SAFETYMATTERS

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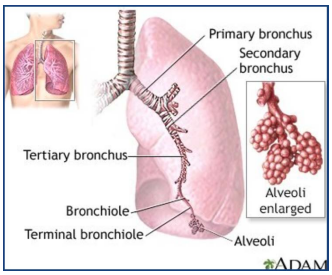
Health Hazards in the Clothing Production Sector: A Call for Reform

By Hadeline Hanonik, Safety Advisor

The clothing production sector, a critical area for global economies, is commonly linked with considerable health dangers for its employees. The exposure of workers to various contaminants and risks throughout the clothing production process can result in a variety of health issues. These include breathing problems, musculoskeletal injuries, and psychological health concerns. While on the surface clothing production and laboratory research may appear unrelated, workers in both industries can face similar risks and rely on similar controls to enhance the safety of their work environments.

A major health issue for clothing production workers is contact with cotton dust and endotoxins. Exposure to these substances can lead to a variety of breathing diseases. These include byssinosis, chronic obstructive pulmonary disease (COPD), asthma, and lung cancer. In addition to cotton dust, clothing workers face exposure to a variety of airborne contaminants. Some of these are particulate matter (PM), carbon dioxide (CO2), carbon monoxide (CO), and volatile organic compounds (VOCs). These contaminants may lead to irritation, inflammation, and long-term lung damage. Similarly, in laboratory environments, researchers may encounter hazardous substances via exposure to chemical vapor or biological agents. By implementing engineering controls in both settings, such as proper ventilation systems, air filtration and more, this can help minimize the exposure to harmful contaminates.



Inhaling the dust produced by raw cotton can cause byssinosis. It is most common among people who work in the textile industry.

The risk of musculoskeletal injuries (MSIs) is common in the clothing production sector. This is due to the redundancy of the job, working in uncomfortable positions, and the need to lift heavy objects. These injuries can lead to discomfort, reduced efficiency, and pain. Common MSIs experienced by those in this field include carpal tunnel syndrome, tendonitis, and back pain. The extended hours, low pay, and hazardous working conditions can also lead to significant mental health issues (Subramaniam et al., 2024). In laboratories, ergonomics is equally important. Specifically, it is important to ensure that laboratory workstations are properly designed, there is adjustable equipment available, and proper training techniques have been taught to workers to help reduce the risk of injury.

Pesticide and soil particles become trapped in cotton dust during the processing and spinning of cotton

Stress, anxiety, and depression are common among garment workers, which ultimately impacts their general health and work output. These workers may also be exposed to chemicals used in the dyeing, printing, and finishing stages of the process. These chemicals can lead to skin irritation, possible allergic reactions, and sometimes cancer. Furthermore, exposure to noise from machinery, without the proper personal protective equipment (PPE), can result in hearing loss. Inadequate ventilation in their place of work can also lead to respiratory conditions, as mentioned previously. In a laboratory setting, it is common for researchers to handle hazardous materials that require adherence to certain safety protocols. These can include PPE such as gloves and eye protection, laboratory coats and more.

The protection of all workers requires a comprehensive approach to occupational safety issues. In the garment industry this includes lowering workplace exposure to cotton dust, endotoxins, and other pollutants, while in the laboratory this may mean reducing contact with laboratory chemicals, biological agents and other hazardous materials. This can be done by introducing and utilizing appropriate engineering controls, providing PPE and maintaining clean work environments. It is also important to enforce occupational health and safety regulations, ensure workers have access to necessary training and education, and conduct regular health screenings to identify and address health issues early on. Improving the ergonomics of the workplace can help reduce physical strain on and prevent MSIs. Finally, offering counseling services and other support resources can also assist workers in managing stress and mental health challenges. By adopting some of these solutions, the clothing manufacturing sector, as well as the laboratory, can remain a safe place for all workers and researchers.

References: Subramaniam, S., Raju, N., Ganesan, A., Rajavel, N., Chenniappan, M., Stonier, A. A., Prakash, C., Pramanik, A., & Basak, A. K. (2024). Impact of cotton dust, endotoxin exposure, and other occupational health risk due to indoor pollutants on textile industry workers in low and middle- income countries. Journal of Air Pollution and Health. https://doi.org/10.18502/japh.v9i1.15080

Beyond EH&S is a feature welcoming guest authors from the Columbia community and beyond. These authors will share their expertise on safety and safety related matters.

