SAFETYMATTERS

Volume 20 Issue 4 | COLUMBIA UNIVERSITY EH&S | Fall 2026

Inside this Issue

Environmental Health & Safety

Website
http://ehs.columbia.edu

Irving Medical Center
Phone: (212) 305-6780

Morningside and Manhattanville
(212)-854-8749

Radiation Safety
Phone: (212) 305-0303

Instagram

@columbiaehs

Before You Begin: Building Safety Into New Research Procedures

By Holland Howard, Associate Manager, Research Safety Operations Program

Research is constantly evolving, and laboratories regularly introduce new chemicals, materials, equipment, and experimental techniques. While these advances are essential for scientific discovery, new or unfamiliar procedures may also introduce hazards that researchers have not previously encountered. Taking the time to evaluate these hazards and develop a thoughtful safety plan before beginning work can help prevent incidents and ensure research is conducted safely.

Developing a Comprehensive Protocol

A protocol should provide enough detail to ensure that the procedure can be performed safely and consistently. This includes information such as the materials being used, their quantities and concentrations, equipment requirements, expected duration of the procedure, and any special handling considerations. Including detailed information about the process improves reproducibility while also allowing safety concerns to be identified and addressed before work begins.

Researchers should review available hazard information when developing the protocol, including Safety Data Sheets (SDS) for all applicable chemicals and materials. Additional resources, such as published papers, manufacturer guidance, or established protocols from other institutions, can be employed to identify potential hazards and determine appropriate safety measures.

Identifying Controls and Safety Requirements

Good protocols outline the safety measures required to perform the work. This includes applicable training requirements, engineering controls, administrative controls, personal protective equipment (PPE), emergency procedures, and waste management practices.

Controls

- Engineering controls, such as fume hoods and biosafety cabinets, are the primary means of reducing exposure risks whenever applicable.
- Administrative controls, including written procedures, signage, storage and handling, and special considerations like not working alone can further reduce risk by establishing clear expectations for how work should be performed.
- PPE requirements such as glove selection, protective clothing, eye protection, and any additional PPE requirements based on the materials and procedures being used.

Preparing for Emergencies

Planning for unexpected situations is a critical part of developing a safe protocol. Procedures should include information on how to respond to potential incidents, including spills, exposures, equipment failures, or other emergencies. Researchers must know what actions to take, what resources are available, and who should be contacted if an issue occurs.

Waste Management

Waste management should also be considered before work begins. The protocol should address how waste will be collected, labeled, stored, and disposed of to ensure compliance with applicable safety and regulatory requirements and University policies. Thorough planning helps prevent improper waste handling and reduces the potential for exposure or environmental impacts.

Training and Communication Before Starting Work

Before performing a new or unfamiliar procedure, researchers should receive appropriate training specific to the work being conducted. Hands-on, job-specific training is strongly recommended to ensure personnel understand the procedure, associated hazards, required controls, and emergency response expectations.

All personnel involved in the work should review the protocol and applicable SDS(s) before beginning the procedure. The final protocol should remain readily available for reference while the work is being performed.

When to Contact EH&S

If researchers are developing a new protocol, working with an unfamiliar hazard, or have questions about appropriate safety measures, they should contact EH&S before beginning work. To help EH&S provide the most effective guidance, researchers should provide:

- A draft protocol or description of the planned work
- Applicable SDSs
- Papers, publications, or other references used to develop the procedure
- An anticipated timeline for when work is expected to begin

EH&S will review the information and schedule a time to meet in the laboratory to better understand the procedure, equipment, and work environment before providing recommendations.

The goal of EH&S is to partner with researchers to address safety and regulatory requirements while supporting innovative research. Early communication allows potential hazards to be identified proactively and helps ensure that safety considerations are addressed without unnecessary delays or interruptions to research activities. By planning ahead and involving EH&S early, researchers can create safer, more efficient processes that support continued scientific advancement.

Biohub and EH&S Partnership

By: The SafetyMatters Editorial Team

Biohub is a nonprofit research organization building the first large-scale initiative to combine frontier AI and frontier biology to solve disease. By leveraging its computing capacity, AI research and engineering, and state-of-the-art technology for measuring, imaging, and programming biology, Biohub is enabling scientists worldwide to use AI-powered biology to study how cells operate and organize as systems – ultimately understanding why disease happens and how to cure or prevent it.

