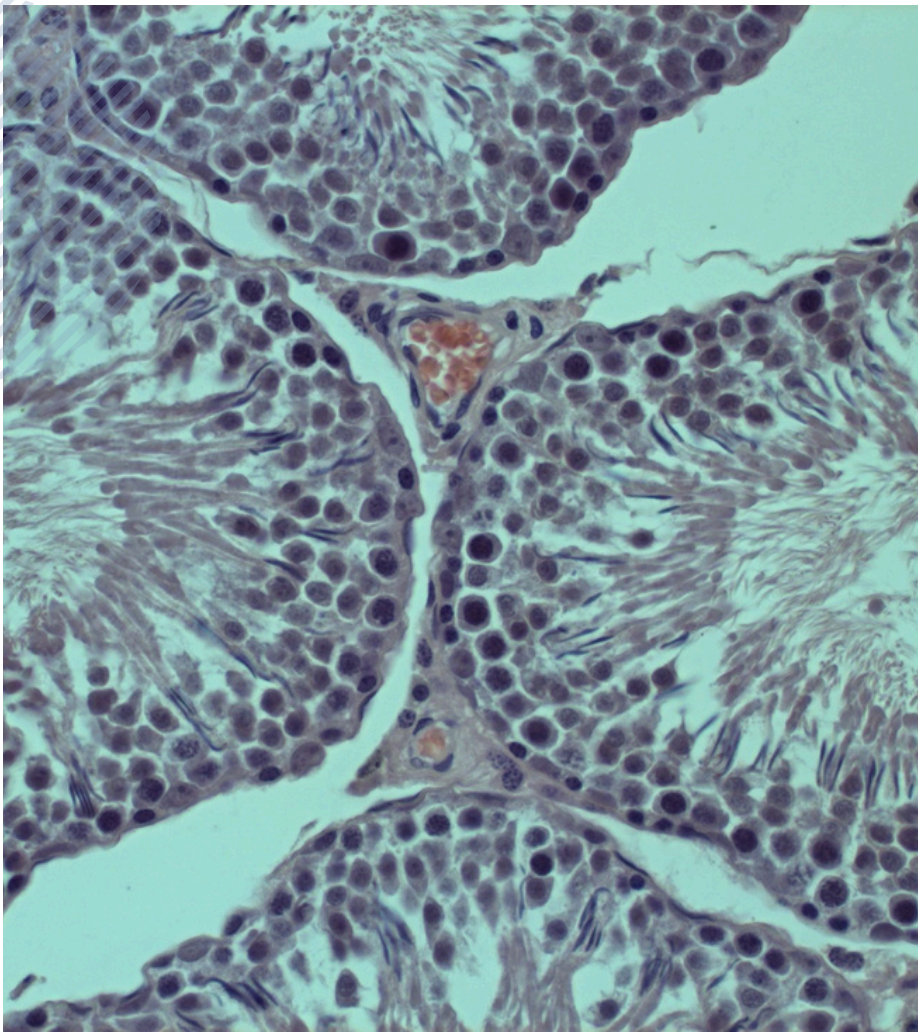
NEWSLETTER

SOCIEDADE PORTUGUESA DE BIOQUÍMICA

March 2024

Edition 2



Histomorphology of rat testis tissue with seminiferous tubules surrounded by the basal lamina.

Bárbara Matos and Margarida Fardilha
iBiMED, University of Aveiro

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Editorial & SPB Junior Section

2nd Edition

In this Edition:

In the second issue of the SPB Newsletter, we highlight SPB activities that took place in the first trimester of 2024, namely the first event organized by the recently created SPB Junior Section and the IX SPB Clinical Biochemistry Workshop, and the awards received by a SPB member, Vitória Baptista from the University of Minho.

Looking ahead, we emphasize several upcoming events, including the National Congress of Biochemistry, the FEBS meeting, and celebratory activities marking the FEBS 60th anniversary, as well as other SPB and FEBS opportunities.

In addition, Leonor Cancela from the University of Algarve tells us about her academic career, scientific activities and invaluable contributions to scientific societies, including SPB. Moreover, Manuel João Costa from the University of Minho shares his insightful perspective on Teaching and Learning in Molecular Life Sciences.

