

# LABORATORY & RADIATION SAFETY

Cornell University Department of Environmental Health & Safety

125 Humphreys Service Building, Ithaca, NY (Tel. 255-8200)

201 Palm Road, Ithaca, NY (Tel. 255-8200) <http://www.ehs.cornell.edu>

# NEWS

Winter 1999

## ULTRACENTRIFUGE EXPLOSION DAMAGES LABORATORY



### Description of the Accident

A campus laboratory was seriously damaged when the rotor of an ultracentrifuge failed while in use. Flying metal fragments damaged walls, the ceiling, and other equipment. The shock wave blew out the laboratory's windows and shook down shelves.

On December 16, 1998, milk samples were running in a Beckman L2-65B ultracentrifuge using a large aluminum rotor (a rotor is a large metal object that holds the individual sample tubes and is connected to the spin drive of the centrifuge). The rotor had been used for this procedure many times before. Approximately one hour into the operation, the rotor failed due to excessive mechanical stress caused by the "G" forces of the high rotation speed. The subsequent explosion completely destroyed the centrifuge. The safety shielding in the unit did not contain all the metal fragments. The half-inch thick sliding steel door on top of the unit buckled, allowing fragments, including the steel rotor top, to escape. Fragments ruined a nearby refrigerator and an ultra-cold freezer, and made holes in the walls and ceiling. The unit itself was propelled sideways, damaging cabinets and shelves that contained over one hundred containers of chemicals. Fortunately, sliding cabinet doors prevented the containers from falling to the floor and breaking. A shock wave from the accident shattered all four windows in the room. The shock wave also destroyed the control system for an incubator and shook an interior wall causing shelving on the wall to collapse. Fortunately the room was not occupied at the time so there were no personal injuries.

The cause of the accident is believed to be the use of a model of rotor that was not approved by Beckman for use in a model L2-65B ultracentrifuge.

### Preventing Centrifuge Accidents

Rotors on high-speed centrifuge and ultracentrifuge units are subject to powerful mechanical stress that can result in rotor failure. In addition, improper loading and balancing of rotors can cause the rotors to break loose while spinning. Everyone using this type of equipment needs to know the proper operating procedures for the specific unit being operated, including how to select, load, balance, and clean the rotor. These procedures are explained in the unit's operating manual. It is also necessary to "derate" some rotors (limiting the maximum speed at which the rotor is used to some level below the maximum speed listed for the rotor when new) based on the amount of use the rotor has received. This requires that operators maintain a comprehensive use log for each rotor. These procedures are also explained in the operating manual.

Laboratory supervisors must ensure that all operators of this type of equipment are properly trained in the selection, care, and use of rotors. If a trained and experienced operator is not available to train new operators, contact the service representative for the unit and arrange an orientation program. If you are unable to reach the manufacturer, please contact EH&S.

In the event of operating problems with high-speed centrifuge or ultracentrifuge units, or signs of wear or damage to rotors, the equipment should be taken out of service immediately and clearly marked "Warning -- DO NOT USE" until checked by an authorized service representative.

### Special Hazard Warning for Older Equipment

Older equipment does not have all the safety features that are built into new units. They are more likely to experience rotor failures and they are more likely to cause injuries when they fail. It is critical that all safety and maintenance procedures specified by the manufacturer are followed. Based on the investigation of the December accident, EH&S learned that Beckman L2 and L3 series ultracentrifuges have special operating procedures and restrictions to reduce the risk of damage and injuries. This includes an orange decal on the sliding door that specifies the rotor models that are safe to use in a particular unit.

EH&S would like to provide specific safety information to owners of Beckman L2 or L3 ultracentrifuges at Cornell. If you have an operable unit of this type, please contact us, or fill out the form on the web page listed below so that we will be able to contact you. If you have this type of unit and prefer to take it permanently out of service, please disconnect the unit from the electric outlet, and then cut the power cord from the unit.

**Please look at our web page at [www.ehs.cornell.edu](http://www.ehs.cornell.edu) for more information, additional pictures, and the form to request specific safety information.**



## RADIATION SAFETY TRAINING

Individuals must receive radiation safety training **prior** to starting work with radioactive materials. This training is required by law. The course is given in two separate presentations; both sessions must be attended. There is a short exam, which can be taken either at the end of the second day, or later at our office during normal business hours. Please bring your university ID number. *Prior registration for this course is necessary, as seating is assigned on a first come first served basis.*

**To register for this course, please call the EH&S main desk, at 5-8200.**

Following is the training schedule:

February 1 & 3	1:00 - 4:00 p.m.
February 16 & 18	9:00 a.m. - 12:00 noon
March 12 & 15	1:00 - 4:00 p.m.