Biohub's program in New York City is led by Professor Andrea Califano of Columbia University, and brings together experts from Columbia University, the Rockefeller University, and Yale University to focus on early disease prevention, detection, and treatment. Columbia University is one of many university partners around the country. Biohub was established at Columbia in 2024 in temporary space in the William Black Building at CUIMC while a state-of-the-art laboratory and bioinformatics facility was constructed on the top floor of the Studebaker Building. This 6-story building, constructed in 1923, is a former auto storage and finishing plant acquired by Columbia University and preserved as part of the Manhattanville campus expansion.

EH&S partnered with the Biohub design and construction teams to develop laboratory research spaces that conform to relevant standards and Institutional requirements.

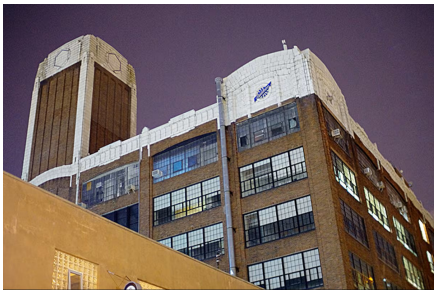
According to Christopher Pitoscia, Director, Environmental Health & Safety "It is critical that laboratory facilities be planned and built to safely support the research that is intended to take place within. The collaboratively authored Columbia University Laboratory Design Guidelines provide an important baseline for all projects at Columbia, including Biohub's. Ensuring laboratory projects meet these standards allows for EH&S to provide continual observation and feedback of compliance and safety conditions within the space."

EH&S participated in design and construction meetings to advise the team on all relevant safety concerns, including the type and location of emergency equipment, laboratory engineering controls including chemical fume hoods, biological safety cabinets, and other local exhaust ventilation, as well as chemical handling, storage limits and permitting, as prescribed by FDNY (Fire Department of New York). EH&S then performed pre-occupancy walkthroughs and Biohub scientists occupied the facility in June 2026. An expansion of research programs is underway.

In a similar manner to services provided to organizations like Barnard College and the NYS Psychiatric Institute, Columbia EH&S will continue to provide laboratory research safety support to Biohub including chemical inventory tracking, ensuring compliant chemical storage and waste management as well as regulated medical waste disposal. Occupational safety services such as hazard-specific assessments and exposure monitoring, and emergency response services for all laboratory hazards will also be provided.

Each Biohub Group Leader, equivalent to a University Principal Investigator, will maintain a profile in the University's Laboratory Information Online Network (LION), all safety surveys will be documented. EH&S will assist Group Leaders in developing a Laboratory Assessment Tool and Chemical Hygiene (LATCH) Plan. Since Biohub personnel adhere to Columbia University policies, as well as all federal, state, and local regulations, they will have access to the full suite of safety training already available to the University community as well as FDNY Certificate of Fitness C-14 resources. Biohub will also have access to institutional review by the Institutional Biosafety Committee (IBC) and Institutional Biological Research Activities Committee (IBRAC).

"Moving into Studebaker is a milestone we've been working toward for a long time. Columbia's EH&S team has been a great partner from day one, helping us design spaces that meet the demands of the science we're doing here," said Meghan Hughes, Vice President of Operations, Biohub.

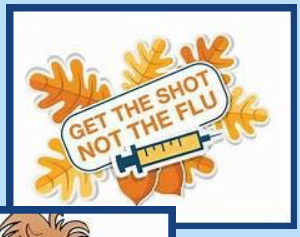


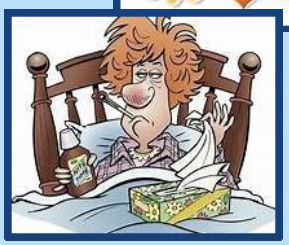
We are pleased that Biohub was able to draw on the breadth of subject matter expertise in EH&S. Columbia offers Biohub a warm welcome to their new home at Studebaker and wishes them success with their research programs.

