

Young Career Focus: Professor Makeda Tekle-Smith (Columbia University, USA)

Background and Purpose. SYNFORM regularly meets young up-and-coming researchers who are performing exceptionally well in the arena of organic chemistry and related fields of research, in order to introduce them to the readership. This Young Career Focus presents Professor Makeda Tekle-Smith (Columbia University, USA).

Biographical Sketch



Makeda Tekle-Smith was born and raised in Santa Barbara, California (USA). She obtained her B.A. in chemistry at Pomona College (USA) in 2014. As an undergraduate, she investigated new anti-malarial compounds with Prof. Cynthia Selassie. She then obtained her Ph.D. with Prof. James Leighton at Columbia University (USA) in 2019. There she developed new methods to construct asymmetric C(sp³)-C(sp³) bonds and applied these technologies to the total synthesis of non-aromatic polyketide natural products. Makeda then went on to conduct her postdoctoral research with Prof. Abigail Doyle first at Princeton University (USA) and then at the University of California Los Angeles (USA). Makeda's postdoctoral work focused on generating and harnessing reactive radical intermediates through photoredox catalysis to unveil new reactivity platforms. Makeda began her independent career at Columbia University in 2022.

Prof. M. Tekle-Smith

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INTERVIEW

SYNFORM *What is the focus of your current research activity?*

Prof. M. Tekle-Smith My research program is working to develop novel and practical strategies for controlling selectivity in chemical reactions. Specifically, we propose the design of new asymmetric reagents and the discovery of new mechanistic platforms using photoredox catalysis and non-covalent interactions. The goals of this program are to create enantiopure substances, harness the reactivity of unconventional chiral motifs, and grow the fundamental understanding of chiral structural effects. The interdisciplinary nature of my research program offers opportunities to innovate in drug discovery, materials chemistry, and data science applications (Figure 1).

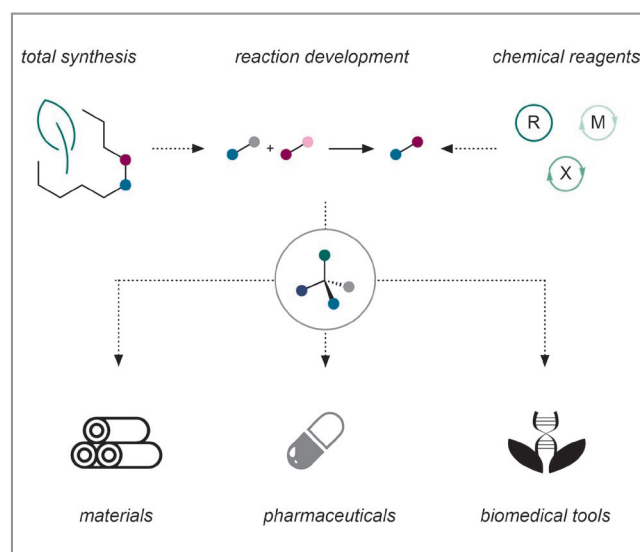


Figure 1 Research interests in the Tekle-Smith lab

SYNFORM *When did you get interested in synthesis?*

Prof. M. Tekle-Smith I've had an affinity for chemistry since high school, but I was drawn to synthesis in particular once I took organic chemistry in college. I had incredible professors, including Prof. Cynthia Selassie and Prof. Daniel O'Leary, who showed me how organic chemistry is the world around us. The idea that you could draw a structure on paper in the morning and go make it with your own hands in the afternoon blew me away. I don't think I will ever get over the feeling of successfully making something new in the lab. One of the things that always has and will continue to drive me is the goal of making new materials and technologies that make the world better.

SYNFORM *What do you think about the modern role and prospects of organic synthesis?*

Prof. M. Tekle-Smith One of the modern roles of organic chemistry I'm most excited about is generating new chemical matter that diverges from what we see commonly in nature. With synthetic methods rapidly advancing, we now have the ability to stretch our creativity in terms of what chemical structures we can access and new potential chemical motifs we can come up with. My hope is that, especially now with the types of data science tools at our disposal, organic chemists can accurately evaluate what chemical space we have currently explored and start targeting new structural architectures.

SYNFORM *What is your most important scientific achievement to date and why?*

Prof. M. Tekle-Smith My most important achievement to date is definitely the people I have mentored and I know that will be true in the future as well. Helping colleagues find their right career paths and creating inclusive environments where creativity and diversity can thrive and flourish will always be my top priorities and greatest achievements.

SYNFORM *If you had not become a chemist, what other profession do you think you would have entered?*

Prof. M. Tekle-Smith If I had not become a chemist, I would have liked to be an artist. I was in an art-based academy in high school, which interwove art and design into all classes. Before deciding to go to Pomona College to study chemistry, I was seriously considering attending art school. Now I consider myself more of a molecular artist with fine art (especially portraiture) as a hobby.

SYNFORM *Could you tell us something about yourself outside the lab, such as your hobbies or extra-work interests?*

Prof. M. Tekle-Smith Outside of the lab, I love being outside. Growing up in Santa Barbara, California, I love everything about the beach and try to get there as often as I can. I also have been playing soccer since before I can remember. I got a soccer ball for my 1-year-old birthday and have been playing ever since.

