CSSO COMMUNICATIONS
CHEMISTRY STUDENT SAFETY ORGANIZATION
The Official Newsletter of the Chemistry Student Safety Organization

Imposter Syndrome

by Juliette Strasser

Imposter syndrome is hard to describe, but chances are, most people have felt it at some point. Have you ever thought that everyone else in the conference room is smarter, better, and more perceptive than you? Perhaps you've convinced yourself that you don't deserve to be in in graduate school, and that your boss must feel that way too. You're not inadequate – it's just imposter syndrome speaking.

The initial paper on imposter syndrome was published in 1978 by Pauline Clance and Suzanne Imes, two psychologists who realized that their feelings of inadequacy were not isolated. At its core, imposter syndrome leads people to believe that "despite outstanding academic and professional accomplishments . . . they are really not bright and have fooled everyone who believes otherwise." Imposter syndrome is often so subconsciously ingrained that even "numerous achievements, which one might expect to provide ample object evidence of superior intellectual functioning, do not appear to affect the imposter belief."

Sound familiar? The Clance IP Scale contains a variety of statements that can help you to determine how big of a role imposter syndrome plays in your life. For example:

-I have often succeeded on a task or test even though I was afraid that I would not do well before I undertook the task.
-I avoid evaluations if possible and have a dread of other people evaluating me.
-I tend to remember the incidents in which I have not done my best more than those times I have done my best.
-Sometimes I'm afraid others will discover how much knowledge or ability I really lack.
-I feel bad and discouraged if I'm not "the best" or at least "very special" in situations that involve achievement.

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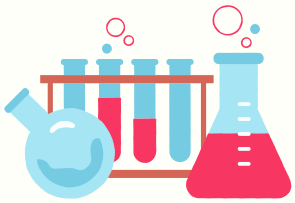
Editors-in-Chief: Mary King and Alli Smith

Common Safety Misconceptions

by Sky Price



We all have certain research habits that may not be as safe as they could be. Although you probably recognize some of them (and maybe even correct them whenever the safety inspector comes by!) there are a number of common misconceptions that affect all of us. Here are seven safety misconceptions and thoughts on avoiding them.

Skin exposure is less dangerous than inhalation or ingestion

While this is sometimes true, it's important not to overlook the dangers associated with skin exposure. Small rashes or chemical burns on your hands might not seem too concerning compared to taking a big whiff of a chemical, but the full symptoms and effects of repeated skin exposure could be years away. Just like regular sunburns cause skin cancer, frequent exposures to carcinogenic chemicals can cause big problems in the future.

"It's just dust"

Dust, whether it be from dry chemicals or silica, may not seem too harmful because it's so small. You may think that the amount you'll inhale will be negligible, but because dust is made of tiny particles, it can literally get in everywhere and will tend to stick in your airways. This can lead to serious long-term lung diseases. Similarly, for exposure to the eyes and skin, dust may only seem to cause some initial irritation, but could eventually cause more serious damage.

Every chemical that is a fire hazard should be kept in the flammables cabinet

The flammables cabinet is meant for flammable liquids only, not for oxidizing agents or incendiary solids. It's important not to store these compounds in the same space because flammable liquids are fuels, while oxidizing agents aid fires. Obviously, the consequences of this mistake could be disastrous!

I took all of the basic safety training courses during my first year, so I'm good to go for the rest of my degree

Be honest, how much of those basic safety training courses do you remember? Safety is something that should be continually practiced! You will only be prepared for an emergency situation if you regularly take precautions and think through what to do if something goes wrong. Before you start any new procedure, and especially something that you haven't done in a while, it's best to go back over the relevant hazards and how to take care of yourself first!.

You should always store "like with like": acids with acids and bases with bases

In some cases, this rule is true, but it is overly simple. For example, you should never store concentrated nitric acid with acetic acid – this will quickly combust. Likewise, you should never store solid sodium hydroxide near aqueous ammonia, as these two chemicals will react very exothermically to produce ammonia gas.

Inert Gases are Harmless

Nitrogen and argon may not be explosive, but they can be deadly. Any release in a confined space (i.e. for drying glassware or for air-powered tools) can create an asphyxiation trap – even 10% nitrogen in air is fatal. Unlike carbon dioxide, there is no signal of asphyxiation: whereas carbon dioxide will make you pant, nitrogen will cause unconsciousness without warning and can quickly lead to death. It was once calculated that nitrogen has killed more people than any other substance in the chemical industry! So be cognizant of this hazard, and make sure that any space where you're using nitrogen is well-ventilated.

