

## STANDARD OPERATING PROCEDURE

### Analytical X-Ray Machine

**Principal Investigator: Weiyi Peng**  
**UH X-Ray Subregistration:**

**Applicable X-ray Machines:**

MANUFACTURER	MODEL	S/N
Rad Source	RS 2000	3467

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**Start-Up Procedures:**

1. Reserve procedure time on the online calendar at least 24 hours before your starting.
2. Check out Physical Key from Dr. Jiakai Hou (phone 832-946-8402; SERC Bldg 545/3005A)
3. Sign up with the X-Ray irradiator sign book before use.
4. Place your sample into the chamber in the platform or animal cage chamber.
5. Close the front door and turn the handle clockwise until fully engaged.
6. Turn the Power On-Off/Reset Key fully to the right and hold in the Reset position until the green light turns on.
7. When the Touch Panel Control Screen is on, login by the lab username and password.
8. Select System – by pressing the “System” button.
9. When you are the first user of the day, or the screen indication appear “ warm up is needed” perform an X-Ray tube warm-up by press the “warm-up” button.
10. Press the Start button and confirm starting by pressing the “Yes” button in the prompt that pops up (then the light will flash to indicate the X-ray is on).
11. When the warm-up is finished, the buzzer will sound and show complete. Then press “Home” to start operation.
12. Select the “Automatic” or “Manual” operation mode by touching the screen.
13. Automatic mode
  - ❖ Under the “Automatic” mode, you can select 1. Automatic Program 2. Timed Exposure 3. Dose Exposure mode
  - ❖ At automatic program, select the desired program from the drop-down menu. Verify that the parameters shown on the right side of the display are correct. Press “Start” and confirm start by pressing the “Yes” button at the prompt.

- ❖ At timed exposure mode, in Automatic, press “Refresh”. Input the desired time (min & sec), shelf position, and, current (mA). The corresponding dose (Gy) will be displayed in the parameters window. Press “Start” and confirm start by pressing the “Yes” button at the prompt.
- ❖ At dose exposure mode, in Automatic, press “Refresh”. Input the desired dose (Gy), shelf position, and, current (mA). The corresponding time will be displayed in the parameters window. Press “Start” and confirm start by pressing the “Yes” button at the prompt.
- ❖ After pressing “Yes” button please keep 2 or more feet away from the irradiator while waiting for the exposure to complete, when the buzzer will sound.

#### 14. Manual mode

- ❖ Press “Home” then press “Manual”, on the right, change the kV, mA, shelf position, filter, and time to the desired. (No calibrated dosage information will be available when using this mode) Press “Start” and confirm “start” by pressing the “Yes” button at the prompt.
- ❖ After pressing “Yes” button please keep 2 or more feet away from the irradiator to waiting for the exposure complete, the buzzer will sound.

#### **Shut-Down Procedures:**

1. Take out samples and close the front door.
2. On the left, press Log off button.
3. Insert USB storage device, press “Save”.
4. Remove USB storage device when prompted and press “Log off”.
5. Turn the Power On-Off/Reset Key fully to the left position until the green light turns off.
6. Fill the sign book with exposure time and finish time.
7. Close the door and return the key to the administrator.

#### **Emergency Procedures:**

1. Stop working immediately by pushing the emergency stop switch.
2. Properly shut down x-ray machine.
3. Notify Lab Supervisor or PI.
4. Seek medical care, if needed.
5. Notify Radiation Safety at 713-743-5858.

#### **Primary Operator (Designated User or PI):**

NAME: Jiakai Hou  
Emergency Phone: 832-946-8402  
Office (Bldg/Room#): SERC Bldg 545/3005A

Responsible for:

Keeping Safety Devices Functioning  
Maintaining Power and Bypass Keys  
Conducting or Overseeing Alignments, Calibrations, and Repairs

**General Safety Requirements:**

- X-ray equipment must only be used by Authorized Users in authorized locations.
- Authorized Users must have current UH X-Ray and Laboratory Safety training.
- The RSO must be informed of any changes with equipment, location, or personnel.
- All active analytical x-ray machines must have written Standard Operating Procedures (SOPs), and the procedures must be pre-approved by the RSC.
- Standard Operating Procedures shall be stand-alone documents that are attached to, posted near or available close by every active analytical x-ray machine.
- Interlocks and other safety devices should be checked each time the x-ray equipment is used.
- A log of x-ray machine use shall be maintained near the unit.