

# 10 Reasons for You To Get Involved in Public Outreach

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Do you remember what sparked your interest in science? Was it the thrill of seeing an explosion in high school chemistry? Or dissecting an earthworm in preschool? Or an obsession with how epigenetics was affecting

you as you developed in the womb?

Though nearly every child is a natural scientist, born with curiosity and a desire to experiment, not everyone grows up to pursue that passion as a day job. We are part of that select group, but the critical thinking skills we learn as scientists-in-training could and should be used by everyone.

That is just one of a plethora of reasons why scientists should interact with the general public, both for our good and theirs. Here are ten more.

## 1. Improve your communication skills.

If you can explain your work to a 7th grader or a businessman, you can explain your work to a fellow neuroscientist. And that's important for your career. If you do amazing research but no one else understands it, how much impact will it actually have?

## 2. Reinvigorate your perception of your own work and its impact on the world.

We can easily get bogged down in the latest experimental failure and forget why we're doing all this in the first place. Explaining the big picture to someone can remind you why the project

you're working on is so awesome. In addition to potentially inspiring future funding, speaking to non-experts about your research allows for an enjoyable variety of questions that may be unpredictable. This provides a broader perspective of the field, possibly propelling your research in unexpected directions.

## 3. Spread your enthusiasm for your research and for science in general.

There really is a good reason why we do what we do. Once you've remembered that by explaining it to someone, spread that excitement! If you don't tell people what you do and why you do it, you can't expect them to intuitively appreciate the splendor of the synapse or the thrill of thalamic circuitry. Use your own passion to help lay people get both scientifically literate and passionate about research.

## 4. Be proactive about changing the way the public sees and understands science.

Rather than complaining about how the media oversimplifies things or how the public just doesn't understand, make an effort to help them understand. Yes, it can be tough to make a difficult concept clear without oversimplifying, but it's worth the effort. At the very least, it will allow the public to understand the scientific process and why it's so complicated and takes so long. It will help us as scientists if people have realistic expectations. Rather than thinking that a few years after they approve stem cell research, we'll have paraplegics running marathons, they will be able to understand why it's critical not to hold early stages of research back for too long.



Jennifer Shieh teaching about the brain on "Take Your Sons & Daughters to Work" day

particular can influence people to think more about financially supporting science, both indirectly through the government (do we want to fund missions to Afghanistan or Mars?) and through direct donations (adopt an orphan disease!).

#### 8. Scientific illiteracy in the public is dangerous.

Public support for the scientific enterprise is not only critical for us to keep our jobs, it is necessary for a reasonable and healthy society. Misinformation bombards everyone all the time – unfortunately, many people accept unreliable anecdotes over rigorous research. There is nothing inherently wrong with the coexistence of highly questionable claims and sound evidence; the problem is when people are unable or unwilling to separate the two. For example, despite the glaring lack of evidence for a link between vaccines and autism, the anti-vaccine campaigning of parents and celebrities like Jenny McCarthy is still leading to children not getting vaccinated. Critical thinking and familiarity with the experimental method allows people to interpret results, be flexible in the face of new discoveries, and reject arguments based solely on the "wisdom" of the crowds.

#### 9. We could use more scientific literacy in government.

Science and engineering training is great for tackling knotty problems – this can be true in government too. Unfortunately, it's actually a stigma for a politician to be branded intellectual these days. We could have ended up with a vice president who makes fun of *Drosophila* research, for pete's sake! We need to take action to ensure that the people creating the policies and laws that govern our actions understand what they're doing. Elected officials have the power to make both good and bad science policy. Help them make the right decisions.

#### 10. If not you, then who?



Suraj Pradhan showing animal brains to local high school students at Splash!

#### 5. Change the scientist stereotype.

There are two issues with the scientist stereotype that cause us to lose a lot of the public starting in middle school: 1) scientists don't look like them and 2) they don't want to look like scientists. When people think of scientists, they tend to think of a crazy-haired white male professor in a lab coat. We need to get out there and show them that scientists come in many different sizes, shapes, colors, and dispositions. We can't help our image by hiding in labs all day and night, so get out there and show off how cool you are (or revel in your nerdiness but at least show that you get to be yourself). Science is one of the rare professions that people choose because they like it, not just because of money or societal pressure – so present yourself as a rebel (with a cause). It would also do good for scientists to remember that we're extremely interesting people. After all, NIH believes it, NSF believes it, your graduate admissions committee believed it at some point. Now everyone else needs to be convinced of it as well.

