NEWSLETTER

SOCIEDADE PORTUGUESA DE BIOQUÍMICA

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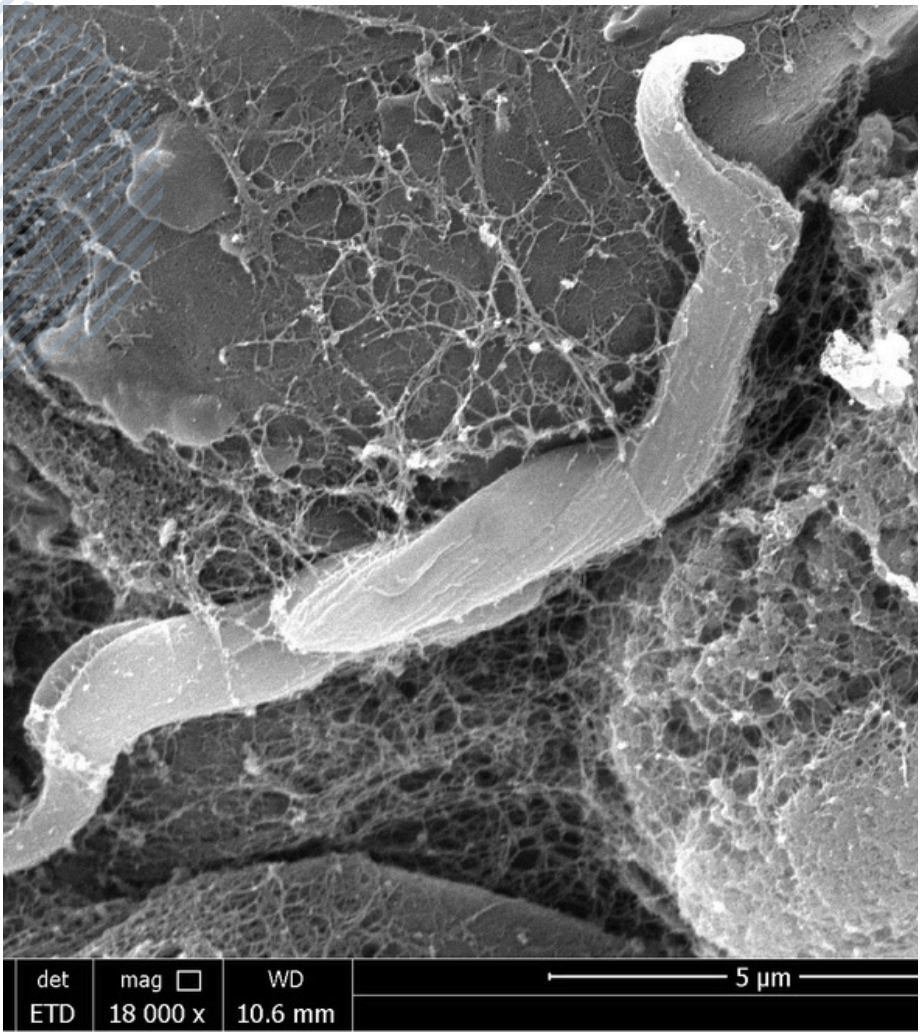


Two parasites of the species Trypanosoma congolense *adhered to bovine endothelial cells (scanning electron microscopy)*

Sara Silva Pereira,
Católica Biomedical Research Centre, in collaboration with the Microscopy facility of the International Iberian Nanotechnology Laboratory

IN THIS EDITION

Editorial

Awards & Distinctions

Interview

News & Views

SPB Junior Section

Calendar & Events

Editorial

5th Edition

In this Edition:

This issue of the SPB Newsletter highlights key moments from the SPB 2024 Congress, including the SPB career Award to Miguel Seabra, the SPB Education Award to Pedro Moradas Ferreira, the FEBS Education National Lecture Award to Thomas Lancaster, and best communication awards to several students.

It also features the FEBS Booster Fund 2024 awards granted to two SPB members. Additionally, Miguel Castanho, from the University of Lisboa, shares reflections on his academic journey, motivations, challenges, and contributions to SPB, IUBMB and PABMB.

Morevoer, Célia Antunes, from the University of Évora, and Aureliano Alves, from the University of Algarve, give us their perspectives on the bright future of Clinical Biochemistry.

The newsletter also highlights the symposium organized by the SPB Junior Section in the XXII National Congress of Biochemistry, as well as upcoming events, including YSF2025 and the 29th FEBS congress.

We extend our warmest wishes to all SPB members of joyful holidays and a prosperous New Year!