Kaitlyn's Korner: Tales from a Seasoned Safety Officer

By Kaitlyn Dutton, PhD, Instrument and Facilities Administrator, Chemistry, Barnard College

Overview: This series will highlight safety incidents that have occurred in chemistry laboratories, while providing insight into what caused the incident and corrective actions to prevent future incidents. These stories are real anecdotes from academic laboratories in the United States and are intended to inform and remind researchers of potential hazards in the chemistry laboratory. This issue covers nitric acid compatibility and waste safety.

Incident: A graduate student was cleaning NMR tubes using concentrated (70%) nitric acid, to remove trace amounts of stubbornly stuck-on metal and/or organic residues from the glassware. After the NMR tubes had finished soaking in acid, the graduate student collected the spent acid into a small, hazardous waste container (in this case, a clean, empty glass bottle with a plastic lid), and affixed a hazardous waste label and filled in "nitric acid" and the appropriate hazard characteristics (i.e., corrosive, oxidizer, toxic). The graduate student then triple-rinsed the acid-washed NMR tubes with DI water to remove all traces of acid, and those rinses were transferred to the waste container. The graduate student updated the waste label to reflect the addition of water and adjusted the waste composition percentages to reflect ~20% nitric acid and ~80% water.

The graduate student then rinsed the NMR tubes a single time with acetone in order to remove trace water, which is a common procedure for glassware used for water-sensitive reactions. The graduate student then added the acetone rinse to the same waste container, sealed the waste bottle, and left it in a secondary container in the fume hood. The graduate student did not update the hazardous waste label to reflect the addition of acetone. The true composition of waste upon the addition of the acetone rinse was ~16% nitric acid, ~16% acetone, and ~68% water.

Approximately 30 minutes after the hazardous waste container was sealed, the container exploded inside of the fume hood from a buildup of pressure, breaking the plastic lid and launching a piece of it off of the bottle. Thankfully, no one was injured.

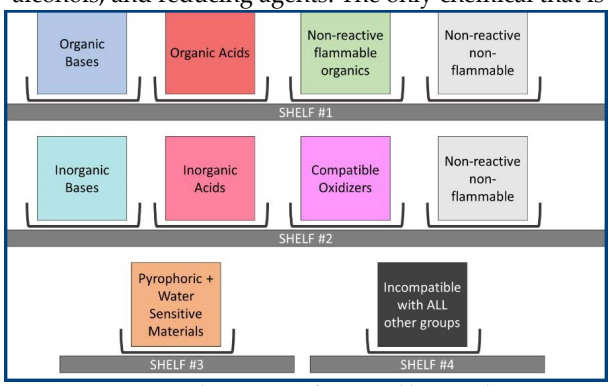
Contributing Factors:

Incompatible Chemicals in the Same Container: In addition to being a strong acid, nitric acid is also an oxidizer. Oxidizers are chemicals that support the combustion of other materials, or which otherwise react with or corrode reducing agents such as organic compounds or metals. Oxidizers must be kept away from incompatible materials at all times, and they cannot be combined in the same waste container. In this incident, the nitric acid waste stream was contaminated with acetone, an organic compound (CH_3COCH_3) that is not compatible with nitric acid. The organic acetone was oxidized by nitric acid to produce gaseous products (e.g., CO_2, CO) inside the waste container. The gas buildup inside the sealed waste container eventually generated enough pressure to explode by forcing a failure of the container's plastic lid.

Improper Waste Labeling: In this incident, the graduate student forgot to record the addition of acetone to the hazardous waste label that was affixed to the waste container. By not including acetone (nor its hazard characteristics) on the waste label, the graduate student missed an opportunity to identify the incompatibilities between acetone and nitric acid before combining them.

