The Genomics Core Facility
Orientation and Site Specific Safety Training
What we will cover

• Genomics Core Facility (GCF) Orientation
  • GCF Introduction
  • Services
  • GCF Location & Instrumentation
• Permission to Use
• Access to GCF
• Vendor Programs
• Site Specific Lab Safety
GCF Introduction

- [http://gcf.uta.edu/](http://gcf.uta.edu/)
- Kim Bowles, LS B34, 817-272-9636
- Anya Williford, LS B15, 817-272-3200
- Melissa Muenzler, B24, 817-272-0090

- Hours of operation 9am – 5pm
- After hours access by key card only
GCF Services

- Sanger Sequencing
- Next Generation Sequencing – Illumina MiSeq
- Flow Cytometry Training
- Confocal Microscopy Training
- Instrument Usage Assistance
  - Autoclaves, Bioanalyzer, Nanodrop, qPCR, Tissuelyser, Hydroshear, etc.
- Ultrapure Water (no charge)
- Dark Room Facility
- Special Access Instruments: Qubit
  - GCF staff runs samples
GCF Room Locations

The GCF is physically divided into multiple labs and instrumentation is strategically placed in the various labs based on the assays to be performed and required workspace. Placement of the instrumentation takes into account proximity to other instruments and space requirements for computers and other operational hardware.

- Primary GCF Facility: LS B24 (Including B20, B24BA, B22), B09
- Imaging Specific Facilities: LS B21 and LS B20B
- Satellite Facilities:
  - LS 212
  - ERB 480
- Darkrooms: LS B22A & ERB 484B
- Autoclaves: LS 239EB, ERB 480
- Genomics Facility: LS 603, ERB 478C
Primary Facilities B24

The primary component of the GCF consists of multiple suites surrounding B24 in the Life Sciences building. Within B24, you can find the operations office and store as well as shared instrumentation and work space. While this workspace is shared amongst users, it is also used by the GCF personnel for its offered sequencing services.

Included in this space are:
• 2 PCR hoods
• 2 Veriti thermal cyclers
• 2 Eppendorf 5810R centrifuges with rotors for microcentrifuge tubes, 15 ml and 50 ml conicals,
• Sorvall ultracentrifuge
• AB 7300 qPCR instrumentation
• Gel dock
• Agilent Bioanalyzer
• Nano drop
Sanger DNA sequencing and genotyping can be performed on the ABI 3130 XL to which there are 2 levels of service:

• 1: Samples are submitted ready to be loaded onto the 3130 for $0.50/rxn
• 2: Drop off samples premixed with primer and the GCF will sequence the sample and email your results for $5/rxn or $4/rxn for more than 48 samples
• Please see http://gcf.uta.edu/3130xl.html for Sequencing Requirements and Sequencing Request form
Imaging Facility

Training on use of the BD LSRII flow cytometer and Zeiss LSM10 Confocal can be arranged through the GCF (muenzler@uta.edu) and is required before use.

LSRII Multicolor Flow Cytometer

LSM510 Confocal Microscope
Satellite Facilities

- LS 212 – Incubators, Shakers, ICE!
- ERB 480 – Gel Dock, Washer, Nano drop, Autoclaves
- Darkrooms
  - LS B22A: Key access only (see GCF to checkout key)
  - ERB 484: Card access only
  - Film Developer Mini Med MM90
- Genomics Facility LS 603 / ERB 478C
  - Primarily used by GCF staff only
  - LS B22: Ultrapure water location; contact GCF for access
Permission to Use

- The core facility is a shared use facility and must be treated as such.
- There are guidelines for using the equipment and these must be followed.
- Many of the machines use paper sign-in logs; these must be used.
- Specialized equipment requires calendar sign-up; please request access by emailing Melissa: 
  muenzler@uta.edu
Requirements for Instrument Use

- Complete Hazard Communication and Waste Management (Academic) through UTA: https://uta-ehs.org/
- Complete GCF Site Specific Training to get LAB access.
  - Specify which labs.
- Complete INSTRUMENT training for EACH instrument by GCF staff (or your lab instructor).
- For BSL2 work please contact EH&S and alert GCF; if approved, there are special UTA trainings.
  - Most of GCF is NOT BSL2.
- For confocal microscopy, complete both UTA laser safety test AND be trained by Melissa Muenzler.
Requirements for Autoclave Use

- Complete UTA Safety Training
  - “On-Site Biohazardous Waste Management: Autoclaving” located at [https://uta-ehs.org/](https://uta-ehs.org/)
  - PPT also on GCF website for your reference

- Complete instrument –specific training.
  - Either by the GCF or by Dr. Jackson, or her designee.