I don't need to report minor injuries/near misses

If you work in a research laboratory, odds are you will experience a near miss at some point during your career. These occur because of little holes in your safety protocols, and even though they don't result in serious injury or damage, it is still important to report them. These incidents can help modify or strengthen existing safety procedures and reporting them forces you to actively reflect upon what went wrong and how it could have been prevented – all important aspects of making sure nothing worse ever happens. The CSSO website is a convenient place to anonymously report near misses! ;)

Safety Chair's Corner

by Prof. Mike Rose

Happy Summer! Even during these strange pandemic times, Summer is an exciting time to renew your energy for research, start new projects, and get those papers out and theses completed. I'm glad to start writing this 'Corner' for the CSSO Newsletter; I'm pleased to have the opportunity to support and expand the role of CSSO in our Department in improving our Safety Culture. So here's a few tips for summer research!

(1) Change of Guard: Summer is a dynamic time for lab personnel! It is with great joy we wish our graduating PhDs and undergrads well in their future pursuits, and existing lab members fill new roles in lab leadership and safety. Make sure there is clearly 1 or 2 students in your lab who are in charge of lab safety and EHS contacts, and there are clear lines of responsibility for lab safety and lab equipment. Encourage your safety officer (or anyone really!) to join or attend CSSO meetings!

(2) New Lab People: Your lab might have some new faces in lab: REU students, ACC students, Welch summer Scholars — be sure to properly familiarize them with your lab SOPs, equipment and particular safety hazards they may encounter. Because of the pandemic, some 1st year students are just getting rolling with their research. Make sure to make yourself open and available to them and that there are no "dumb questions" about lab operations and safety.

(3) Covid: Although the end is in sight, we're not out of the woods yet. Make sure to follow all UT guidelines for social distancing for a bit of summer fun. If your lab has specific guidelines inside the lab or student office (e.g. about eating / drinking in student office), continue to follow and discuss & update these guidelines is your lab sees fit. And, make sure to clearly convey the guidelines to the new folks!

(4) Summer Sun: Lastly…. Outside the lab: It's hot! Or at least — getting hot! We've had a nice run of mild weather (for Texas) this Spring, but the sun is almost at zenith and blazing down that UV A/B light upon us. If you're a potential walking sunburn like me (or even if you're not!), make sure to wear your biggest-ass hat and sunscreen up daily — or at least when headed out on the weekend for paddle-boarding on Town Lake, swimming at Barton Springs, or what-have-you.

Finally, have a great and safe summer!

-MJR

Dr. Rose Safety Fun Fact

Before I joined my eventual PhD lab at UC Santa Cruz, a grad student in my PhD group was running a column and left a hexanes 4L on the ground next to the fume hood. No surprise, it got kicked over. Then leaked under the refrigerator. The student then started to 'mop up' the hexanes with paper towels. Then the fridge condenser kicked on and sparked. A medium-size fire ensued. The lab workers were able to put out most of the fire with lab-mounted fire extinguishers, but not before it singed the fridge, the wall, and part of a work-bench. Luckily, no one was hurt.

Take-home message: **Don't ever put 4L bottles on the ground!** If solvents happen to spill — especially near a lab fridge or oven — use physical dams / barriers and vermiculate to soak up the liquid. Don't hesitate to call EHS if it goes beyond your comfort level to clean up.

Safety Day Re-cap

by Mary King

In May 2021, CSSO successfully hosted its very first virtual Safety Day, an initiative spearheaded by graduate student and CSSO member Carolina Hernandez. Thirteen research groups in the Chemistry Department submitted short videos on lab-specific topics covering everyday hazards and safety precautions, from cleaning up acid spills to handling biohazardous materials. After watching the videos, participants could then take a quiz on the content and vote for their favorite video. The event drew over 200 participants, with the video from the Page group on flame-drying glassware winning fan-favorite, while the Humphrey group won best video based on a rubric evaluated by a panel of safety judges. As an incentive to participate, a $100 Amazon voucher was offered to one person enrolled in the online Canvas course, which was won by undergraduate Juan Bonilla.

Thanks to all who participated and made this event a success! We are looking forward to establishing Safety Day as a CSSO tradition for years to come.

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If you see yourself in these statements, don't despair! Clance and Imes also offer some helpful tips for combatting your imposter syndrome, and you can try them right away.

For example, talking about imposter syndrome with a group of friends can help by providing a safe space to voice feelings of inadequacy. As with many other worries, talking about them makes them much less scary. Your friends provide a listening ear to vent and remind you that you're being a little bit ridiculous.