We send our warmest Easter wishes to all members of the SPB community!

The SPB Directive Committee

SPB Junior Section

The Junior Section of SPB is composed of Portuguese young members focused on directly capturing the interest and needs of students and young researchers. For 2024, the team aims to:

- Promote outreach in person activities and online research seminars and career-related workshops (to be announced);
- Provide information about scholarships, conferences, and careers in academia, inspiring a new generation of professionals and promoting personal growth and opportunities;
- Collaborate in the Portuguese National Congress of Biochemistry.

You can find more information about the Junior Section of SPB (**LINK**).

As part of the FEBS Junior Section activities, the SPB Junior section organized the Webinar "Neuroimmune Ecosystems", by Henrique Veiga-Fernandes, from the Champalimaud Foundation, Portugal, on March 14, 2024.

Awards & Distinctions

Vitória Baptista

PhD student in Biomedical Engineering at the Centre of Microelectromechanical Systems (CMEMS) and Life and Health Sciences Research Institute (ICVS), University of Minho, has been awarded an "**EMBO Scientific Exchange Grant"** and a **"FEMS Training and Research Grant**".

This will support her research in the malaria parasite biology, with a specific focus on studying protein-protein interactions under the guidance of Ángel Vizoso-Vázquez (Univ. Coruña, Spain).

Vitória aims to unravel the complexities of the essential heme detoxification pathway in the malaria parasite, shedding light on the structure and conformational dynamics of key proteins.

This research, besides contributing to technical/scientific knowledge transfer, holds the potential to deepen her understanding of the heme detoxification pathway and may provide a repertoire of valuable targets for the development of new malaria therapies.

My biggest achievement more than any award is contributing in a winning cause for my team.

Ravindra Jadeja

Interview

Leonor Cancela

Aureliano Alves (University of Algarve) talked with Leonor Cancela, Full Professor at the Faculty of Medicine and Biomedical Sciences, University of Algarve.

Can you tell us about your scientific career?

My scientific career has been always linked to bone biology and genetics.
My undergraduate/graduate studies took place at the University Paris VI- Pierre et Marie Curie and my PhD project was developed at INSERM/ Hôpital Lariboisière, in Paris. While developing my PhD in the Rheumatology service of the Hôpital Lariboisière, I implemented the methodology for measuring vitamin D metabolites in blood of patients and in animal models.

Those measurements became routine in the clinical laboratory where I worked and were also used in the PhD project, focused on vitamin D and calcium metabolism during pregnancy and lactation.

I was awarded my PhD in 1985 with honors. I was then offered a position at the University of California in Riverside, USA, in Professor Tony Norman lab, at the department of Biochemistry, and awarded a fellowship by the Philippe Foundation (01-1986/88).

There I continued to work on vitamin D metabolism and on the first genes identified as targets of vitamin D, including calbindin 28K, contributing to identify the binding site of the vitamin D receptor. Two years later, I was offered a position in the laboratory of Professor Paul Price at the University of California San Diego, (02-1988/10-1992), where I worked in a recently discovered vitamin K dependent (VKD) protein of unknown function, matrix Gla protein.

I was responsible for cloning the human gene and identified its localization in the human chromosome 12p (1990), being later associated to the first draft of the human genome. In addition, it paved the way to later studies aiming to identify the function of MGP as a potent physiologic calcification inhibitor.

In December 1992, I returned to Portugal and initiated my career as Assistant Professor at the University of Algarve, where I implemented my laboratory in animal molecular and cell biology in 1994 and taught the first classes of molecular biology in the degrees of Marine Biology and Biochemistry. In 2006, I became full professor. My work continued to focus on bone metabolism and vitamins D & K and my group became known for its pioneer work on studies related to identification and regulation of bone related VKD proteins from non mammalian organisms, identification of their evolutionary relationship and validation of fish as models to study bone metabolism and skeletal development in health and disease.

What were your main scientific contributions?

We were the first to develop bone cells lines from non-mammalian models and contributed to optimize methods to identify fish skeletal malformations during development, identify nutrients of interest to prevent/ decrease the incidence of skeletal defects and investigate some of the pathways leading to these deformities.