- Log every use, indicate which autoclave is used
  - Waste runs go on the EH&S log sheet and require the waste SOP
  - Every other run gets logged on the GCF log sheet.

*Autoclaves can be dangerous. Do not try to repair them yourselves, contact GCF, your GTA or Dr. Jackson*
For Core Facility Access

- Please complete all appropriate training
  - GCF Site Specific
  - UTA HazComm
  - Laser Safety (if applicable)
  - BSL2 (if applicable)
  - Autoclave training (if applicable)

- Access requests are usually sent by a PI to Paulette (pbatten@uta.edu) or Melissa (muenzler@uta.edu). We need your full name, email address and 1000#.
Local stock of some items, free shipping on other items!

Helix Cabinet & Freezer: Taq, ladders, PCR components, enzymes, pGEM®-3Zf(+/−) vectors, plasmid minipreps, gel & PCR clean up kits are available for purchase in LS B24 & ERB 480. You can find a complete list of products listed on the freezer and cabinets. At this time we do not provide primers.
UTA Supply Centers: Life Technologies LS B05

Local stock of some items, free overnight shipping on other items for Tues or Thurs arrival! $6 transaction fee per purchase (not per item fee)

Life Tech Fridge, Freezer & -80: Cell culture & transfection reagents, competent cells, Qubit reagents, TaqMan genotyping master mix, Hi-Di, distilled water and other lab related chemicals and enzymes. Please contact the GCF to make purchases or open an optional account.
**UTA Supply Centers: Light Labs Consumables**

**LS B24 & ERB 480**

<table>
<thead>
<tr>
<th>Items</th>
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</thead>
<tbody>
<tr>
<td>• Tips</td>
</tr>
<tr>
<td>• Kim Wipes</td>
</tr>
<tr>
<td>• PCR tubes and plates</td>
</tr>
<tr>
<td>• Gloves</td>
</tr>
<tr>
<td>• 96 well plates</td>
</tr>
<tr>
<td>• Laboratory Notebooks</td>
</tr>
<tr>
<td>• 15 &amp; 50 mL conical centrifuge tubes</td>
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<table>
<thead>
<tr>
<th>Items</th>
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<tbody>
<tr>
<td>• Labeling tape</td>
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<tr>
<td>• Dolphin tubes</td>
</tr>
<tr>
<td>• Microcentrifuge tubes</td>
</tr>
<tr>
<td>• Cryovials</td>
</tr>
<tr>
<td>• 1, 5, 10 and 25 mL serological pipettes</td>
</tr>
<tr>
<td>• Parafilm</td>
</tr>
<tr>
<td>• Plate sealer</td>
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If there is something specific you would like to see stocked in the store, please let us know.
Site Specific Lab Safety

1. Limited BSL2 use in the GCF (details to follow)
2. Location and access to MSDS in the GCF
3. Hazardous chemicals in the GCF
   1. Location
   2. Safe handling
   3. Overexposures and first aid for exposure
   4. Physical effects of exposure
   5. Selections and use of PPE
   6. Handling, cleanup and disposal of hazardous chemicals
BSL2 in the GCF

- A small BSL2 area is located in Room B20.
- This area is well marked with signs and red tape.
- ONLY pre-approved, specially trained persons eligible to enter this space. EH&S has trainings that need to be completed. GCF pre-approval and training required.
- The BSL2 agent is Human Saliva.
- Do not, under any circumstances, use any of the equipment in this area or rest personal items, etc. on the BSL-2 lab bench.
# Labeling and MSDS

National Fire Protection Association (NFPA)

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## NFPA Rating Explanation Guide

<table>
<thead>
<tr>
<th>RATING NUMBER</th>
<th>HEALTH HAZARD</th>
<th>FLAMMABILITY HAZARD</th>
<th>INSTABILITY HAZARD</th>
<th>RATING SYMBOL</th>
<th>SPECIAL HAZARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Can be lethal</td>
<td>Will vaporize and readily burn at normal temperatures</td>
<td>May explode at normal temperatures and pressures</td>
<td>ALK</td>
<td>Alkaline</td>
</tr>
<tr>
<td>3</td>
<td>Can cause serious or permanent injury</td>
<td>Can be ignited under almost all ambient temperatures</td>
<td>May explode at high temperature or shock</td>
<td>ACID</td>
<td>Acidic</td>
</tr>
<tr>
<td>2</td>
<td>Can cause temporary incapacitation or residual injury</td>
<td>Must be heated or high ambient temperature to burn</td>
<td>Violent chemical change at high temperatures or pressures</td>
<td>COR</td>
<td>Corrosive</td>
</tr>
<tr>
<td>1</td>
<td>Can cause significant irritation</td>
<td>Must be preheated before ignition can occur</td>
<td>Normally stable. High temperatures make unstable</td>
<td>OX</td>
<td>Oxidizing</td>
</tr>
<tr>
<td>0</td>
<td>No hazard</td>
<td>Will not burn</td>
<td>Stable</td>
<td>Radioactive</td>
<td></td>
</tr>
</tbody>
</table>