The SPB Directive Committee

Awards & Distinctions

Miguel Seabra, Full Professor at NOVA Medical School, Universidade NOVA de Lisboa, received the **SPB Career Award**.

The ceremony took place on October 24th, after his lecture at the XXII SPB National Congress of Biochemistry, in Aveiro.

Miguel Seabra made seminal contributions to the Biochemistry and Biomedicine fields and was the founder of two biotech companies. His leadership and vision were dedicated to the advancement of Portuguese science and post-graduate education, as President of Fundação para a Ciência e a Tecnologia and Coordinator of the Gulbenkian PhD program in Biomedicine, respectively.

He was also the founder and Coordinator of the Chronic Diseases Research Center (CEDOC) of NOVA Medical School, Universidade NOVA de Lisboa, shaping the landscape of Portuguese biomedical research.

Miguel Seabra

Pedro Moradas Ferreira, Full Professor at ICBAS, University of Porto, received the **SPB Education Award**.

The ceremony took place on October 25th, during the Symposium on Biosciences education at the XXII SPB National Congress of Biochemistry, in Aveiro. Pedro Moradas Ferreira made significant contributions to the academic and scientific development of Biochemistry at the University of Porto.

He was instrumental in establishing the Degree in Biochemistry (1981/82) and the Master in Biochemistry (2007/08), laying a strong foundation for advanced education in the field.

Pedro Moradas Ferreira

A pioneer in adopting problem-based learning strategies, he enhanced teaching methodologies and inspired innovative approaches to education. Beyond academia, he actively promoted Biochemistry through the organization of symposia and congresses, and by serving on the SPB board of directors.

Thomas Lancaster, Principal Teaching Fellow at the Imperial College London, UK, received a **FEBS Education National Lecture Award**. The ceremony took place on October 25th, after his lecture in the XXII SPB National Congress of Biochemistry, in Aveiro.

Thomas Lancaster

Helena Laronha (University of Aveiro), received the **SPB Best Poster communication award** at the XXII SPB National Congress of Biochemistry, for her work on "Assessment of cholesterol-lowering effects of Portuguese mushrooms".

Inês Castro-Almeida (i3S, University of Porto) received the **SPB Best Oral communication award** at the XXII SPB National Congress of Biochemistry, for her work on "AHR on T(AHR)get: Dissecting the Impact of Aryl Hydrocarbon Receptor Modulation in Disease and Therapy".

Helena Laronha

Tiago Coutinho (UTAD) received the **SPB Junior section Best Oral communication award** at the XXII SPB National Congress of Biochemistry, for his work on "Assessment of the antioxidant, safety profile and anti-inflammatory activity of two flavonoids: taxifolin and silybin"

Tiago Coutinho

Inês Castro-Almeida

Bruno Ribeiro (University of Porto) received the **SPB Junior section Best Poster communication** award at the XXII SPB National Congress of Biochemistry, for his work on "Harnessing photosynthetic electrons to exploit the cyanobacterium Synechocystis as a cell factory".

Sara Silva Pereira (Católica Biomedical Research Centre, Oeiras) received a **FEBS Booster Fund 2024 award**, for her research on "How parasites interact with blood vessels".

Nuno Dinis Alves (ICVS, University of Minho) received a **FEBS Booster Fund 2024 award**, for his research on "Serotoninergic circuitries in the healthy and in the 'stressed' brain".

