duration, and relevance within the European research landscape. He emphasized the central role of congestion in the progression of chronic heart failure, and the urgent need for personalized solutions to monitor and manage this condition. Dr. Potena also underlined the importance of building synergies across disciplines to improve patient care, encouraging the active involvement of all stakeholders present.

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- ## Jozine ter Maaten

Cardiologist and Assistant Professor, University Medical Center Groningen

Figure 3: Dr. Jozine ter Maaten

Dr. Jozine ter Maaten provided a compelling opening talk on the definition of congestion and its clinical relevance in chronic heart failure. She clearly illustrated why addressing congestion is essential to prevent worsening of the disease and reduce hospital readmissions. Dr. ter Maaten also stressed the growing need for personalised care, highlighting both achievements and gaps in current treatment approaches.

"We need new and better ways to lower the rate of rehospitalization of patients after acute manifestation of the heart failure disease."

"We are already moving towards a higher personalization of treatments, but we still have a long way to go."

• Finn Gustafsson

Professor of Cardiology, University of Copenhagen – Medical Director, Rigshospitalet, Copenhagen
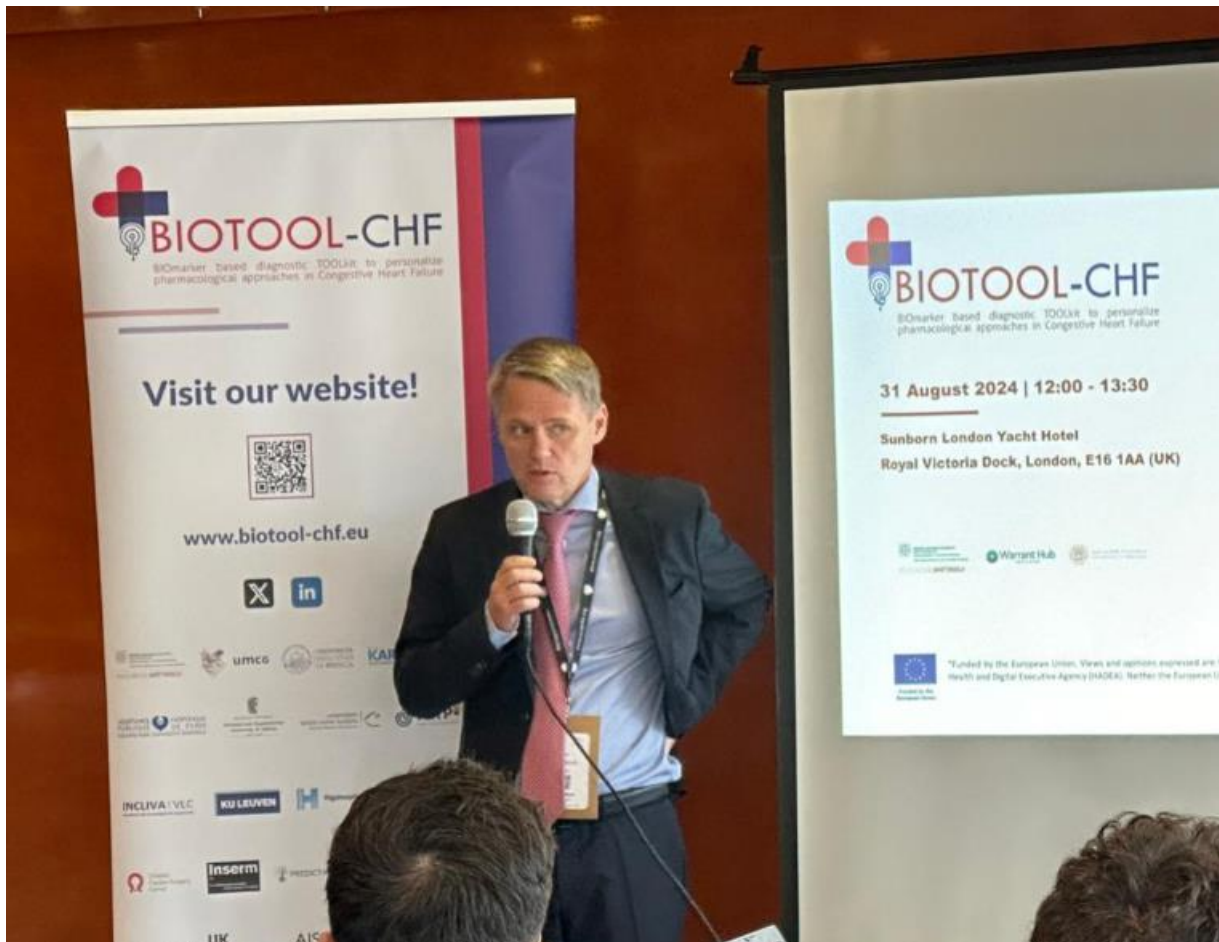