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![NFPA Rating Explanation Guide](chart.png)

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This chart for reference only - For complete specifications consult the NFPA 704 Standard
Labeling

• Laboratory doors have signs on them indicating the major classes of hazards associated with working in that area
  • LS B21, which houses the confocal microscope, has two lasers. Special laser training is needed.
  • LS B20, has a small BSL2 area, clearly marked. Special EH&S and GCF training needed if you work in the BSL2 area within B20.
    • See Kim for more information.
Location and access to MSDS in the GCF

• MSDS for the chemicals in the GCF areas can be found
  • MSDSpro link from EH&S Website:
  • Chemical manufacturer or distributor.
  • Laboratory Safety Manuals – distributed to each PI.
  • If unable to locate an MSDS, call EH&S at 817-272-2185

• Examples of useful sections in an MSDS
  • Hazards identification
  • First-aid measures
  • Accidental release measures
  • Exposure controls/personal protection
  • Stability and reactivity (storage)
  • Toxicological information
Location of hazardous chemicals in the GCF

- LS B24: Small corrosive/acid cabinet, labeled chemical cabinet
- LS B22A: Developer and Fixer
- LS603: 2 Large Flammable cabinets, labeled chemical shelf; compressed Nitrogen gas
- ERB 484B: Developer and Fixer
- ERB 478C: Labeled chemical shelf
Corrosives

- Acidic or caustic (acid or base) and is capable of destroying human tissue. Acids can also destroy metal.
  - Acids: sulfuric acid (battery acid), hydrochloric acid (acid bath)
  - Bases: sodium hydroxide (drain cleaners), ammonium hydroxide

- **Acute (Immediate) Effects** - Destruction of tissue, irritation of mucous membranes, respiratory irritation, difficulty breathing, headache, intense pain in eyes (possible loss of vision), nausea.

- **Chronic (Delayed) Effects** - Destruction of respiratory tract, destruction of digestive system.

- *Special Note: Acute or chronic exposure to hydrofluoric acid can cause deterioration of bones and even lead to death. Always seek medical attention. Go to the **MSDS** website for more information.*
Flammables

• Acute (Immediate) Effects - headache, dizziness, nausea, dry and irritated skin, watery and stinging eyes, inflammation of eyelids.

• Chronic (Delayed) Effects - general damage to lungs, liver, kidneys and other systemic functions as well as possible cancer risk.

• Store in proper cabinets, keep containers closed when not in use, do not use near flame or ignition source.
Oxidizers

• Oxidizers are substances that supply oxygen to the fire as they burn.

• Organic peroxides: benzoyl peroxide, perchloric acid

• Other oxidizers: concentrated nitric acid, sodium hypochlorite (bleach)
Reactives

Reactives are compounds that are capable of catching fire or exploding if subjected to certain conditions.

- Phosphorous Trichloride, Acetyl Chloride, Benzoyl Chloride, Thionyl Chloride, Vinyl Chloride

- **Fire Hazards:**
  - Pyrophorics ignite when exposed to air (diethyl zinc).
  - Water reactives react violently with water to form dangerous and flammable gases (sodium metal).

- **Explosion Hazards:**
  - Shock sensitive compounds can explode if shaken or dropped (picric acid).
  - Peroxide formers form explosive compounds when exposed to air (ethyl ether).
  - Explosives can explode if subjected to sudden shock, pressure, or high temperature (picric acid).
Irritants & Allergens

• Irritants are materials that cause inflammation on contact with the body surface.
• Irritants can also cause changes in respiration and lung function.
  • **Examples:** acetic acid, sulfur dioxide, sulfuric acid, formaldehyde
• Allergic reactions can be caused by chemicals used in the lab or from handling organic matter including animals. Reactions may be immediate or delayed.
  • **Examples:** formaldehyde, isocyanates, benzylics, phenol derivatives
Asphyxiants