## ADVANCED RECORD KEEPER TRAINING

This training is held monthly, on the last Friday of every month. It is geared just for those who perform and record the monthly lab meter/wipe test surveys and for those who do monthly reports to reconcile the individual stock vial inventory sheets. The survey class, taught by Chris Bell, is from 1:00 to 2:00 p.m., and the inventory class, taught by Marlene Larson, is from 2:15 to 3:15 p.m.

**Call Agnes Morris at 55600 for the class schedule or to register.** See the tentative schedule below:

Register by:	Class Date:
January 22	January 29
February 19	February 26
March 19	March 26

## REMINDER! RADIATION SAFETY FORMS ON-LINE

It is now possible to request a radioactive waste pick up and/or request badge additions/deletions from our EH&S Web page. Visit us at [www.ehs.cornell.edu](http://www.ehs.cornell.edu), select "Online Forms", and choose either "Film Badge Request Form" or "Radioactive Waste Pickup Form". Then follow the instructions to fill out the form. It is very important to be sure that ALL the information requested is included.

## CHEMICAL SAFETY TRAINING

The next new employee laboratory worker OSHA Laboratory Standard training programs, "Chemical Safety for Laboratory Workers", will be held in the training room at 118 Humphreys Service Building on:

Wednesday, February 3, from 9:00 a.m. - 12:00 noon  
Wednesday, March 3, from 9:00 a.m. - 12:00 noon

Please contact Veronica Parsons-Zieba by e-mail at [vpj4@cornell.edu](mailto:vpj4@cornell.edu) or by phone at 254-4693 to register.



## Radiation Safety Eagle Awards



We are pleased to recognize the following laboratories for receiving radiation safety awards:

### September

E. Alani, Genetics & Development, Biotech. Bldg.  
C. Aquadro, Genetics & Development, Biotech. Bldg.  
\* M. Hanson, Genetics & Development, Biotech. Bldg.  
K. Kempfues, Genetics & Development, Biotech. Bldg.  
R. MacIntyre, Genetics & Development, Biotech. Bldg.  
M. Kyle-Jahn, Plant Breeding, Bradfield Hall  
J. Steffens, Plant Breeding, Bradfield Hall  
S. Tanksley, Plant Breeding, Emerson Hall  
G. Hrazdina, Food Science & Technology, Geneva  
A. Bensadoun, Nutritional Sciences, Kinzelberg Hall

### October

\* T. Fox, Genetics & Development, Biotech. Bldg.  
M. Wolfner, Genetics & Development, Biotech. Bldg.  
Y. Boisclair, Animal Science, Morrison Hall  
X. Lei, Animal Science, Morrison Hall  
J. Parks, Animal Science, Morrison Hall  
M. Milgroom, Plant Pathology, Plant Science Building

### November

W. Brown, Biochem., Molec. & Cell Biol., Biotech. Bldg.  
J. Calvo, Biochem., Molec. & Cell Biol., Biotech. Bldg.  
D. Shalloway, Biochem., Molec. & Cell Biol., Biotech. Bldg.  
V. Vogt, Biochem., Molec. & Cell Biol., Biotech. Bldg.

\* T. Delaney, Plant Pathology, Plant Science Building  
D. Bauman, Animal Science, Morrison Hall  
W.R. Butler, Animal Science, Morrison Hall  
R. Avery, Vet. Microbiology & Immunology, VMC  
J. Casey, Vet. Microbiology & Immunology, VMC  
J. Helmann, Microbiology, Wing Hall  
J. Shapleigh, Microbiology, Wing Hall

### December

D. Antczak, Vet. Equine Medicine, Baker Institute  
\* C. Parrish, Baker Institute of Animal Health  
J. Ray, Baker Institute of Animal Health  
K. Ray, Baker Institute of Animal Health  
R. Dieckmann, Materials Science and Engr., Bard Hall  
D. Gonsalves, Plant Pathology, Geneva  
W. Koeller, Plant Pathology, Geneva  
W. Roelofs, Insect Biochemistry/Entomology, Geneva  
D. Soderlund, Entomology, Geneva

\* Winners of Party Packs from Pudgies Pizza