



Founders Week

Researcher of the Year



Luana Colloca, MD, PhD, MS

School of Nursing

Professor, Department of Pain and Translational Symptom Science

Director, Placebo Beyond Opinions Center

Luana Colloca, MD, PhD, MS, first became fascinated with the placebo effect and pain management when she was in medical school.

“I was captivated by the brain’s functions, especially how little we know about its role in healing and how it influences the perception of pain-related symptoms,” said Colloca, professor, Department of Pain and Translational Symptom Science, University of Maryland School of Nursing (UMSON), and University of Maryland MPower professor.

At the same time, she was becoming concerned about the opioid epidemic and wondered if there was a way to reduce the overuse and misuse of opioids in pain treatment by identifying patients who need the treatments and others who may not.

“Some patients experience meaningful pain relief simply by expecting to be treated,” she said. “Placebo research has

become a valuable tool for understanding brain functions. It is also highly relevant for the development of new treatments because the identification of the appropriate control condition is so critical.”

This became the basis for Colloca’s work as she has conducted groundbreaking studies on the placebo phenomenon that have advanced scientific understanding of the brain’s ability to regulate the pain experience and led to the development of novel strategies to optimize therapeutic outcomes in clinical practice.

Colloca is an international expert in the fields of placebo effect and nocebo effect — the opposite of the placebo effect in which instead of having a positive response, patients have negative outcomes to treatments that cannot be explained by the treatments’ pharmacologic effects — and mechanisms of pain modulation. She has secured multiple National Institutes of Health awards, including several R01 grants and an R21 grant. For her pioneering work, Colloca has been named the University of Maryland, Baltimore (UMB) 2024 Founders Week Researcher of the Year.

Colloca’s body of research, published in more than 200 papers in high-impact medical journals and cited more than 19,000 times, is closely aligned with the strategic research priorities of UMSON and the broader mission of UMB, says Barbara Resnick, PhD, CRNP, FAAN, FAANP, professor, Department of Organizational Systems and Adult Health, Sonya Ziporkin Gershowitz Chair in Gerontology, and associate dean for research, UMSON, and Distinguished University Professor, UMB.

“Dr. Colloca’s research over the past 10 years at UMSON has significantly advanced the field of pain and translational symptom science,” Resnick said in nominating Colloca for the honor. “Her innovative studies on placebo effects, immersive virtual reality, and pain modulation have influenced clinical practice and public policy, providing new approaches to pain management that reduce reliance on opioid medications.”

Colloca’s work focuses on endogenous pain modulation mechanisms, patient expectations, and the learning processes that affect responses to treatments and overall health outcomes.

“When someone expects to receive a pain-relieving treatment, their brain may release substances like endorphins, which can actually reduce or even eliminate pain. These responses are rooted in specific neural and other biological mechanisms,” Colloca said.

Colloca’s key discoveries have included challenging the traditional framework of expectations versus conditioning as the primary explanation for the psychobiological mechanisms of the placebo effect, introducing observational, or social, learning as a trigger mechanism. Her work has also led to discovering that a neuropeptide — arginine vasopressin — is involved in pain modulation; understanding how dose-extending placebos can be harnessed to taper medications via pharmacological conditioning; and adding new genetic mechanisms as predictors of placebo effects.

Working in Baltimore has allowed Colloca to explore the interplay between disparities and placebo effects, researching why some people respond to placebo treatments while others do not.

“We’ve found that a combination of factors, including social disparities such as living in socioeconomically distressed neighborhoods and biological characteristics such as genetic influences play a role in these differing responses,” she said.

She also has translated some of the mechanisms of endogenous pain modulation into clinical applications that can be used for relieving pain-related outcomes.

“We demonstrated that the underlying mechanisms involved in virtual reality [VR]-induced pain reduction is due to a modulation of autonomic responses and mood regulation, which play a crucial role in VR’s action of increasing pain tolerance. We translated this knowledge into clinical applications,” she said. “For example, we have been providing VR headsets to patients with chronic pain at home, demonstrating that VR can improve clinical pain-related outcomes.”

Her lab is currently conducting projects, supported by the National Center for Complementary and Integrative Health, to uncover the neural mechanisms behind observation and socially induced analgesia.

“We are focusing on social learning, a field where observing benefits in others can shape outcomes in the observers,” she said.

Her lab also is researching predictors of placebo effects spanning gene expression in patients suffering from orofacial pain, supported by the National Dental Craniofacial Research, advancing the knowledge of this pain disorder and its management.

Placebo Beyond Opinions Center

Colloca serves as director of UMSON's Placebo Beyond Opinions Center, which is committed to advancing interdisciplinary research and education on placebo, nocebo, and expectation effects, with a focus on addressing disparities, improving design of clinical trials, educating future clinicians, and incorporating placebo knowledge into medicine.

Resnick said the center “has furthered interdisciplinary investigations into placebo phenomena locally and internationally and enhanced the educational landscape for future clinicians and researchers.”

Resnick also praised Colloca, who holds secondary appointments as professor in the Departments of Anesthesiology and Psychiatry at the University of Maryland School of Medicine, for remaining dedicated to mentoring and teaching. Colloca serves as the T32 pre- and postdoctoral training program director of the UMB Institute for Clinical and Translational Research's Clinical and Translational Science Award and mentors MPower scholars.

“Dr. Colloca has mentored numerous PhD students, postdoctoral fellows, and staff scientists, many of whom have gone on to achieve significant academic and professional success,” Resnick said.

Colloca said mentorship is an opportunity to shape the next generation of researchers and clinicians.

“When I mentor, I don't just pass on knowledge — I help to promote curiosity, critical thinking, and a sense of purpose,” she said. “It's incredibly rewarding to watch students grow and develop their own ideas and career paths. Our role as mentors is to help them gain the confidence to pursue their own research paths.”

She added that mentoring helps build a supportive community.

“It's important to show students that research is collaborative and their contributions are valued,” she said. “I hope to inspire students to approach their work with passion and perseverance, and to make meaningful contributions to their fields and contribute throughout education to a better society.”

A Love of Learning

Colloca said one of the reasons she enjoys research is because she loves to learn.

“I love thinking, searching, and discovering. In many ways, I find rest through my work,” she said. “Today, being a researcher goes beyond studying — it's about making a difference in how we think about pain management. It's also about inspiring others to get excited about research. I'm constantly amazed by the power of collaborative minds witnessing our collective creativity in action.”

She said she felt “a deep sense of joy and profound gratitude” when she learned she was named UMB Researcher of the Year, adding that she shares the achievement with those who have supported her: the School of Nursing, her team, and the UMB community.

“I feel humbled, grateful, and honored,” Colloca said. “I think of the colleagues who have contributed in various ways and the students who may now look to me and the other recipients as sources of inspiration for their own careers.”

— Jen Badie

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