SAFETYMATTERS
Volume 20 Issue 4
COLUMBIA UNIVERSITY EH&S
Fall 2026

New IBC and IBRAC Chair

Congratulations to Dr. J.J. Miranda, Associate Professor of Biological Sciences at Barnard College, who has been appointed to Chair the Institutional Biosafety Committee (IBC) and Institutional Biological Research Activities Committee (IBRAC). Dr. Miranda replaces Dr. Stephen Morse, Professor of Epidemiology at CUIMC, who chaired the IBC for twenty years and announced his retirement in June. EH&S welcomes Dr. Miranda to his new role and is indebted to Dr. Morse for his extraordinary service and leadership.





Don't Forget Your Influenza Vaccine

No-cost/free for eligible students, faculty, and staff with a valid CUID.

Medical Center Campus will be administering vaccines from September 1, 2026-November 9, 2026.

Morningside flu shot schedule and Flu Fair dates are typically announced by Columbia Health in late August or September. On-campus walk-in flu clinics generally take place at the Lerner Hall Auditorium starting in late September or October.

Set your clocks back one hour on November 1, 2026!

"Fit Happens; How to Ensure the Best N95 Respirator Seal"

By Christopher Pitoscia, Director, EH&S

The COVID-19 pandemic created a working familiarity with respiratory protection that most people likely would have otherwise never been "exposed" to. The differences between N95s, surgical face masks, tight-fitting elastomeric respirators, and powered air-purifying respirators (PAPRs) are now far more common knowledge than just several years ago. Nonetheless, reminders are always helpful when it comes to proper use of PPE—especially respirators—because improper use can result in a dangerous lack of protection and even personal injury.

Surgical Mask

N95 Respirator

Elastomeric Respirator

Powered Air-Purifying Respirator

First and foremost, respirators are not "just better masks." In occupational settings, their use is driven by a required hazard/risk assessment and is subject to regulatory standards and institutional policy. In nearly all research environments, respiratory hazards can be limited or controlled through engineering controls (e.g., fume hoods, local exhaust) and administrative controls (e.g., procedures, training), so respirators may have a narrow, specific role, if any at all. In the hierarchy of controls, the old adage that PPE is the last line of defense holds true. Respirators should only be used when needed, selected for the hazard, and managed correctly—not treated as a general-purpose solution.

Every task should first be evaluated to determine the type and level of airborne hazard, the duration of exposure, and whether substitution or improved ventilation can eliminate or reduce the risk. These factors determine whether respiratory protection is necessary and, if so, which respirator is appropriate. Using the wrong respirator—or using the right one incorrectly—can create a false sense of security.

Every task should first be evaluated to determine the type and level of airborne hazard, the duration of exposure, and whether substitution or improved ventilation can eliminate or reduce the risk. These factors determine whether respiratory protection is necessary and, if so, which respirator is appropriate. Using the wrong respirator—or using the right one incorrectly—can create a false sense of security.

When respirator use is required, employees must be enrolled in the University's respiratory protection program. This includes medical clearance, required training, and fit testing for tight-fitting respirators. These steps are essential because respirators increase breathing resistance, can place physiologic stress on the wearer, and only provide protection when they fit properly and are worn correctly. OSHA rules dictate that annual fit testing is performed. However, a change in facial structure resulting from significant weight loss or gain , or other factors such as surgery or dental work may warrant another fit test.

It is important to remember that fit testing applies only to the specific make, model, and size of respirator tested. Changing brands, models, or sizes—even if they appear similar—can compromise fit and reduce protection. If a different respirator is needed for another task or work location, a new fit test is required before use.

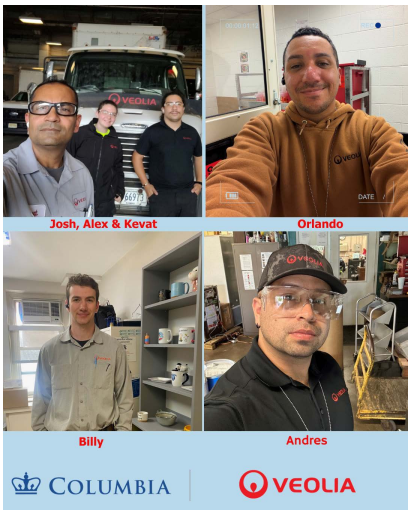
Proper donning, doffing, and routine inspection are equally important. Tight-fitting respirators should receive a user seal check every time they are put on, and work should not begin unless an adequate seal is achieved. Facial hair along the sealing surface, improperly positioned straps, ill-fitting eyewear, jewelry, or an incorrect respirator size are among the most common reasons for fit failure.

