

Hi Reddit! I'm Lily Raines, Manager of the Office of Science Outreach at the American Chemical Society. Ask me anything about ACS's special celebration for Earth Day this weekend!

AmerChemSocietyAMA ¹ and r/Science AMAs¹

¹Affiliation not available

April 17, 2023

Abstract

ACS AMA Hi Reddit! I'm Dr. Lily Raines, Manager of the Office of Science Outreach at the American Chemical Society. I completed my B.S. in Biochemistry with a Spanish minor at Eckerd College and my Ph.D. in Biochemistry, Cellular, and Molecular Biology at the Johns Hopkins University School of Medicine in the department of Biophysics and Biophysical Chemistry. I have been actively involved in science outreach throughout my scientific career, and my office manages both domestic and international outreach programs for ACS. I look forward to answering your questions about science outreach, including our upcoming Chemists Celebrate Earth Day event, which ACS has sponsored since 2003. This year, ACS's nationwide celebration of the positive impact chemistry has had on society and the environment coincides with the March for Science, which ACS supports. At the March for Science event in Washington, D.C., our volunteers will host hands-on educational activities for kids during a teach-in on the National Mall in partnership with the Earth Day Network. In addition to this weekend's activities, ACS also sponsors National Chemistry Week, which will celebrate its 30th anniversary this October, and Chemistry Festivals around the world. Ask me anything about these events, the importance of promoting public awareness and understanding of science, and ways you can have an impact in your communities. I'll be back at 11:00 a.m. EDT (8:00 a.m. PDT, 3:00 p.m. UTC) to answer your questions. Thanks for having me today, /r/science! If you have any other questions about our Earth Day event, other ACS Outreach programs, or how generally how to get involved in science outreach, please email me at outreach@acs.org. It's now 12:10PM and I'm signing off, have a great day!

[REDDIT](#)

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[ACS AMA](#)

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Raines, Manager of the Office
of Science Outreach at the

What do you believe most people are unaware about science that really would be beneficial to them?

[j938920](#)

That it really is quite experimental! So many famous discoveries were made by lucky accidents and strange phenomenon that the scientists involved took time to seriously think about. The most famous example of course being the discovery of penicillin, and a more recent example I think is CRISPR. Who could have imagined bacteria having something as complicated as an immune system? And how its discovery is now completely reshaping molecular biology? Science is full of amazing stories like those, and they speak to how important basic research is, in addition the more translational studies that most everyone can immediately see their value.

I think part of the frustration sometimes felt by the public - and young grad students! - is that from the outside, science seems to moves in a smooth progression with logical, methodical steps to a clear,

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unquestionable conclusion. The real life process is quite a bit messier, and it's incredibly important that scientists be able to take in new information and adjust their ideas. The fact that scientific consensus on many ideas seems to shift (for example, what foods are considered "healthy") is in fact a good thing, and not evidence that the scientists involved are inept.

As a current grade student who's considering leaving school after just receiving the masters, but who is interested in doing Science Outreach, how crucial would you say completing the PhD is for the field?

[SoChessGoes](#)

That is a tricky question! It's quite hard to say without being in your shoes, and being involved with Science Outreach can mean many different things. I find my PhD very helpful and I'm glad I did it, both for the technical knowledge I gained and the general analytical skills I learned, but I have plenty of colleagues who do great work without one.

You also don't have to be an outreach professional to make a huge impact. For example, many ACS Committees do great work in science outreach programs while their members are full time scientists.

If you do want to go "full-time," there are opportunities at science museums and similar places, as well as in science writing and public policy positions. The opportunities available vary quite a bit by region, so I would recommend talking to your university's career development office (if they have one) to get a better idea of what's available to you.

I'd also recommend taking advantage of, or making your own, volunteer opportunities to get a sense of what you really like to do. That was helpful for me as I was deciding what to do post PhD, and the volunteer experience was what put me over the edge when I applied for my position.

If you'd like to read more about my personal story, my friend interviewed me for her blog "Beyond the Postdoc." <https://beyondthepostdoc.wordpress.com/2016/12/01/a-world-of-opportunity/>

What kinds of activities are you doing during the March for Science? When doing hands-on demonstrations with kids, what kinds of safety precautions do you take?

[redstag73](#)

We are doing four activities based loosely around this year's Chemists Celebrate Earth Day theme, "Chemistry Helps Feed the World." The first is an experiment called Starch Search, described in detail online in our 2017 CCED Edition of Celebrating Chemistry. The second involves us using magnets to pull iron out of fortified breakfast cereals. The third uses beads that change color in response to UV light to explain how plants get energy from the sun, and the final experiment uses Magic Noodles, which are made of cornstarch and an excellent opportunity to talk different types of polymers.

You can see these experiments and more in our online archive of our CCED and NCW publications: <https://www.acs.org/content/acs/en/education/outreach/celebrating-chemistry-editions.html>

We are very safety focused! The major things we do are to ensure that the materials used are all generally safe household materials (nothing corrosive, toxic); no experiments are designed using flames or explosions; and we provide safety goggles for all children and demonstrators to use.

Our insistence on goggles is more about modeling good safety behavior than for handling these non-hazardous materials. We also focus on designing experiments using household items so that children and their families can re-do the experiments at home and share them with their friends. After all, Chemistry is more than just Breaking Bad!

What do you think of STEAM vs STEM?

[notrishno](#)

I think that scientists are, by nature, very curious and creative. You have to be creative in how you approach problems in these fields. I personally know many scientists and engineers with talents in art and music, and I love the beauty you can find in math (think the Golden Ratio https://en.wikipedia.org/wiki/Golden_ratio#Applications_and_observations and the Mandelbrot set images: https://en.wikipedia.org/wiki/Mandelbrot_set)

The arts are a natural partner discipline, and I think particularly important to include in early education. I firmly believe that STEM education is much more about teaching how to think than what to think, and arts are an important contributor to that.

I do think it is sad, though, that we have to come up with buzzwords and acronyms to emphasize the importance of these fields and thus to justify their continued coverage in education. History is also critically important, as are all areas of scholarship.

What's your position on the [absurd salaries](#) [see pages 7 and 8] given to ACS executives and the reliance on unpaid volunteer appointments for those managing the scientific directorships?

[Chocoltacol](#)

Unfortunately I'm not in a position to answer your question; please get in contact with Glenn Ruskin, our Director of External Affairs & Communications for information on your question.