In the last few years, the group has developed methodologies to use zebrafish to screen for osteoactive molecules of interest, to identify osteotoxic compounds and to use mutant and transgenic zebrafish as models to study the molecular pathways of human diseases, in collaboration with national and international partners (Paget disease of bone, MEF2C, Holt-Oram, Keutel and CDKL5 rare syndromes). In 2024 the laboratory celebrates its 30 years (**LINK**).

During these past 3 decades we have contributed to international databases with genomic, RNA and protein sequences, to international cell repositories with new cell lines and developed bioinformatics tools freely available to the scientific community.

More recently, members of the group have also invested in projects on cellular agriculture, a nascent scientific discipline, and obtained substantial funding. In addition, I have also coordinated over 150 undergraduate, PhDs and postdoctoral fellows, published over 200 articles in international journals, 15 book chapters, and was co-author of 7 patents and 3 registered marks.

I must also acknowledge the fantastic group of research students, post docs and collaborators that accompanied me throughout those years, without whom all those achievements would not be possible.

Other contributions that you would like to mention?

As part of my interest in teaching and science dissemination, I implemented in 2008 the Lab.it project to provide training in molecular biology to high school students and teachers and disseminate research results through seminars and hands-on activities in schools using a lay approach (**LINK**).

What about your contributions to scientific societies, namely to SPB?

As member of the Portuguese Biochemical Society, I have organized workshops, meetings and seminars and was elected President between the years 2005-2008. I am also member of the board of the Portuguese Society of Genetics since 2010, and was elected President in January 2020 till present.

I believe that scientific societies have broad objectives, being important to support and promote the dissemination of scientific knowledge but also to develop activities relevant for the Society, at large, serving as crossroads of different areas of knowledge and contributing to the scientific literacy of the general population.

News & Views

Navigating the Education Maze: Exploring the Dynamic Landscape of Teaching and Learning in Molecular Life Sciences.

Manuel João Costa, School of Medicine, University of Minho.

Becoming a skilled biochemistry educator for a molecular life sciences researcher may seem simple at first: just join a course teaching team. However, the reality is far more nuanced. There exists no singular, simplistic solution to the multifaceted challenge of making yourself into an expert teacher.

While excellence in research and teaching within the same domain are frequently linked, they are not guaranteed to correlate to great extents. Since molecular life science instructors often start out as scientists, it's important to navigate the educational transition between the two roles and examine the associated challenges and opportunities.

"Biochemistry education" or "molecular life sciences education" aren't as established as disciplines like "biochemistry" or "molecular biology." These latter fields rely on scientific evidence and an active community to address gaps in knowledge and tackle modern challenges. The molecular life scientists community makes evidence-based decisions to advance the field. In contrast, education in these disciplines lacks well-established evidence or a comprehensive understanding community. Educators in these areas typically focus on teaching rather than producing evidence, aiming to help students overcome obstacles and grow personally.

Because education is often valued less than research, biochemistry teachers may not dedicate enough time to educational research, hindering the field's progress. However, as education is a primary mission of universities, their role in inspiring students to pursue research careers in biochemistry is invaluable.

Numerous studies have proven the high effectiveness of active learning approaches. In today's digital world, it's crucial to learn how to digitally improve the student experience. This doesn't necessarily mean more work for teachers if students are viewed as partners in learning.

Augmented and virtual reality simplify visualizing the nano world for students. Artificial Intelligence helps automate tasks and inspires new ideas for both students and teachers.

However, it also emphasizes the need for assessment reform. In higher education, there's a need of experimentation with new teaching and learning approaches because information access tools and large language models are now widely available.

Teaching is a serious and complex task.

Whether you're new to it or already involved, simply relying on personal beliefs or past experiences, whether good or bad, isn't enough to ensure success as an educator. Ignoring established evidence in teaching is likely to lead to poor outcomes.

The concept of "evidence-based practice" is gaining importance in education, also in fields like biochemistry. Positive attitudes toward teaching don't guarantee quality teaching.

To excel as an educator, it's crucial to get training in educational approaches and actively engage in sharing experiences, such as participating in educational activities through professional societies.