Nuno Dinis Alves

Bruno Ribeiro

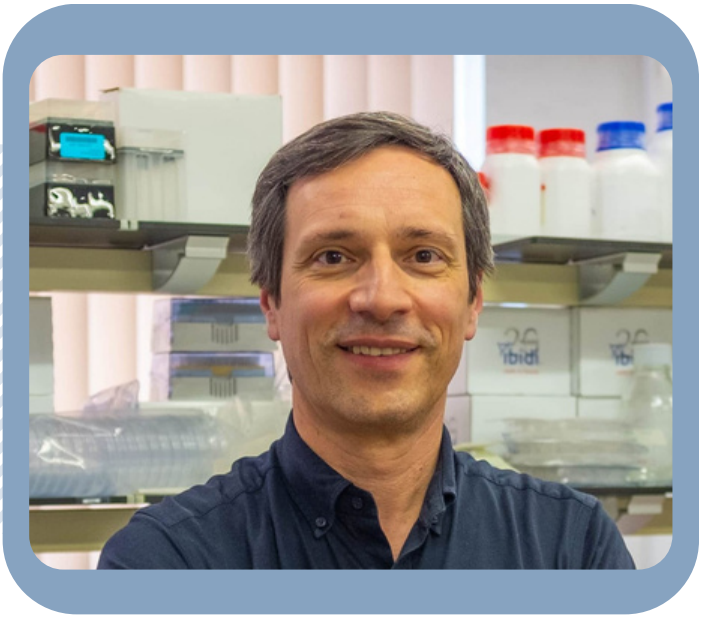
Sara Silva Pereira

Interview

Miguel Castanho

Carlos Farinha (University of Lisbon) spoke with Miguel Castanho, former president of SPB (2009-2012), Full Professor at the Faculty of Medicine of the University of Lisboa (FMUL), and group leader at the newly created Gulbenkian Institute for Molecular Medicine.

The interview reflects Miguel Castanho's passion for biochemistry, his interdisciplinary approach to the field, dedication to research and education, and commitment to advocating for biochemistry in Portugal through leadership roles in national and international scientific organizations.



Can you give us a brief overview of your academic and scientific career?

My professional journey started with a degree in biochemistry at the Faculty of Sciences of the University of Lisboa. I was initially interested in medicine but chose biochemistry due to a strong passion for scientific research.

I was particularly pleased with the experience of multidisciplinarity and by the close-knit student-teacher environment that provided us with a broad foundation across various scientific fields. For my undergraduate internship, I opted for the Department of Chemical Engineering at Técnico [Instituto Superior Técnico], which was unconventional but allowed me to explore my interest in physics and mathematics.

I eventually completed a PhD in Chemical Engineering, focusing on spectroscopy and instrumental analysis, and later transitioned to teaching analytical chemistry at the Faculty of Sciences.

Despite initially moving from biochemistry to chemical engineering, I remained comfortable with this apparent career shift, enjoying the work in structural spectroscopy. I progressed from intern assistant to assistant professor after completing my PhD and began my teaching career in the field of chemistry. My research work, however, continued in the realm of biochemistry, particularly focusing on peptides—a bridge between chemistry and biochemistry. As peptides are like small proteins or large organic molecules, they have a great appeal due to their conformational dynamics and potential medical applications. I later became Full Professor of biochemistry at the Faculty of Medicine of the University of Lisboa and continued my research on peptides, focusing on a more medical perspective.

What has motivated you to Biochemistry and specifically to your area of research?

From childhood, I was fascinated with biology and nature. Over time, this interest evolved into a curiosity about the unseen world inside cells, which led me to biochemistry.

I was particularly drawn to biochemistry's interdisciplinarity, as it integrates mathematics, physics, chemistry, and biology. This broad approach enabled me to find my path in physical biochemistry and to carve out my own research areas and topics.

What has been your most surprising/exciting discovery?

One of the most intellectually satisfying discoveries was demonstrating that the interaction between peptides and bacterial membranes, a biological system, could be described using the same quantitative, mathematical framework as interactions with artificial lipid vesicles. This achievement created a bridge between pure physical chemistry and bacterial biochemistry, bringing together two previously separate fields in a meaningful way.

What is (or has been) the major challenge throughout your academic career?

Although we face several challenges, probably the major one is the difficulty of maintaining consistency and depth in scientific research in a system that requires constant diversification to secure funding. In ecosystems like ours, researchers are often forced to switch topics frequently to align with available funding, which prevents them from pursuing long-term research that could lead to significant breakthroughs.

This in fact different from systems with continuous opportunities, where researchers can dedicate their entire careers to a single line of work, often resulting in significant discoveries, such as those recognized by Nobel Prizes. So, the key challenge is to build an ecosystem that supports sustained research over time.

What has meant to you to be SPB President?

My experience as president of SPB was enriching, particularly because it allowed me to work closely with various people in the field and gave me a broader perspective on biochemistry in Portugal. SPB is quite relevant in the promotion of biochemistry in Portugal, building connections with international organizations like FEBS [Federation of European Biochemical Societies], and enhancing the visibility of Portuguese biochemistry on the global stage.

SPB's work is often behind the scenes, with efforts to secure better funding, representation, and visibility for Portuguese researchers at international events and in decision-making bodies. This behind-the-scenes work, while essential, is not often recognized or appreciated, but it plays a critical role in ensuring that Portuguese biochemistry is represented and has access to opportunities at an international level. Without this presence and advocacy, countries risk being overlooked in the allocation of resources and opportunities.

What is the relevance of participating in FEBS activities and committees?

I consider particularly important the participation in FEBS and similar organizations like IUBMB [International Union of Biochemistry and Molecular Biology] and PABMB [Pan-American Association for Biochemistry and Molecular Biology].