Finally, respirators should be stored in a clean, dry location away from sources of damage or contamination, sunlight, and temperature extremes. Rubber straps are usually the first component to fail. Always review expiration dates on the packaging, follow manufacturer's instructions and institutional guidance for cleaning, maintenance, and cartridge or filter replacement. If you have questions about respirator selection, fit, or program requirements, contact occusafety@columbia before beginning work.

Meet the EH&S Staff

Veolia On-Site Waste Management Services

The Hazardous Materials Program at Columbia University manages chemical, universal , and radioactive waste operations in partnership with Veolia Environnement S.A, the University's approved vendor. Veolia provides on-site collection, packaging, transportation, and disposal services for chemical waste generated across Columbia University's campuses and affiliated facilities, including Barnard College and the New York State Psychiatric Institute (NYSPI).



Veolia personnel are on campus four days each week to support routine waste collection activities. On Mondays and Thursdays, Kevat Patel serves as the on-site technician at CUIMC. On Tuesdays and every other Friday, William ("Billy") Clark provides support for the Morningside campus and the Jerome L. Greene Science Center (JLG). Veolia technicians verify that waste containers are properly labeled, closed, and in good condition, collect them from laboratories, inand transport them to the appropriate Central Accumulation Area (CAA). Investigators should ensure that their chemical waste meets the requirements for collection.

The Veolia team responsible for waste shipment operations across the campuses includes Josh, Orlando, Alex, and Andres. The team prepares chemical waste for transportation, generates manifests, and ensures compliance with applicable city and state regulations.

The partnership with Veolia is an important part of Columbia's waste management operations. Their team brings a knowledgeable, proactive, and solution-oriented approach to their work, with a strong willingness to help the Columbia research community. Their positive "can-do" attitude and expertise help make the day-to-day management of laboratory waste more efficient and compliant.

Non-Urgent Service Requests

Need help with a non-urgent service? Below are the most common requests for services. Please note, chemical waste pick up has a regular schedule for pick up at the Medical Center, Jerome L. Greene and Morningside campuses but you must submit a pick up form.

CHEMICAL WASTE PICK UP (Medical Center, Jerome L. Greene and Morningside)	
Form required:	https://research.columbia.edu/hazardous-materials-and-sustainability
Service at MC: Mondays & Thursdays	
Service at MS: Tuesdays & Fridays	
Service at JLG: Wednesday	
REGULATED MEDICAL WASTE (RMW) PICK UP (sharps, red bags, red bins)	
MEDICAL CENTER:	**For all RMW services and supplies at the Medical Center, please contact Facilities Operations at 212-305-7367 ext. 3**
MORNINGSIDE:	
Laboratories in Pupin, CEPRS, and Schermerhorn	Please place an online chemical pickup request for RMW services and supplies
Laboratories in Chandler & Havemeyer	RMW will be picked up during your routine service on Tuesdays and Fridays.
Laboratories in Fairchild, Mudd, Engineering Terrace, NWC	RMW only serviced directly on Fridays. Laboratories must place the RMW container in the hallway the night before the service.
JEROME L. GREENE SCIENCE CENTER:	RMW will be picked up during your routine service every other Friday.
LAB CLEARENCE REQUEST FORM	
Form required	https://research.columbia.edu/system/files/EHS/Forms/ClearanceRequestForm.pdf
LAB DOOR SIGN	
Laboratory door signage by campus	https://research.columbia.edu/environmental-health-safety-documents
LAB VACATING PROCEDURE	
Form required	https://research.columbia.edu/sites/default/files/content/EHS/Forms/VacatingProcedures.pdf
FRIDGES AND FREEZERS REQUISITION REQUEST FORM	
Form required	https://research.columbia.edu/system/files/EHS/Lab%20Safety/Refrigerator.pdf

ATTENTION SHOP USERS!

Environmental, Health & Safety is looking to connect with shop and studio users across campus. If you use a shop or maker space - including woodworking, metalworking, machining, welding, 3D printing, electronics, spray painting, or other fabrication spaces - we would like to hear from you!

By identifying yourself as a shop user, you can help us better understand your operations and safety needs. We are here to provide safety resources, training, guidance, and support to help you work safely and confidently.

Let us know you are a shop user - we are here to help! Safety is a shared responsibility, and we want to partner with you to keep our campus shops safe.