For instance, FEBS, through the long-established education committee, and the recent "FEBS Education Education and Training Conference" (**LINK**), is a notorious example of commitment to improving education in molecular life sciences.

For me, learning to be an educator remains a rewarding exercise, even 27 years after my first experience. I am dedicated to ensuring that more colleagues experience the joy of teaching and to fostering a cohesive community that can establish molecular life sciences education as a scientific discipline.

Faculty development session at the University of Minho on designing activities in digitally enhanced active learning rooms © Nuno Gonçalves

TO LEARN MORE

- Active learning, effectiveness: Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the national academy of sciences, 111(23), 8410-8415.
- Active learning, inclusiveness: Theobald, E. J., Hill, M. J., Tran, E., Agrawal, S., Arroyo, E. N., Behling, S., ... & Freeman, S. (2020). Active learning narrows achievement gaps for underrepresented students in undergraduate science, technology, engineering, and math. Proceedings of the National Academy of Sciences, 117(12), 6476-6483.
- On using AR or VR in education: Garcia-Bonete, M. J., Jensen, M., & Katona, G. (2019). A practical guide to developing virtual and augmented reality exercises for teaching structural biology. Biochemistry and Molecular Biology Education, 47(1), 16-24.
- On using Artificial intelligence in education (**LINK**)
- On "students as partners" (**LINK**)

SPB activities

The IX SPB Clinical Biochemistry Workshop

Faro, January 26th, 2024

Report by Aureliano Alves, University of Algarve

The IX SPB Clinical Biochemistry Workshop was held on January 26, 2024, at the University of Algarve, Faro, within the scope of the Clinical Biochemistry thematic group of the Portuguese Society of Biochemistry. It was the second time in 14 years that this important Workshop on Clinical Biochemistry was held in Faro, after the IV edition (2010), chaired by Professor Aureliano Alves.

The IX Clinical Biochemistry Workshop follows previous successful Clinical Biochemistry symposia held in Porto (2003, 2006, 2008, 2016), Faro (2010), Coimbra (2012), Lisbon (2014), and Évora (2018).

This interdisciplinary event aimed to bring together professors and young researchers from the scientific community who enhance the interaction between Biochemistry and Clinics, to present their most recent discoveries on topics such as aging, health and metabolic diseases with an emphasis on neurological, cardiovascular diseases and diabetes, among other pathologies.

The 135 participants (about 20 online), being a large majority students, followed a very immersive program with a total of 28 oral and 25 poster communications.

The excellent quality of the communications and their research will certainly remain in the memory of the participants for the coming years, allowing for a broader application of Clinical Biochemistry in various fields as well as promoting the quality of life of future generations. In fact, that was the main purpose of the IX Clinical Biochemistry workshop.

The book of abstracts is available HERE.

IX SPB Clinical Biochemistry Workshop

Calendar & Events 2024

15/03 to 15/04

SPB action grants: organization of students Meetings, Workshops, Congresses or SPB Conferences.
LINK

Until 01/04

FEBS Summer Fellowships
LINK

01/04 to 01/07

FEBS Excellence Award application
LINK

Until 01/05

FEBS Booster Fund application
LINK

01/06 and 30/09

FEBS 60th Anniversary activities
Bio-Art Image Contest: "The beauty behind biological sciences" (**LINK**)
FEBS Letters Writing Contest: "Blueprints for the scientific society of tomorrow" (**LINK**)

26 - 29/06

23rd FEBS Young Scientists' Forum
Pavia, Italy
LINK

29/06 to 03/07

48th FEBS Congress
Milano, Italy
LINK

Calendar & Events 2024

Until 01/09

FEBS Advanced Courses 2025 applications
LINK

22 - 26/09

Biomolecular Horizons 2024 (IUBMB-FAOBMB-ComBio)
Melbourne, Australia
LINK

24 - 26/10

XXII SPB National Congress of Biochemistry
Chair: Margarida Fardilha (University of Aveiro).
Aveiro, Portugal
LINK

Open

FEBS National Lectures and FEBS 3+ Meeting applications (2024 and 2025)
LINK

3 months before starting date

FEBS Short-Term Fellowships
LINK