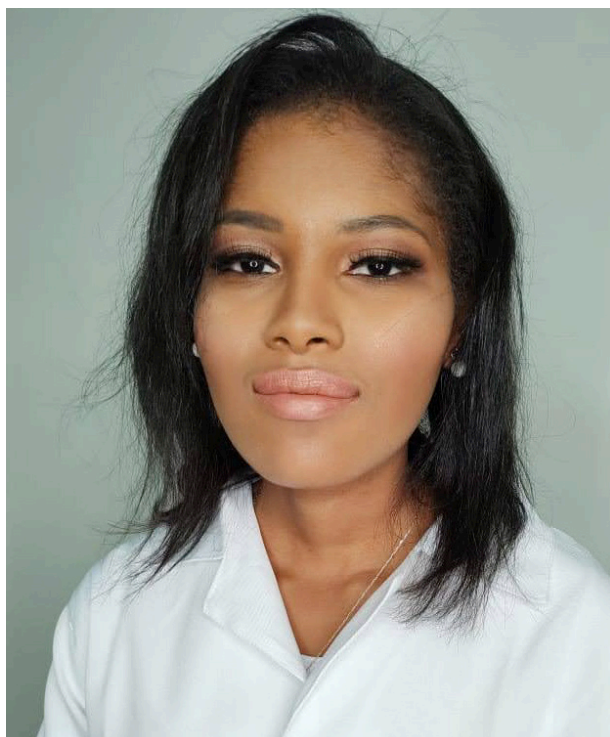


ISH COMMITTEE, PARTNER AND AFFILIATED SOCIETY REPORTS

COLLABORATION EXCHANGE SCHOLARSHIP REPORT

“The exchange profoundly influenced how I envision my future career”

ISH member Caroline Cristina Pinto Souza (Brazil) was one of two early career investigators to be awarded an ISH Collaboration Exchange Scholarship in 2025. The scholarships, each worth USD 5,000, were awarded to support the development of international partnerships which began at the 2024 ISH Scientific Meeting. For the scholarship, Caroline, based at the Institute of Biosciences, Botucatu, at Sao Paulo State University, was hosted by Ana Palei, based at the University of Mississippi Medical Center (UMMC) in Mississippi, USA. Here, Caroline and Ana share their reflections on the experience.



Caroline Cristina Pinto Souza

Throughout the final stages of my doctoral studies in the Post-Graduation Program in Biotechnology at the Institute of Biosciences, State University of Sao Paulo (UNESP), supported by the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) under grant 2022-07605-4, I undertook

a research exchange through the ISH scholarship at the University of Mississippi Medical Center (UMMC) in Jackson, Mississippi, United States.

From 1st August 2025 to 29th January 2026, I joined a multidisciplinary team led by Dr. Ana Palei, Associate Professor in the Department of Surgery, School of Medicine. Under her supervision, I focused on mechanisms of cardiovascular adaptations during pregnancy, particularly in relation to the RUPP (Reduced Uterine-Placental Perfusion Pressure) rat model, widely used to investigate preeclampsia.

Living and working in a new country for an extended period was both challenging and rewarding, becoming a transformative personal and professional experience. I had the opportunity to speak English in diverse settings, interacting with various accents and expressions, which enabled me to improve my fluency. Attending scientific meetings and being in multicultural environments also allowed me to practice my Spanish and French.

During this collaboration, I completed both online and in-person training and received certification from the UMMC's Institutional Animal Care and Use Committee (IACUC). I participated in a tour through the facilities of the Center for Comparative

Research (CCR), gaining deeper insight into how institutional protocols and ethical standards are applied. Observing the infrastructure behind intellectual work—the review of procedures and monitoring of animal welfare—enabled me to appreciate the precision, coordination, and responsibility required in translational research.

A major part of my work involved hands-on experimentation with animals. I assisted with tissue dissection, specimen weighing, blood centrifugation, sample sorting and labeling, and sterilization of surgical instruments. Involvement in these activities strengthened my technical skills. Likewise, I presented internal results, analysing morphological and hemodynamic variables, and contributed to discussions on the next steps in the project.

A key turning point was learning to analyze echocardiograms acquired with the VevoLab system, which elevated my comprehension of cardiac functional and structural assessments and broadened my competencies.