- Asphyxiants are chemicals that deprive body tissues of oxygen. They are divided into two types, *simple* and *chemical*.
- **Simple asphyxiants** act by diluting or displacing atmospheric oxygen, which lowers the concentration of oxygen in the air.
  - Breathing air with low oxygen concentration can result in insufficient oxygen in blood and tissues, causing headache, unconsciousness, and eventually death. **Inert gases, such as helium and nitrogen, are simple asphyxiants.**
- **Chemical asphyxiants** prevent uptake of oxygen in the blood.
  - Carbon monoxide for example, binds more strongly to hemoglobin in the blood than oxygen does. This binding leaves insufficient hemoglobin available for oxygen uptake into the blood and transport to the tissues. **Common chemical asphyxiants include hydrogen sulfide, carbon monoxide and cyanogen.**
Compressed Gas Hazards

• A compressed gas is a gas or mixture of gases in a container that is under pressure.
  • Nitrogen, Air, CO2

• Ventilate area where gases are used.
• Identify cylinders by name, not color.
• Firmly close valve when not in operation.
• Keep valve protection cap on cylinder when not in use.

• **Firmly secure cylinders during storage and use.**
Personal Protective Equipment

- What you use depends on the agents you are working with. YOU are responsible for your own PPE:
  - Lab coat
  - Gloves
  - Eyewear
  - Respiration Protection (see next slide)

- Other precautions:
  - Closed toe shoes
  - Long Pants
  - Long Hair tied back
Personal Protective Equipment

UTA Respiratory Protection Program:
• UT Arlington has implemented a Respiratory Protection Program developed in consistency with Occupational Safety and Health Administration (OSHA) standards.
• Engineering Controls such as Ventilation and Fume Hood are the most widely applied methods for reducing the concentration of airborne substances. As a backup to Engineering Controls the use of Respirators is recommended.
• Please contact EH&S at 817-272-2185 or Elisabeth Rowlett rowlett@uta.edu for hazard assessment, medical evaluation info, respirator fit testing, and pricing prior to purchasing.
• Employees (including students paid by PI or Department) participating in the respiratory protection program do so at no cost to themselves. The expense associated with training, medical evaluations and respiratory protection equipment will be covered by the respective Principal Investigator (PI) or the employee’s Department.
Handling & Disposal

• Waste must be stored in compatible containers, labeled and must be kept closed except while filling.
• Waste containers must be stored in secondary containment (plastic tubs, provided by EH&S upon request).
• A Request for Disposal Form form must be submitted to EH&S once the waste container is full – Kim or Melissa will do this.

• **Do not pour chemicals down the sink.**
UTA Spill Clean-up Procedures

• **If a spill is an immediate threat to life or health:**
  • Leave area (close door if necessary) and notify persons nearby.
  • Call EH&S at 817-272-2185.
  • Contact UTAPD at 817-272-3003.
  • Provide specific and detailed information to responders.

• **If a spill is minor:**
  • If trained, use a spill kit to clean up. Dispose of waste through the hazardous waste disposal program. If needed, reference the Laboratory Safety Manual.
  • If not trained, call EH&S at 817-272-2185 for assistance.
  • Prevent others from entering areas.

• **For ALL spills: Contact the GCF at 817-272-9636**
GCF Laboratory Safety

• Eye wash station and shower are located directly inside the door to B24.
• Please provide your own PPE (personal protective equipment).
• Disposal of gloves, tips, and all other lab supplies used with BSL2 samples should be made in the cardboard Stericycle containers with a red biohazard bag inside. When these boxes become full, notify Melissa or Kim for a replacement.

• No chemicals or biohazardous materials may be poured down laboratory sinks. Please dispose of chemicals in the containers to the right of the sink and log the volume and name on the tag.
Laboratory Safety

- If you are using the gel dock and have ethidium bromide in your gel, please do not touch any common surfaces with your gloves (door knobs, lights, etc.)
- Do not touch anything in the BSL2 area including the lab bench. BSL2 area clearly marked and reserved for specially trained persons (EH&S and GCF).
- Please remove your gloves before touching any clean surfaces.
- No food, drink or make up application are allowed in the GCF.
- If you are unsure of how to use or dispose of something, please ask Melissa or Kim.
Questions?

Please contact GCF with any additional questions.

Melissa  Muenzler@uta.edu  817-272-0090
Kim     Kimberly.bowles@uta.edu  817.272.9636

You have now completed the Genomics Core Facility Site Specific Training.

You are responsible for reviewing and understanding the GCF Site Specific Safety information in this presentation. If you ever have any questions, please contact a member of the GCF

Thank you!