Figure 4: Prof. Finn Gustafsson

Prof. Finn Gustafsson focused his presentation on the role of implantable devices in monitoring congestion. He explained how dedicated technologies such as pulmonary artery pressure sensors are already contributing to better disease management, though interpretation of the data remains a challenge. He also discussed the potential of leveraging sensors embedded in other devices and emphasized the importance of improving accuracy and contextual understanding.

"We already have systems to monitor congestion, but we need a better understanding of what is monitored, and how it is related to the whole system."

"Projects that increase our ability to diagnose and monitor congestion will allow us to better manage the disease, increase the quality of life of patients, and ultimately also lower healthcare costs."

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- **Igor Diemberger**

Consultant Cardiologist, IRCCS AOU Bologna – Associate Professor, University of Bologna
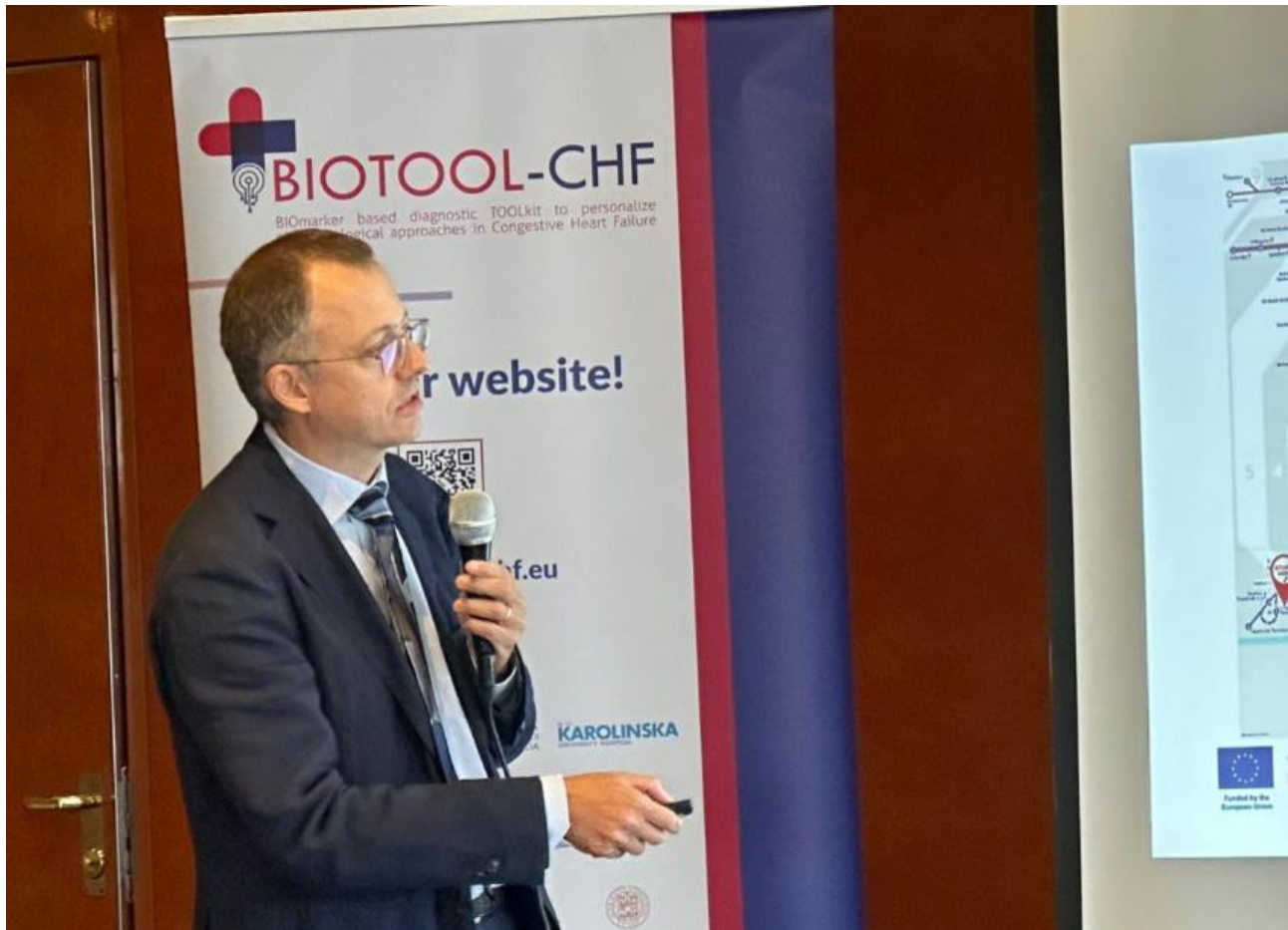