Another way to manage imposter syndrome is by reframing expectations – take qualifying exams as an example. It's easy to put hours of work into your proposal and presentation, thinking that if you don't do so, you're going to fail. However, instead of working to avoid failure, think about working to achieve success. If you expect success rather than failure, it's easier to take credit for your accomplishments.

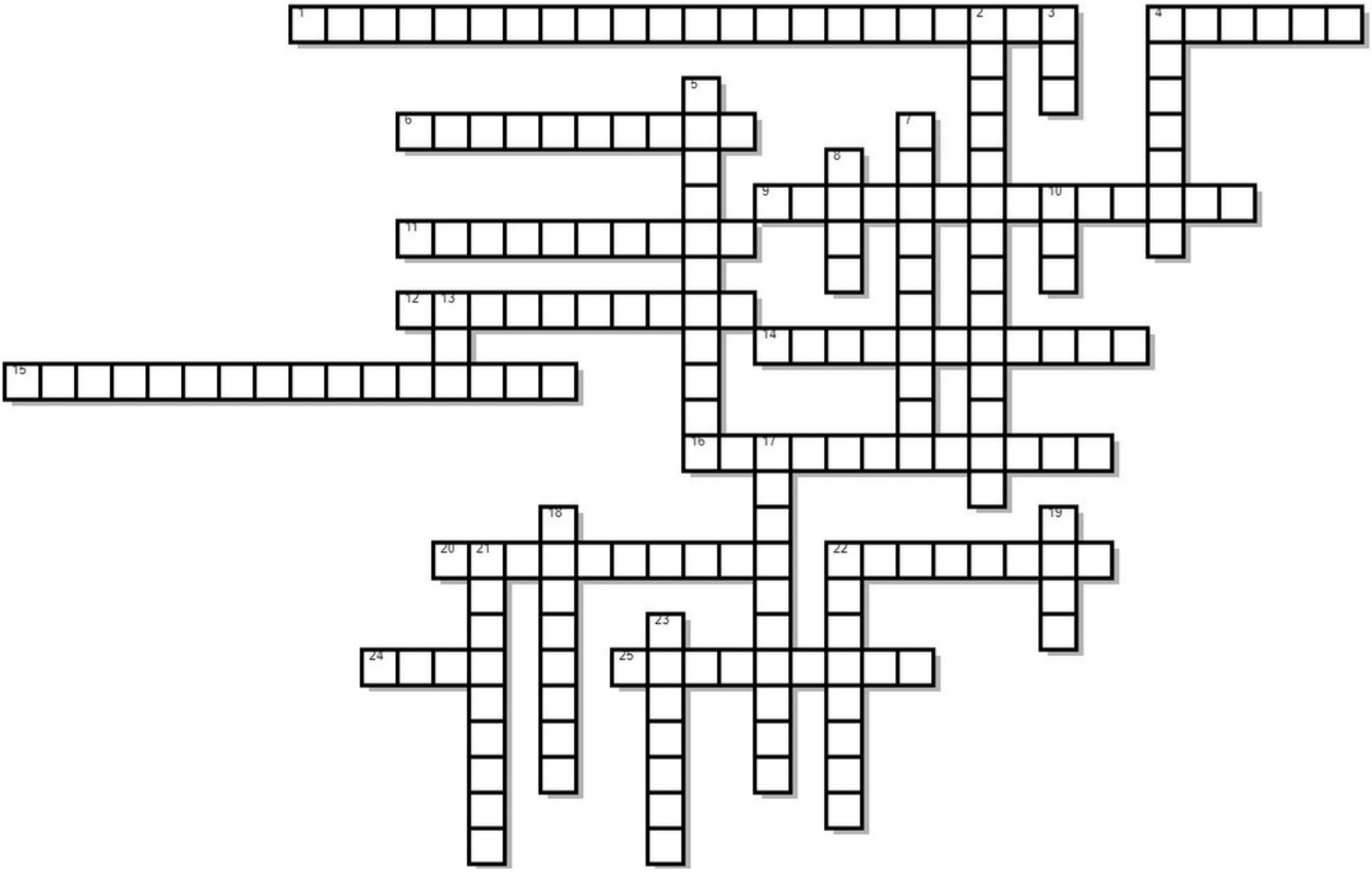
Finally, keep track of feedback that you receive, as well as your reaction. For example, if you always dismiss accolades, try sitting with the praise for a few minutes and noticing how that makes you feel. Similarly, if it's difficult to receive negative feedback without getting upset, look for the root cause of what's upsetting you. It can be just as difficult to accept praise for a job well done as it can be to take criticism without feeling like you've failed. Noticing these patterns can help you to change your reactions to them over time.

