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Q&A

Chem at 10: Shengqian Ma

A lover of travel and cooking, Shengqian Ma overcame career challenges by pioneering research grounded in extensive reading, critical thinking, and creativity. He advises young scientists to embrace passion, patience, perseverance, and problem-driven ambition. His teaching and mentorship foster independence and motivation. He anticipates transformative chemistry enabled by artificial intelligence and values *Chem*'s selective approach to publishing.

Biography

Shengqian Ma obtained his BS from Jilin University in 2003 and his PhD from Miami University in 2008. After completing a 2-year Director's Postdoctoral Fellowship at Argonne National Laboratory, he joined the Department of Chemistry at the University of South Florida as an assistant professor in August 2010. He was promoted to associate professor with early tenure in 2015 and to full professor in 2018. In August 2020, he joined the University of North Texas as the Robert A. Welch Chair in Chemistry and was appointed University Distinguished Research Professor in September 2025.

What would be a good non-scientific conversation starter with you?

Ask me about travel, and I am happy to share some stories and recommendations for the places I visited around the world. Or ask me about cooking. I started to cook when I was in elementary school.

What are some challenges you have faced throughout your career, and how did you overcome them?

I have faced different challenges at each stage of my career. When I began my independent career as an assistant professor, I faced the challenge of establishing a unique research program that differed from my PhD and postdoctoral research and could gain national and international recognition through high-impact publications and external funding. By midcareer, I faced the challenges of maintaining a leading position in the field and securing sustained funding to maintain and expand my research program. I addressed these challenges by drawing on extensive reading of the literature, critical thinking, and creativity to pioneer new research directions and lead their development in the field.



Shengqian Ma
Department of Chemistry, University of North Texas

What advice would you give to young and aspiring scientists beginning their research careers?

I'd like to offer three words to young scientists beginning their research careers: passion, patience, and perseverance. Passion means genuinely loving research; it goes beyond mere interest. Patience means recognizing that research cannot be rushed and that there are no shortcuts. Perseverance means not giving up when you encounter failures in research or obstacles along your career path.

In addition, I encourage young scientists to develop a big-picture ambition: to identify practical problems in society and use their knowledge and expertise to solve them. This mindset can help them adopt a research philosophy that is problem oriented, hypothesis driven, and grounded in rational design as they establish their own unique research programs.

What are some key aspects of your mentorship and teaching philosophy?

In terms of teaching, my goal is not only to teach course content but also to stimulate students' interest, increase their knowledge and understanding, encourage critical thinking, keep them up to date with the latest developments in chemistry, and motivate and equip them to learn independently so they can succeed in their future careers.

Regarding mentorship, my mission is to provide graduate students and postdoctoral researchers with rigorous, comprehensive research training while supporting their career development. I strive to create a dynamic environment that enables graduate students and postdocs to develop independence and strong teamwork skills. I supervise my students closely through weekly individual research meetings, daily discussions, and regular group meetings. This approach has proved effective in helping them learn to identify problems, formulate hypotheses based on scientific results, and design experiments that advance their research goals. I also encourage my students to think critically and creatively about each finding and to challenge themselves by tackling difficult research projects.

What exciting developments do you anticipate over the next 10 years, either in your specific field or in chemistry more broadly?

Over the next 10 years, I anticipate that research on porous materials will shift from discovering new structures to designing materials that can solve specific real-world problems. Advances in artificial intelligence and automated synthesis should greatly accelerate the

development of functional porous materials for task-specific applications in the recovery of critical materials and minerals, catalysis, clean-energy technologies, environmental remediation, and biomedicine. Moreover, the high designability and structural precision of metal-organic frameworks (MOFs) and covalent organic frameworks (COFs) could enable breakthroughs in our understanding of fundamental problems in biophysics, such as protein folding and unfolding and enzyme dynamics in confined and crowded environments.

More broadly, I expect chemistry to become increasingly predictive, automated, and sustainability driven. I also anticipate that integrating chemistry with data science, engineering, and biology will be particularly transformative.

How has your experience been with publishing and reviewing for *Chem* and with engaging with the journal's editors?

My experience as an author and reviewer for *Chem*, as well as my interactions with the journal's editors, has been very positive. I particularly appreciate that *Chem* is highly selective about the topics it publishes and that it limits the number of papers it publishes each year. I do not submit papers to *Chem* regularly, but before submitting each paper, I contact the journal's editor for feedback on its suitability, which I have found very helpful. Most of the papers we have published in *Chem* have been significant and impactful. For example, our work published in 2018 melded MOF chemistry with main-group catalysis and not only pioneered a new direction for the field but also offered enormous potential for applications in catalysis and beyond.

I have regularly reviewed for *Chem* and have thus far reviewed 50 papers. In each review, I have held myself to a very high standard. I look forward to reviewing more papers in the future.

DECLARATION OF INTERESTS

The author declares no competing interests.

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