These organizations have significant financial resources and the power to influence political decisions on which research/innovations areas deserve investment. For this reason, it is crucial for Portugal to have representation in these organizations to ensure that Portuguese biochemistry receives the support and visibility it deserves.

News & Views

The future is bright for Clinical Biochemistry!

Célia Antunes, Department of Medical and Health Sciences, School of Health and Human Development, University of Évora.

Aureliano Alves, Faculty of Sciences and Technology, University of Algarve.

The burden of disease varies with geography worldwide in relation to the economical-social-demographic context; while countries in development are more affected by infectious diseases, non-communicable disease poses the highest challenge in developed countries [1].

Clinical biochemistry plays a crucial role in diagnosing, managing, and understanding the pathophysiology of both communicable and non-communicable diseases. Research in this field contributes to uncover the underlying biochemical processes and provides insight into more effective ways to detect, monitor, and treat diseases, acting on 5 major areas (Fig. 1, upper pannel):

1. Biochemical Mechanisms of Chronic Diseases, focusing on identifying and understanding underlying biochemical changes, such as: inflammation and immune response; metabolic dysfunction; and oxidative stress and antioxidant systems.

2. Biomarkers for Early Diagnosis and Monitoring, where clinical biochemistry is instrumental in developing biomarkers, in blood, urine, saliva or tissue samples, to early detect chronic diseases and monitor their progression.

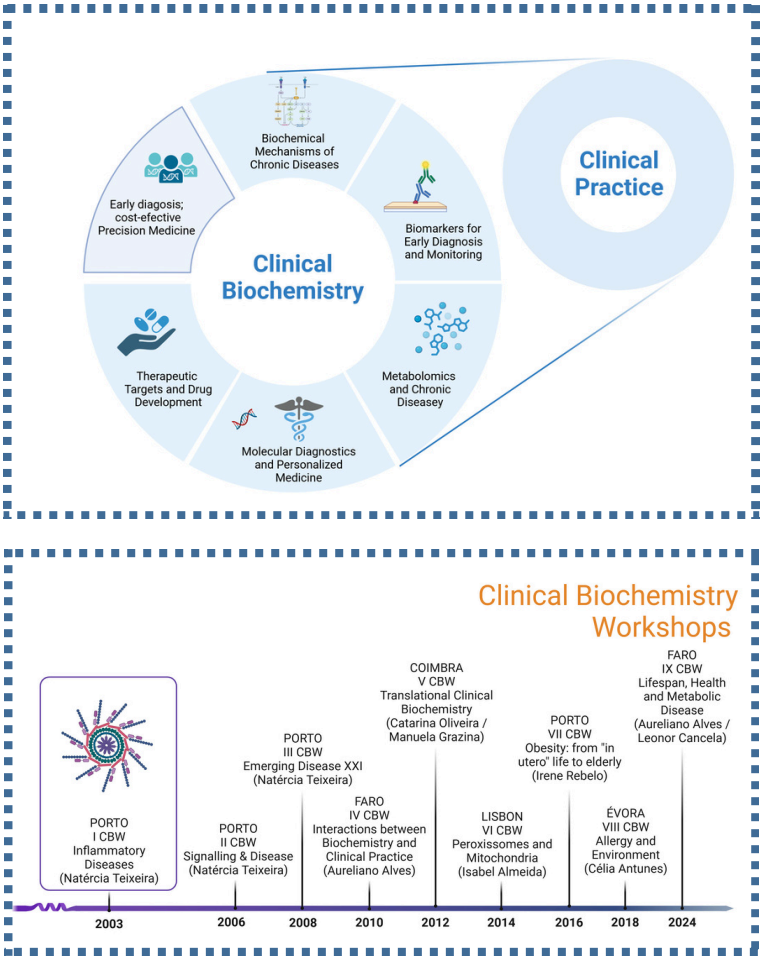


Figure 1: Clinical Biochemistry entanglement with clinical practice (upper panel) and the timeline for SPB Clinical Biochemistry Workshops (lower panel). Created with BioRender.

3. Molecular Diagnostics and Precision Medicine, aiming at delivering tailored medical treatments to individual patients based on their unique disease pathways, through genetic and biochemical profiles.

4. Metabolomics and Chronic Disease, analysing metabolic changes, to identify disease-specific metabolic signatures, promising for early diagnosis and understanding disease progression of highly prevalent chronic disease, such as diabetes and obesity, cancer, cardio-vascular disease and neurological diseases.