Preventative Measures:

Segregation of Nitric Acid: Proper storage and handling of chemicals is essential to preventing accidents and incidents in the lab, and proper safety training is crucial to understanding storage and handling guidelines. In particular, nitric acid has very strict guidelines surrounding its storage and disposal. As a best practice its usage in the lab should be defined in a specific SOP for individual applications. Nitric acid is one of the few chemicals that is not compatible with all other groups of chemicals, and it must be kept away from all incompatibles at all times (often via combination of secondary containment and physical separation). Nitric acid reacts violently and may cause fire when mixed with combustibles, plastics, organics, ammonia, cyanides, sulfides, carbides, perchlorates, permanganates, peroxides, metals, hydrides, other strong acids, strong bases, alcohols, and reducing agents. The only chemical that is safe to combine in stream with nitric acid is water, and researchers must still be aware of the physical hazard from the heat generated when adding a strong acid to water. It is suggested that researchers who have a need for nitric acid in the lab develop a specific SOP for its applications, and all potential users be trained in the hazards and safety controls for nitric acid prior to using it in the lab. An exclusive waste stream for aqueous nitric acid should be dedicated, labeled appropriately, and kept away from all other waste streams via secondary containment.



Suggested Segregation of Incompatible Materials

Improving Waste Label Etiquette: Recording the identity of all components in a hazardous waste container is a required safety and compliance practice, and it is better practice to record the identity of the chemical on the waste label before adding the chemical to the waste stream, rather than filling out the label after adding the chemical to the waste container. This practice provides the researcher with the opportunity to double-check the contents of the waste container before contributing a new, possibly incompatible, chemical to it.

EH&S Semi-Annual Full Staff Meeting

Twice a year the EH&S staff has an afternoon meeting featuring lunch, projects, accomplishments, team building activities, and laughs. At the October meeting, team members are invited to dress up for the season.

Presentations this year included a new Accident Reporting Platform for Columbia University, Oxygen Sensor Program Update, Cross Program Statistics Review, SEAS Walkthroughs, Research Operations Survey Program, Laboratory Safety Awareness Work Group Update, and T.R.I.C.K.S and T.R.E.A.T.S of a Fruitful Partnership by Chief Leigh Gholson, Dr. Matthias Quick, and Dr. Mark Underwood.

Pumpkin Decorating EH&S Style

Be Kind to Your Mind

By Carmen G. Hoepelman, Sr. Manager for EH&S Administration and Human Resources

When was the last time you took a moment to breathe, look around and take in the beautiful day? Or join a stress-free work activity, or just close your eyes for 5 minutes in your office and clear your mind of the chitter-chatter? If you responded to this question by saying to yourself, "it's been a long time", or "never", you in fact need to Be Kind to Your Mind.

At Environmental Health & Safety (EH&S), we are driven to work hard, but also play hard. Activities, events and opportunities such as pumpkin decorating, sand art, Kindness Campaigns, and filling in a huge coloring poster is important for a balanced Work/Life experience. Other opportunities for internal EH&S team building include an annual SummerFest, Ice Cream Social and HolidayFest. Each of these are a great time for breaking bread, sharing and caring.

During COVID-19, EH&S did not skip a beat with Team Building and celebrations - thank you Pam Shively, Associate Manager, Safety Training Programs! We got creative and held activities and celebrations virtually, nicknamed, "Separate But Together". We held Digital Escape Rooms, Trivia and Happy Hour, Brown Bag Conversation Lunches and Baby Showers. Keeping active with virtual activities, conversations and celebrations helped us to be kind to our minds, and kind to each other.

Our work obligations tend to have us tied into meetings several times a week, but meetings don't have to be held sitting in a room. Weather permitting and content permitting conduct your next meeting as a Walk and Talk with a colleague or a small group of meeting attendees. Consider hosting your next meeting or One-on-One outside. Skip the hot stuffy room or zoom!

The next time you consider taking a day off, do it to take time for you. Go for a walk, take in the outdoors, see a great film, or take the time to learn about something which you have been interested in. Your mind is kind to you with all that it holds for you to succeed, therefore Be Kind to Your Mind.

EH&S Accomplishments Beyond the Office

EH&S proudly supports the accomplishments our team makes outside the boundaries of Columbia University. One area that several of our team enjoys is competing in marathons and triathlons. Kathleen Crowley, VP of EH&S, has been competing in short- and long-distance triathlons for 10 years.

In October, KAC competed in the World Triathlon Championship Finals Torremolinos-Andalucia Spain 2024. Not only did she compete, KAC placed in the top 10 in both of her events, and top five for USA athletes in her age group!

- Age group Sprint – 7th World, 2nd American
- Age group Olympic – 8th World, 4th American

Congratulation KAC for representing the USA and your outstanding performances!

Cold Weather Safety Tips

When you are outside, frostbite and hypothermia are possible so you need to protect yourself.