Interested in learning more about imposter syndrome? Clance and Ime's 1978 article is a great starting point, and here area a few other resources:

-If you'd like to see a discussion of how imposter syndrome affects graduate students, try this article from the American Psychology Association.
-If you're interested in a more detailed assessment of how to measure imposter syndrome, try this recent study from Frontiers in Psychology.
-If you want to listen to something while you're in lab, check out this TEDx Talk from Lou Solomon or this podcast from Kara Loewentheil.

Lab Safety Crossword Puzzle

by Calla McCulley



ACROSS

1 These should always be transported carefully and stored upright in a well ventilated and secured area away from heat, flames, and the sun
4 Wear these on your hands to protect you from taking your lab work home with you
6 A type of hazard in which a worker can or does make contact with energized equipment or a conductor
9 The process you use to identify hazards within your experimental protocols
11 These chemicals can ignite spontaneously in the presence of air
12 This can protect you from breathing in hazardous fumes in a laboratory setting
14 This can be used to extinguish a small fire by wrapping this item around the person; it works by cutting off the oxygen supply to the fire
15 Pull the pin, aim at the base, squeeze the trigger, and sweep with this lab safety equipment
16 This is where you go undress if your skin has been exposed to a hazardous chemical
20 These are materials that are highly reactive and can cause damage by chemically destroying living tissues
22 Many of us have worn these on our face during 2020-2021
24 You can react this chemical type with a base for neutralization
25 These describe a class of organisms which can cause diseases

DOWN

2 Use this to thoroughly rinse your eyes out after chemical exposure
3 These should be written down for every experiment you try during your time in the lab; they also should be checked annually for any changes/corrections
4 Wear these to protect your eyes from chemical hazards
5 These chemicals can cause cancer
7 A class of chemicals that can be easily set on fire
8 The student-led organization promoting safe lab culture practices within the Chemistry Department
10 The sheets you use to determine what hazards your chemicals might have
13 We use this acronym to define the safety regulators that help dispose of your generated lab waste
17 The temperature at which certain organic compounds give off sufficient vapor to ignite in the presence of air
18 A substance to produce very low temperatures
19 A large regulatory agency of the US Department of Labor who are responsible for enforcing its lab safety standards
21 This class of chemicals can never be stored next to flammable chemicals
22 You close the sash on one of these if running a synthesis overnight
23 The clothing item each researcher cannot be fully dressed without

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On Sunscreen

by Alli Smith

If you're like me, before you head to the pool this summer to beat the Texas heat, you'll pick up a bottle of sunscreen on the way. But which one should you use? SPF 30? 50? 100? And how much sunscreen is enough?
Sunscreen is one of your best forms of protection against the sun's harmful UVA and UVB rays. When picking out a sunscreen, you will want to know if it provides "broad spectrum" protection against both UVA and UVB rays, or not.

For protection against cancer-causing UVB rays, the FDA recommends that a sunscreen with at least an SPF (sun protection factor), of 15 is used. While sunscreens of increasing SPF are available at your local drugstore, a higher SPF does not necessarily mean greater protection. According to the American Cancer Society, there is only a 2% difference in UVB protection between SPF 30 and SPF 100 sunscreen-SPF 30 blocks up to 98% and SPF 100 up to 99% of UVB rays, respectively. A higher SPF sunscreen does not mean it lasts longer either. Whichever SPF sunscreen you use, you'll still need to reapply every two hours.

For sufficient protection, you'll want to use a shot glass worth of sunscreen to cover your entire body. Sufficient coverage is important because sunscreen is essentially a film of protective chemicals we apply to our skin, and if the film is too thin, then harmful rays can penetrate through to our skin. For example, as Sambandan and Ratner discuss in their overview of sunscreens in the Journal of the American Academy of Dermatology, a thick application of the active ingredients zinc oxide and titanium dioxide is required in order for these compounds to adequately reflect UVA and UVB rays off of the skin. These two chemicals are known as physical blockers because they reflect or scatter light, whereas other active ingredients in sunscreen such as octinoxate and cinoxate act as chemical absorbs of UVB rays, generating heat from the incoming light.

Sunscreen, like all other inventions, is not 100% effective. Just as we use multiple forms of protection in the lab, we too should use multiple forms of protection against the sun. So, when you leave behind your googles and your gloves for drinks by the pool, be sure to take a hat and a shot of sunscreen too!

For more information on the active ingredients in sunscreen, check out the following article:
Sambandan, D. R.; et al. Sunscreens: An Overview and Update. J. Am. Acad. Dermatol. 2011, 64 (4), 748–758. https://doi.org/10.1016/j.jaad.2010.01.005.

Answers to Crossword Puzzle