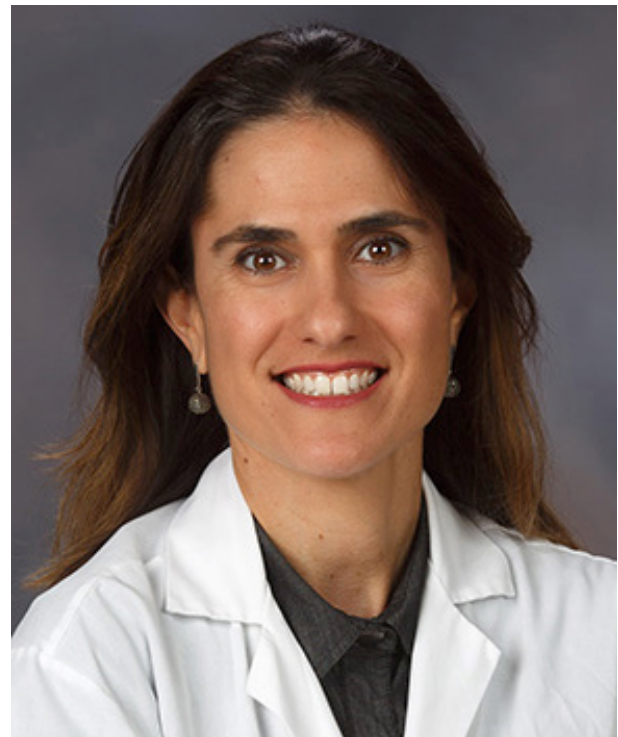
Additionally, we collaborated with Dr. David Stec's research team on kinomics analyses using Protein Tyrosine Kinase platforms and high-throughput gene chips to assess kinase activity and phosphorylation patterns in the heart and placental tissue from Sham pregnant and RUPP rat. This experience expanded my knowledge of molecular signaling pathways and introduced me to new evaluation of proteomics strategies.

Over the 6-month period, I participated in several scientific events, including the International Society for the Study of Hypertension in Pregnancy (ISSHP) Congress in Chicago (September 21-24) and the American Physiological Society Conference on "New Trends in Sex Differences and Women's Health Research" in New Orleans (October 23-25). At these events, I engaged with international investigators and presented data from my PhD study. Besides, I participated in seminars, including an online Preeclampsia series and Physiology sessions, as well as weekly laboratory discussions on experimental results and project management.

This exchange profoundly influenced how I envision my future career. It solidified my passion for public speaking and translating complex

concepts into more accessible language. It also sparked new ideas and boosted my enthusiasm for organizing events. I love discovering others' journeys and fostering growth in those around me. Science is a double-edged sword—constantly learning and teaching.

Looking ahead, we are working toward joint publications based on the data collected during my stay, with plans to continue our collaboration on kinomics analyses and preclinical studies. This experience has provided me with an international network of mentors and colleagues, which will undoubtedly shape my scientific path for years to come.



Ana Palei

Caroline is a PhD student under the mentorship of Dr. Valeria Sandrim. Dr. Sandrim and I used to work in the same laboratory in Brazil while pursuing our doctorate degrees in Pharmacology at the Ribeirao Preto Medical School (FMRP), University of Sao Paulo (USP). Since then, we have been collaborating in translational studies investigating pathophysiological mechanisms of preeclampsia. In 2024, I had the chance to meet and discuss Caroline's doctorate project on proteomics in preeclampsia during the ISH Congress in Cartagena, Colombia. Soon after

that, we developed a collaborative research project focused on proteomics in rat models of preeclampsia, which was selected for funding by the ISH Collaboration Exchange Scholarship.

Caroline spent 6 months in my laboratory collecting tissues and data from sham pregnant (control) and RUPP rats to then determine protein tyrosine kinase activity and phosphorylation patterns of peptides in the heart and placenta using the PamGene platform. We have selected these tissues because placental ischemia is an initiating event in the pathophysiology of preeclampsia. Moreover, preeclampsia is a significant risk factor for the development of cardiomyopathy during pregnancy as well heart failure and cardiovascular disease-related death postpartum. Thus, knowing which proteins are activated or inactivated in targeted organs may help us to elucidate the mechanisms underlying

cardiac and placental dysfunction associated with preeclampsia. Proteins identified by our study could serve as biomarkers for diagnosis, treatment, and prevention in preeclampsia.

Overall, I believe Caroline has benefited from this exchange program by engaging in innovative research and undergoing a well-rounded training in animal modelling of diseases and integrative cardiovascular physiology. She has improved her technical and communication skills, in addition to expanding her professional network. We plan to submit results stemming from this collaborative project for presentation at a scientific meeting and publication in an international peer-reviewed journal.

We are deeply thankful to the ISH for this opportunity!

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