WE'RE HERE TO HELP!

- Safety consultations and assessments
- Training and best practices
- Resources to help you work safely and efficiently

SAFETYMATTERS
COLUMBIA UNIVERSITY EH&S
Volume 20 Issue 4
Fall 2026

Pyrophoric Chemical Safety: Prevention, Preparedness, and Response

By Cindy Ma, Safety Advisor II

Are You Prepared for a Pyrophoric Emergency?
Pyrophoric chemicals are among the most hazardous materials used in research laboratories. These substances can ignite spontaneously upon contact with air, creating the potential for fires, serious injuries, and significant laboratory damage if not handled properly.

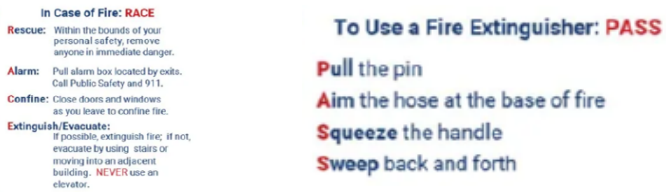
One of the most well-known laboratory accidents involving a pyrophoric chemical occurred in 2008 at the University of California, Los Angeles (UCLA). A researcher was transferring tert-butyllithium (t-BuLi), a highly pyrophoric reagent, using a plastic syringe. The plunger came out of the syringe during the transfer, exposing the t-BuLi to air and causing it to ignite immediately. The researcher, who had limited experience handling pyrophoric materials and was not wearing a lab coat, sustained severe burn injuries and later died.

The tragedy became a turning point for laboratory safety in academic research, highlighting the importance of hazard-specific training, appropriate personal protective equipment (PPE), written standard operating procedures (SOPs), and emergency preparedness when working with highly hazardous chemicals.

Start with Prevention
Emergency preparedness begins before an incident occurs. Researchers should understand the hazards of the pyrophoric materials they use, review relevant Safety Data Sheets (SDSs), and follow SOPs. Researchers should receive training specific to the chemicals and processes used in their laboratory and should be familiar with the location and use of emergency equipment.

Before beginning work, ask yourself:

- Do I understand the hazards associated with this material?
- Have I reviewed the SOP?
- Do I know what to do if a spill or fire occurs?
- Is the necessary emergency equipment readily available?



Be Prepared for Small Spills
Even with careful planning, spills can occur. Laboratories that use pyrophoric materials should have a response plan that is appropriate for the quantities and hazards present.

For small pyrophoric spills, dry sand may be used to carefully cover and isolate the material. Researchers should avoid disturbing the spill, remove nearby flammable/combustible materials when safe to do so, and cordon off the affected area.

After the spill has been stabilized, contact Columbia Public Safety and Environmental Health & Safety (EH&S) for further guidance.

For larger spills, evacuate the area, close the door, and contact Public Safety immediately.

Prepare for Fires and Exposures
Laboratory personnel should know the location of emergency equipment before beginning work with pyrophoric materials. Depending on the materials used, this may include fire extinguishers, fire blankets, eyewash stations, emergency showers, and spill response supplies.

In case of fire, follow the RACE principles (Rescue, Alarm, Confine, Extinguish) and use PASS (Pull, Aim, Squeeze, Sweep) when operating a fire extinguisher. If a person's clothing catches fire immediately, use Stop-Drop-and-Roll, an ABC fire extinguisher, or a fire blanket to extinguish flames and seek medical attention.

Dry sand may be used to smother small pyrophoric fires. If a fire extinguisher has been used, cover any remaining residue with dry sand to help prevent reignition. Never use water to extinguish a pyrophoric fire, as it can react violently with many pyrophoric materials and worsen the incident.

Know When to Evacuate
Not every incident can be safely managed by laboratory personnel. If a pyrophoric material ignites out of control, a spill is larger than anticipated, or there is any uncertainty regarding safe response actions, evacuate the area immediately and activate emergency response procedures.

Researchers should not place themselves at risk attempting to save equipment, experiments, or materials. Personal safety must always remain the top priority.

A Shared Responsibility
Effective emergency response depends on preparation, training, and communication. Principal investigators, laboratory managers, and researchers all play an important role in ensuring that emergency procedures are understood before an incident occurs.