Figure 5: Prof. Igor Diemberger

Prof. Igor Diemberger offered a detailed overview of non-invasive devices currently used to monitor congestion in CHF. He explained how congestion is a complex, fluctuating condition that challenges traditional monitoring approaches, especially in outpatient settings. His presentation examined the pros and cons of available tools, emphasizing the importance of integrating these devices within broader care systems and validating their real-world effectiveness.

"Monitoring with non-invasive devices is part of a whole system that needs to be developed, with the aim to lower congestion in chronic heart failure."

"With non-invasive devices, we need to take into account all the factors that can affect monitoring."

Prof. Diemberger's technical expertise and leadership within the BIOTOOL-CHF consortium make him a key figure in the development of innovative diagnostic solutions for personalized CHF management.

- ## **Rafael de la Espriella**

Cardiologist and Heart Failure Specialist, Hospital Clínico Universitario de Valencia

Figure 6: Dr. Rafael de la Espriella

Dr. Rafael de la Espriella explored the growing role of biomarkers in assessing fluid overload and congestion in CHF patients. He reviewed the latest advancements in circulating biomarkers and advocated for a multiparametric, knowledge-driven approach to personalise treatment plans. His presentation provided a concise and up-to-date overview of current clinical tools and emerging diagnostic strategies.

"Congestion is a really difficult and dangerous part of the disease. We have several biomarkers to be monitored, but we need knowledge-based tools that allow us to use them in the most efficient way, to direct personalised treatments."

His work supports the core mission of BIOTOOL-CHF: to deliver a biomarker-based diagnostic toolkit that enhances treatment decisions in chronic heart failure.

- ## **Clément Delacroix**

Researchers, INSERM – Paris Transplant Group

Figure 7: Clément Delacroix

Clément Delacroix presented the transformative potential of big data in personalizing CHF care. He outlined how advanced statistical models can be applied to complex datasets to stratify patient risks and tailor treatment strategies. At the same time, he offered a critical view of the limitations of big data, including issues related to bias, data quality, and clinical applicability.

"Big data are powerful, but we need to know how to use it."

INSERM plays a pivotal role in BIOTOOL-CHF, contributing high-level data science expertise essential to the project's ambition to personalize CHF diagnostics through AI and data integration.