1. Wear layers of loose-fitting, lightweight, warm clothing.
2. Wear a hat. Try to stay dry and out of the wind.
3. Cover your mouth to protect your lungs from extreme cold.
4. Mittens, snug at the wrist, are better than gloves.

https://www.weather.gov/media/aly/PSAs/ExtremeCold.pdf

Meet the EH&S Staff

Emily Riber

Office Coordinator

Emily Riber, Environmental Health and Safety Office Coordinator, is an integral member of the EH&S team. Having joined Columbia in April 2022, Emily has quickly established herself as a dedicated professional with a diverse background and a passion for continuous learning. Emily was born in Brooklyn, New York, and moved to Monroe, Connecticut, at an early age. Monroe is notable for its connection to Ed and Lorraine Warren, renowned paranormal investigators whose work inspired the Conjuring film series. The Warrens operated an Occult Museum in their home, featuring a collection of haunted artifacts, including the infamous Annabelle doll. Despite this intriguing history, Emily, who describes herself as easily scared, has never visited the museum, or watched any of the related films.

As the Office Coordinator, Emily plays a crucial role in ensuring the smooth operation of the Department. Currently, she is working on the 2025 Environmental Health and Safety (EH&S) "Uber Calendar", a project designed to centralize and organize departmental activities. This initiative reflects her commitment to enhancing communication and efficiency within the organization. Emily embraces the concept of lifelong continuing education; the best piece of advice she has received is to "always be curious and never stop learning."

Outside of her professional responsibilities, Emily enjoys a variety of hobbies, including reading, watching television, listening to music, and traveling. She especially loves the city of Paris, which she has long dreamed of living in, even before the popular Netflix series Emily in Paris. Emily's favorite sport teams are AFC Richmond and the Dillon Panthers. As Coach Taylor would say, "Clear Eyes, Full Hearts, Can't Lose."

Emily finds motivation in small rewards after accomplishing tasks, believing that celebrating achievements, no matter how minor, is essential for maintaining a positive outlook. To unwind after a busy day, she enjoys taking walks in the park, reading, or watching television, allowing herself to relax and recharge. In addition to her current projects, Emily aspires to become bilingual, expressing a desire to learn Italian.

Emily Riber exemplifies the qualities of dedication, curiosity, and a passion for community engagement at Columbia University. Her unique background, professional contributions, and personal interests make her a valued member of the university community. As she continues to grow in her role, Emily remains committed to fostering a collaborative and efficient work environment while pursuing her personal and professional aspirations.

Influenza Vaccine

COVID Vaccine

Holland Howard

Safety Advisor II

In the bustling halls of Columbia University, where academia meets innovation, one individual stands out not just for her ability but for her vibrant personality. Meet Holland Howard, EH&S Safety Advisor II, who brings a unique blend of humor, passion, and a touch of whimsy to the serious world of safety. Holland joined the Columbia community last July, bringing with her a wealth of experience and a fresh perspective. Hailing from Johnson City, Tennessee, Holland's hometown has a colorful history. During the 1920s, it earned the nickname "Little Chicago" due to its ties to bootlegging activities during Prohibition.

When asked which animal best represents her personality, Holland doesn't hesitate: "A killer whale." Why? Because like these majestic creatures, she is sociable, curious, and caring. However, there's a warning—confine them to a life of captivity, and they'll show their fierce side. It's a reminder that freedom and autonomy are essential, whether in the ocean or the workplace. As a true sports enthusiast, Holland proudly declares her allegiance to the Tennessee Volunteers and the Tennessee Titans. "I came out of the womb a Vol's fan," she says. Both teams may cause a bit of agony, but that's part of the thrill of being a dedicated fan. After all, what's the life of a sports fan without a little heartache?

Holland's favorite quote comes from the legendary singer Dolly Parton: "It's hard to be a diamond in a rhinestone world" This quote resonates with Holland, who embraces being her most genuine self. One of Holland's most endearing traits is her fearless approach to food. "I'm not afraid to eat things off the ground," she proudly proclaims, living by the five-second rule. It's a testament to her adventurous spirit and a reminder not to take life too seriously.