5. Therapeutic Targets and Drug Development, identifying new therapeutic targets for chronic diseases, developing novel drugs targeting specific biochemical pathways [2].

The Clinical Biochemistry thematic group (CBG) of the Portuguese Biochemical Society has contributed over the years to promote the research and bring together the national and international researchers to discuss new findings.

Within CBG's scope, the first Clinical Biochemistry workshop (CBW) was promoted by Professor Natércia Teixeira in 2003 at the University of Porto. At this University, 3 more workshops took place (2006, 2008 and 2016). At the University of Algarve, Professor Aureliano Alves promoted the interaction between the biochemistry and the clinics with the organization of 2 workshops in 2010 and the last one in 2024. Others CBWs occurred in Coimbra (2012), Lisbon (2014), and Évora (2018) in a total of 9 workshops in about two decades.

The numbers of participants at the CBW are clearly increasing. In the last CBW (2024), at the Algarve University, 135 participants (20 online), being a large majority students, followed a very complete program with a total of 28 oral and 25 poster communications. These interdisciplinary CBWs aims to bring together professors and young researchers from the scientific community who enhance the interaction between Biochemistry and Clinics.

In fact, at these CBWs, young researchers have an excellent opportunity to present their most recent discoveries on topics such as aging, health and metabolic diseases with an emphasis on neurological, cardiovascular diseases and diabetes, and environment driven disease, among other fields of clinical biochemistry, following actual research challenges (fig. 1, lower panel).

In summary, while significant progress has been made in understanding the biochemical underpinnings of chronic diseases, there are still several challenges in clinical biochemistry research:
i) the complexity of chronic diseases, multifactorial and involving a combination of genetic, environmental, and lifestyle factors, requiring an omics approach;
ii) rare and emergent diseases, still poorly understood;
iii) emergent pandemics, where early detection and vaccination are cornerstone in prevention.

Moreover, despite the advances in biomarkers, early detection of many chronic diseases (especially cancers) remains a challenge and finding more sensitive and specific biomarkers for early diagnosis is crucial.

Finally, although there is great potential in precision medicine, translating biochemistry research into widely accessible and cost-effective treatments remains a hurdle.

References:

1. World Health Organization (WHO), https://www.who.int/, 15 December 2024.

2. Mannello F. and M. Plebani. Current Issues, Challenges, and Future Perspectives in Clinical Laboratory Medicine. J. Clin. Med. 2022, 11, 634. https://doi.org/ 10.3390/jcm11030634.

SPB Junior Section

"Biochemistry in Motion: Driving Practical Applications for Society and Sustainable Development Goals through Innovative Product Design"

The Junior Section of SPB organized the symposium "Biochemistry in Motion: Driving Practical Applications for Society and Sustainable Development Goals through Innovative Product Design" at the XXII National Congress of Biochemistry. The session featured the active participation of young researchers and explored how biochemistry can drive solutions aligned with the Sustainable Development Goals, emphasizing the creation of innovative products.

The invited speaker, Fadhil Musa, presented DeloxHP technology, which revolutionizes sterilization with hydrogen peroxide, offering a more effective, safe, and sustainable solution.

The symposium showcased three oral presentations, two flash talks and ten posters, covering topics such as sustainability, biotechnology for innovative food products, antimicrobial and therapeutic applications, highlighting the emerging talent of young scientists.

Bruno Ribeiro (University of Porto) received an honorable mention for best poster, while Tiago Coutinho (University of Trás-os-Montes and Alto Douro) won the award for best oral presentation, sponsored by Alfagene. This symposium stood out for its relevance and the exchange of ideas that promote innovation and the social impact of biochemistry. Additionally, the Junior Section hosted a booth to attract new researchers to its initiative.

Calendar & Events

26-28/02

XIX Iberian Peptides Meeting (EPI)
Santiago de Compostela, Spain
LINK

28/02 to 02/03

Education Workshop on Safe Learning: Bridging the Gap Between Learning Partners
Izmir, Turkey
LINK

20 - 22/03

HSR Congress 2025: From Molecule to Community
University of Beira Interior, Covilhã, Portugal
LINK

18- 23/05

31st FAOBMB Conference & 2025 KSBMB International Conference
Bexco Busan, South Korea
LINK

01 - 04/07

Iberian Plant Biology - 2025 Congress
Murcia, Spain
LINK

02-05/07

24th FEBS Young Scientists' Forum (YSF) 2025
Sapanka, Turkey
LINK

05-09/07

29th FEBS Congress
Istanbul, Turkey
LINK