Columbia EH&S encourages laboratories working with pyrophoric materials to periodically review emergency procedures, verify that emergency equipment is available and accessible, and discuss response expectations during laboratory meetings and training activities. All laboratory workers are required to complete Laboratory Safety, Chemical Hygiene, and Hazardous Waste Management Training prior to working in a laboratory. Personnel working with pyrophoric reagents must also complete specific pyrophoric materials training prior to beginning work.

Emergencies are unpredictable, but preparation does not have to be. Taking time to plan ahead can help protect personnel, research activities, and the broader Columbia research community.

Radiation Skin Erythema

By Dennis Farrell, Health Physicist

The clinical radiation safety team has responsibilities for managing radiation exposure for patients and health care professionals. Monitoring erythema happens in the clinic where using Venn diagrams, skin erythema can be documented, monitored, and predicted.

Radiation skin erythema is a visible reddening of the skin caused by ionizing radiation commonly occurring after high dose fluoroscopy employing x-rays or radiation therapy employing x-rays or gamma rays, especially in patients with fair skin who lack melanin-generated skin pigmentation. It should be noted that the difference between gamma rays and x-rays is their point of origin.

They interact with human tissue and destroy cancer cells in the exact same way. Gamma rays originate from inside an unstable atomic nucleus during radioactive decay, whereas x-rays originate from electron interactions outside the nucleus, typically produced artificially by accelerating elections into a metal target.

Managing skin erythema requires understanding the complex interactions between patient anatomy and radiation exposure. Traditional text descriptions often fail to show how these different factors intersect. An old tool, the Venn diagram, is a visual aid to clarify these overlapping causes over time.

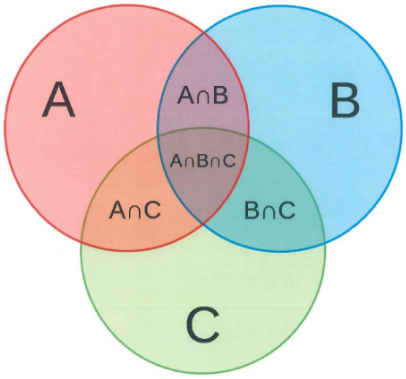
Structure:
A three set Venn diagram effectively organizes the primary variables of radiation induced skin injury.

Set A: Radiation Parameters: Total absorbed dose in gray (Gy), and beam energy.

Set B: Patient and Biological Factors: Genetic pre-disposition, pre-existing skin conditions, and body mass index.

Set C: Temporal and Environmental: Time elapsed post-exposure and current administration of radio sensitizing drugs.

Analyzing the Intersections:
The power of the Venn diagram is in the overlapping regions which represent complex physical realities.



Intersection of A & B: Dose & Patient Sensitivity: The patients who develop early or severe erythema at lower than average doses due to underlying genetic condition.

Intersection of A & C: Dose & Time: Defines predictable onset of transient erythema within hours of receiving a high acute threshold dose above 2 Gy.

Intersection of B & C: Biological factors: genetics, pre-existing skin conditions & time elapsed, exposure and use of radio sensitizing drugs.

Intersection A, B and C: Total Picture: Dose & dose rate, energy and biological factors of BMI, genetics, pre-existing skin conditions, and time elapsed.

Using Venn diagrams improves clinical decision making by making risk assessments faster and clearer. Physicians and dermatologists use visual models to explain risk factors to patients and staff. The model does, however, have limitations because it simplifies continuous biological variables into rigid geometric shapes, ignoring non-linear dose responses. Older equipment exposed the skin to a higher dose of radiation because almost 100% of the beam dose was deposited near the skin surface. New skin-sparing equipment deposit dose more deeply into tissue and reduce the incidence of erythema.

Conclusion:
Venn Diagrams offer a practical, visual way to break down overlapping causes of radiation skin erythema. By mapping radiation dose, patient health and timing together, medical teams can better predict, diagnose, and treat skin injuries.

EH&S New Staff

Alex Olivares - Safety Advisor

EH&S Promotions

Cindy Ma - Safety Advisor II
Emily Riber - Senior Office Operations Coordinator
Katie Fritz - Biosafety Officer
Marianne McCartney - Senior Research Safety Program Coordinator
Samira Joussef Pina - Associate Manager of Biological Programs/ Senior Biological Safety Officer

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