With a heart for the environment, Holland is motivated by the urgent need to combat the climate crisis. She believes that natural disasters serve as a wake-up call for everyone, regardless of their profession, to contribute to a more sustainable future. "Each of us has the potential to make meaningful improvements within our fields," Holland asserts, embodying the spirit of positive change. Currently, Holland is spearheading a laboratory sustainability initiative aimed at promoting energy-saving and waste-reducing practices. It's a project that reflects her commitment to making a difference and ensuring that Columbia University leads by example in sustainability.

When not busy ensuring safety at Columbia, Holland enjoys a plethora of activities. From comedy shows and concerts to museums and nature walks, she embraces life with open arms. "I really like everything that isn't work," she admits, though she also finds joy in her job most days. Despite her many interests, Holland has a curiosity that drives her to learn more about technology. "I wish I knew more about computer science," she confesses, humorously noting her lack of understanding of how her iPhone operates.

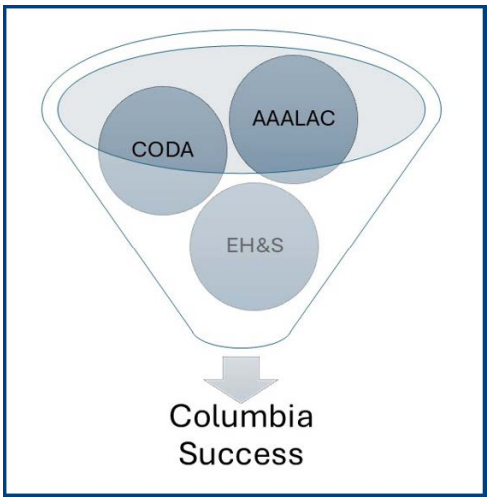
In a world where safety often takes a backseat to other priorities, Holland Howard is a breath of fresh air. With her unique blend of humor, passion for the environment, and dedication to work, she reminds us all that safety can be both serious and fun. So, the next time you see Holland in the halls of Columbia, remember, behind the title of Safety Advisor II is a person who embodies the spirit of curiosity, laughter, and a commitment to making the world a better place.

How EH&S Supports Columbia University in Achieving CODA and AAALAC Accreditations

By Samira Joussef Pina, Biosafety Officer

Environmental Health and Safety (EH&S) plays a vital role in helping Columbia University secure essential accreditations from the Commission on Dental Accreditation (CODA) and the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC). These accreditations are crucial for maintaining the university's reputation, securing funding, and attracting students and faculty. EH&S departments are at the forefront, at Columbia and elsewhere, ensuring compliance with the rigorous safety and ethical standards required for these distinctions.

CODA, established in 1975 and recognized by the U.S. Department of Education, accredits dental programs that meet specific educational and operational standards, overseeing over 1,400 dental and related programs in the U.S. and abroad. The CODA process involves a thorough self-study, on-site reviews, and continuous quality improvement. AAALAC meanwhile, focuses on the humane treatment of animals used in research, teaching, and testing, accrediting over 1,100 institutions worldwide through a comprehensive peer-review process that ensures adherence to high standards of animal welfare.



EH&S is essential to both accreditation processes. For CODA, it ensures dental programs follow best practices in infection control, hazardous material management, and radiation safety. EH&S oversight provides that facilities, from dental clinics to laboratories, are safe and compliant with regulatory requirements, helping institutions pass inspections and maintain accreditation. This oversight is critical for ensuring that the university meets the high standards set by CODA.

For AAALAC accreditation, ICM (Institute of Comparative Medicine) is responsible for ensuring proper animal care and effective facility management, while IACUC oversees protocol compliance, ethical considerations, and regulatory adherence for research involving animals making the accreditation a true collaborative success. EH&S ensures the animal worker safety by conducting risk assessments, managing occupational health risks, and maintaining high safety and hygiene standards. They implement measures such as personal protective equipment (PPE) for allergen control, specialized ventilation systems to reduce airborne contaminants, and auditory safeguards in high-decibel environments, actively mitigating health risks associated with animal care. This involvement supports accreditation and reassures the global research community of the institution's commitment to high-quality animal care.

The value of these accreditations extends beyond compliance. CODA accreditation is often required for state funding and is necessary for graduates to qualify for licensure exams. Similarly, AAALAC accreditation elevates a university's standing in the global research community by demonstrating a commitment to ethical animal research, attracting top-tier researchers and funding from organizations that prioritize ethical standards.