- ## Seraina Abele

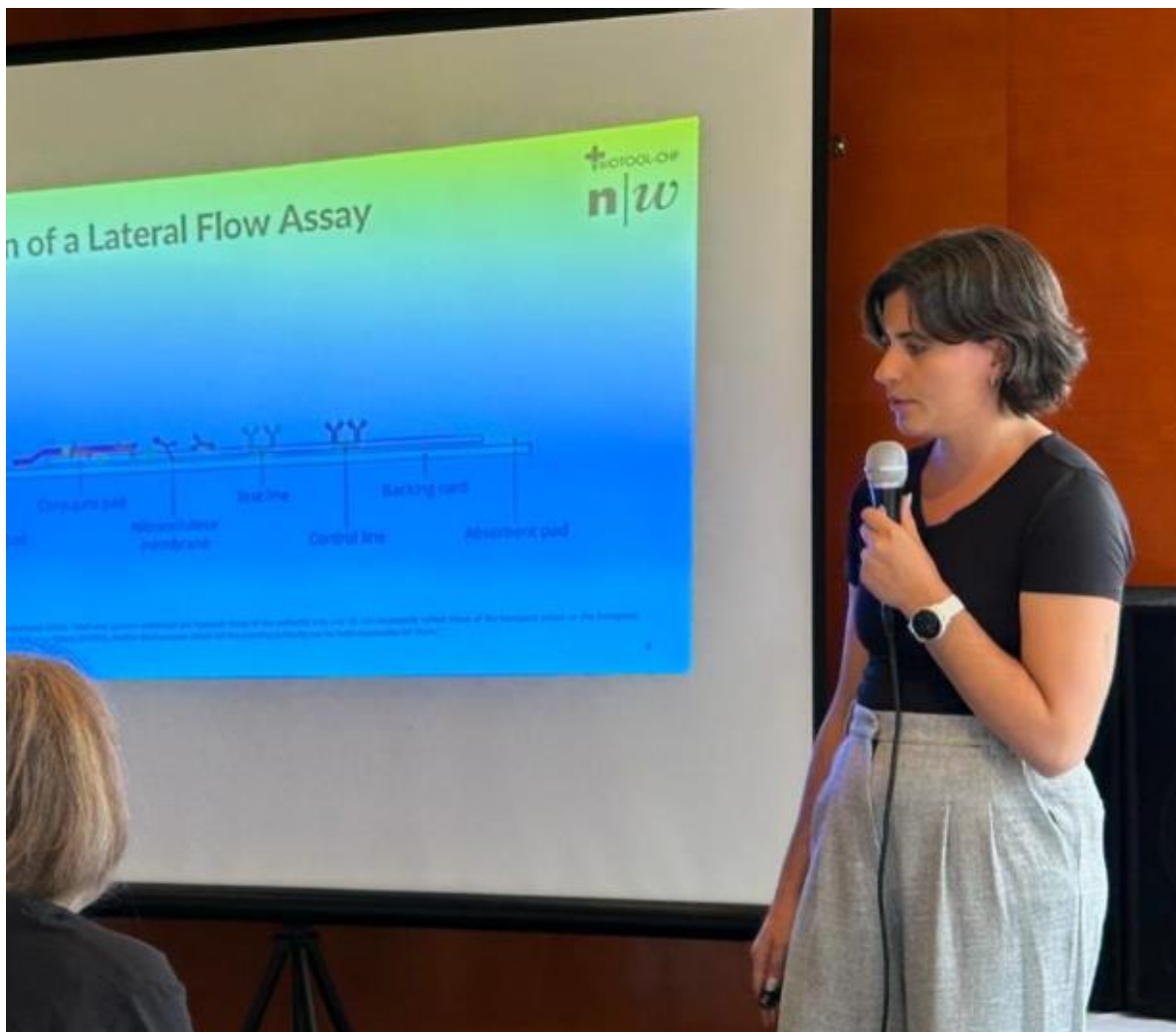*Researcher, FHNW - Switzerland*

Figure 8: Seraina Abele

Seraina Abele focused on the role of point-of-care (POC) diagnostics in enabling faster, decentralised clinical decision-making. Her presentation highlighted the critical steps required to bring diagnostic innovations from research to market, and the importance of aligning clinical needs with regulatory and commercial pathways.

"Many steps are required to take a diagnostic tool to the market."

Her contribution reflects BIOTOOL-CHF's commitment to not only developing effective technologies, but also ensuring real-world accessibility and usability.

6 Conclusions and Key Outcomes

The BIOTOOL-CHF workshop in London offered a valuable opportunity to reflect on current challenges and potential solutions in the diagnosis and monitoring of congestion in chronic heart failure. Through the contributions of clinicians, researchers, and technical experts, the workshop helped clarify the complexity of congestion as a clinical condition and the importance of improving how it is assessed and managed in routine care.

Key points emerged during the discussions:

- Congestion is still a major factor contributing to hospitalisations and worsening outcomes in CHF patients.
- Personalised care requires better tools to support clinical decision-making, including validated biomarkers, invasive and non-invasive monitoring devices, and data-driven approaches.
- A multiparametric strategy is crucial to achieve effective personalised treatment. Multiple biomarkers could be associated with parameters recorded by devices
- In addition, a careful data-driven approach is needed: current statistical methodology is very powerful, but also very much exposed to bias related to the quality of data.
- Translating research into practice involves addressing regulatory, technological, and clinical integration challenges.

By taking place alongside the ESC Congress 2024, the event facilitated interactions with a broader community of cardiovascular professionals, and with representatives of device/diagnostic industry. The outcomes of the workshop will support the ongoing work of BIOTOOL-CHF, particularly in refining the design and implementation of a biomarker-based diagnostic toolkit for personalised management of chronic heart failure.