#### 6. Break the cycle of poor science education in the US.

One big problem with the scientist stereotype is that kids lose interest in science and we may not be able to get them back. These kids who don't get a good grounding in science or develop an appreciation for it then grow into adults who don't care about science. Adults who don't care about science aren't likely elect officials who will direct the funding needed for a science education (or education in general for that matter). Without proper funding, kids won't be exposed to science directly, continuing the sad cycle of poor science education. We have the tools to break that cycle by telling those kids, adults, and the government why science education is so critical.

#### 7. Fulfill your obligation for receiving public funding.

Tax dollars fund much of our research, so we should present that publicly-funded work to our benefactors. They are the ones that put bread on our table and mice in our cages. We owe them an explanation for not having found that cure for cancer yet, and a reassurance that money spent in lab is not money wasted. Talking about scientific research in general and your work in



Sridharan Devarajan letting students handle brains for the first time at Splash!

There's a tendency to think that someone else will do this. But if we all put that responsibility on a mysterious "someone else" – there won't be anyone and we will end up blaming an imaginary foe that's really just us. Don't let that happen. Take charge and be part of the solution! If you're not part of the solution, you're part of the precipitate...

## 7+ Ways You Can Do It

It's really quite ridiculous how easy it is to get involved in "public outreach." From teaching a full classroom of kids to setting the record straight in a blog comment, from a lifetime of being a good scientific role model to giving a single inspired lecture, you choose the time and place and commitment. So, please do!

#### 1. Brain Day

As Stanford neurostudents, we're given a great opportunity to dazzle 7th graders by showing them real brains. This is about the time when a lot of kids start to lose their interest in science (or at least start thinking it's not cool to show an interest), so it's important to keep them enthusiastic. We do this for the Palo Alto community because they support Stanford and we are a part of that community. But this year, we're also spreading out to East Palo Alto, so now we can expand our excitement about the brain to a local community with fewer resources. Brain Day is our chance to show off what's cool about science: it's flashy, splashy, let's you experiment, play, check your ideas, make mistakes, ask all the "stupid" questions, and in the process discover how something works. And really, what's cooler than finding out how the brain works?

#### 2. Science Bus

If you'd prefer to face a raging leopard or a raging PI rather than teach 30 unruly 7th graders at a time, there are multiple other options right here at Stanford. For example, you can teach equally unruly 2nd through 5th graders through Science Bus. An after school program in East Palo Alto that meets twice a week, they also organize Science Olympics on Stanford's campus every spring and field trips to science museums in the Bay Area. You can come for a single session, teach a class every week, or staff the BBQ during the Olympics – any help is greatly appreciated by the kids and their teachers. This is also a chance to broaden

(or show off) your knowledge about scientific topics beyond the brain.

#### 3. Splash!

You can also target older kids (7-12th graders) through Splash! which allows you to design your own 1-4 hour course that focuses on anything at all, including (but not limited to) natural sciences. It's low commitment, medium preparation, and enormous fun. The participating kids are disciplined and interested – it's a rare opportunity to make an impact on the next nerd generation!

#### 4. Talk to your friends and family.

Maybe doing formal presentations isn't your thing. Or you just hate kids. Don't be afraid to try to explain what you do to your non-sciencey friends and family. They might not understand all of it, but at least you're showing your enthusiasm for it. And letting them know that they can come to you with questions you might be able to answer (like what it means when there's a study saying that this area or that area of the brain lights up when you do something) rather than the questions you probably can't (or don't want to) answer (like what you think about that rash). Show them how what you're studying is relevant to their lives. Maybe even invite them to participate in a project (a small one in your laboratory or a large-scale one such as SETI@home) – that'll make both sides feel proud and important.

#### 5. Talk to strangers.

It's ok to ignore your mom's advice about not talking to strangers now. Strike up conversation with people on the plane – or at least be open if they want to strike up conversation. You never know who you're sitting next to – this could be a great networking opportunity. If you're a ham, volunteer to give a talk at a science cafe, science pub, or an open mic night. Or don't give a talk; write a poem or a song or one-act play that incorporates some scientific theme. Yes, there exist critically acclaimed plays about science and scientists – check out "Copenhagen".

#### 6. Talk to politicians.

If you care about some issue, you were probably told that you should "write to your congressman" – but maybe only got form letters back. Well, it's still worth it. And now, the Obama administration has made a policy of openness and public participation. We are part of that public and right now they're soliciting opinions about what the government should do regarding public access to published federally-funded research results. This includes much of the research we are doing, so if you have ideas or opinions about what should/shouldn't be done, make yourself heard. Check out The Office of Science and Technology Policy blog for how to do this: [blog.ostp.gov](http://blog.ostp.gov)

#### 7. Talk to the world.

YouTube, Twitter, blogs, Wikipedia, the radio, podcasts – we have so many avenues available to us these days for communication. We've got the tools. Now go out there and use them!

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