Maintaining accreditation requires continuous oversight, and EH&S collaboration with all stakeholders is pivotal in this effort. In the context of AAALAC accreditation, EH&S provides regular training, conducts safety audits, updates protocols to maintain compliance with evolving standards while fostering a culture of continuous improvement and safety.

The role of EH&S in securing CODA and AAALAC accreditation is vital to Columbia's success, affirming the institution's commitment to high-quality education, patient care, and ethical research. These accreditations enhance the university's reputation and its ability to attract students, faculty, and funding. By consistently ensuring that safety and ethical standards are met, EH&S positions Columbia University for Long-term Success in both academic and research endeavors.

Hazardous Waste Shipping

Did you know that shippers of dry ice and certain biological materials MUST be trained before packaging, labeling or preparing and signing shipping documents? Training for shippers of these materials is available via Rascal as course #TC0076 and TC0507. The training must be renewed every 2 years; note, shippers of chemicals and other hazardous materials MUST contact EH&S for assistance.

Georgian Fire Drill

EH&S participated in the fire drill led by Matthew O'Hanlon, Director of Fire Safety, Facilities Management on October 10, 2024. Pictured is Chara Proud, Health and Safety Specialist putting out the simulated fire. The drill included all offices in the Georgian Building on the first three floors.

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NRC Commissioners Visit to Columbia and NewYork-Presbyterian

By Peter Caracappa, Chief Radiation Safety Officer

Columbia University and NewYork-Presbyterian Hospital (NYP) recently hosted a visit by two members of the US Nuclear Regulatory Commission (NRC): Chair of the Commission Christopher Hanson and Commissioner Bradley Crowell. The NRC is a five-member body appointed by the President of the United States that is charged with regulating the safe use of nuclear power and other uses of radioactive materials, including in medicine. While a great deal of time and attention is understandably devoted to the oversight of the country's inventory of nuclear power reactors, the commissioners were interested in getting a closer look at other applications of nuclear technology and radioactive material to expand their understanding as they carry out their duties.

Dr. Andrew Einstein, the Director of Nuclear Cardiology at Columbia, serves as a member of the NRC's Advisory Committee on the Medical Use of Isotopes and organized the visit from the commissioners. During their time on campus the visitors witnessed a nuclear cardiology stress test, a Lu-177 radiopharmaceutical therapy procedure, a Y-90 microsphere procedure, observed the equipment used for high dose rate brachytherapy, visited the Gammaknife facility, discussed the experiments taking place at the Center for Radiological Research, visited the cyclotron radiochemistry laboratory and saw new equipment being installed in the Kreitchman PET Center.

Radiation Safety is proud to have played a part in hosting the NRC team and highlighting the amazing work that takes place at Columbia and NYP, including our commitment to safety of the patients, staff, and the public. The commissioners expressed their gratitude for the visit and were positively impressed by what they saw.

Pictured in front of the hot cells in the Cyclotron Radiochemistry Lab -- From Left to Right: Dr. Akiva Mintz (Chief of Nuclear Medicine and Director of the PET Center), Dr. Peter Caracappa (Chief Radiation Safety Officer), Lisa Dimmick (NRC staff), David Brown (NRC Staff), Commissioner Bradley Crowell, Chairman Christopher Hanson, Moly Marsh (NRC Chief of Staff), Dr. Andrew Einstein (Director of Nuclear Cardiology).

Lithium-ion Battery Safety Tips

- Aging batteries degrade, become swollen and can represent an explosion hazard. Continuous charging of the battery may accelerate aging.
  Tip - Follow the manufacturer's directions on charging and dispose of swollen batteries in an EH&S battery disposal bin.
- Batteries that do not meet established manufacturing standards may overheat and catch fire.
  Tip - Only purchase UL-listed products that contain lithium-ion batteries.
- Batteries charged in poorly ventilated spaces may overheat and catch fire.
  Tip - Charge in ventilated spaces, away from combustible material, and do not keep charging the battery after it is fully charged.

The battery on the right is swollen.

EH&S New Team Member

Katie Fritz - Associate Biosafety Officer

EH&S Fun Facts

EH&S loves our pets! The staff currently has 10 dogs, 12 cats, one hermit crab and an apiary of bees. Although some team members don't have their own pets, they fur baby sit.

Editorial Staff: Kathleen Crowley, Marianne McCartney, Chris Pitoscia, Pam Shively
Please share questions or comments with us at **newsfeedback@columbia.edu**