**Standard Operating Procedure**

for work with

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| **Chemical name/class:** | **Nanomaterials** | **CAS #:** |  |
| **PI:** |  | **Date:** |  |
| **Building:** |  | **Room #:** |  |
|  | **Designated Work Area:** |  |

1. **Circumstances of Use:**

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| Nanomaterials are materials having one or more external dimensions, or an internal structure of 100 nm or less, which could exhibit novel characteristics compared to the same material without nanoscale features. |

1. **Potential Hazards:**

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| Be aware that toxicity of nanomaterials may be greater than for the parent material, and that their greater surface area may make nanomaterials more flammable, explosive, or reactive than larger particles of the same composition. The risks of fire/explosion/reaction increase with the amount of nanomaterial; researchers should bear this in mind if scaling up a process. |

1. **Engineering Controls:**

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| If aerosols may be produced, nanomaterials (and any suspensions of nanomaterials) must be handled in a chemical fume hood, exhausted biological safety cabinet with negative pressure ductwork, or other exhausted enclosure. Aerosols may be produced during any open handling of dry powder, and during open or pressurized manipulations of suspensions. It is recommended that labs post information sheets on materials used. |

1. **Work Practice Controls:**

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| * Label containers of nanomaterials with particle size along with other standard items required for the label.
* Set up a designated area for work with nanomaterials and suspensions thereof, and label it.
* Wet cleaning or HEPA vacuuming of lab equipment and exhaust systems is required prior to repair, disposal, or reuse.
* Change gloves regularly (at least every two hours) and wash hands at the time of the glove change.
* If using a HEPA vacuum, change the filter inside a chemical fume hood or biological safety cabinet.
* Keep containers closed as much as possible.
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1. **Personal protective equipment (PPE):**

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| * Standard nitrile laboratory gloves and a fully buttoned lab coat with sleeves extending to the wrists should be worn when handling nanomaterials. When handling suspensions or solutions, choose a glove that is protective against the solvent.
* If splashes may occur, wear goggles and a face shield. Otherwise, wear standard laboratory safety glasses.
* In cases where the arms or torso may be exposed to liquid suspensions or dry particles, wear Tyvek sleeves and/or gowns (or other air-tight non-woven textile).
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1. **Waste Disposal:**

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| Unwanted nanomaterials (unless fixed in a solid non-friable matrix) must be must be disposed of following your laboratory-specific chemical hygiene plan, and FIU’s policies. |

1. **Exposures/Unintended contact:**

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|  For an actual chemical exposure/injury:* Flush exposed eyes or skin with water for at least 15 minutes, then seek medical attention if needed.
* For situations with risk of inhalation exposure (including dry powder spills outside of a chemical fume hood), remove all persons from the contaminated area.
* Call 911 or 7-5911 from any phone to request assistance if needed. Contact EHS for exposure-related advice.
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1. **Spill Procedure:**

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| *Every lab working with nanomaterials in a form that could be spilled or released (dry particulate or liquid suspension) must have a plan for cleaning up spills, and supplies on hand for dealing with small spills. A supply of “Tack Mat” or similar adhesive-coated mats should be kept on hand. If dispersed spills of dry nanomaterials are possible (such as during synthesis reactions), a HEPA vacuum (preferably one with electrostatic-charge-neutralization features) is recommended. If the vacuum may be used for incompatible materials, maintain a log of vacuum use so that collection of incompatible materials can be avoided.* Unless there are other hazards (such as reactivity) associated with the nanomaterials, the following recommendations should be adequate.* If the nanomaterial spilled outside of a contained enclosure, place an adhesive mat at the room’s exit to reduce the likelihood of spreading nanomaterials outside of the room where the spill occurred.
* For small spills of liquid suspensions, absorb the spilled material with a suitable absorbent (determined in advance), then wet-wipe the affected area three times. Place all absorbent and PPE into a bag and seal, then submit as hazardous chemical waste through EHS Environmental Programs 7-2622 or 7-6849.
* For spills of dry nanomaterials in a chemical fume hood or other enclosure, wipe up the powder using a cloth dampened with a suitable absorbent, (determined in advance) or wet the powder with a suitable absorbent and then wipe with a dry cloth. Consider using electrostatic microfiber cleaning cloths, especially if the nanomaterial is likely to carry an electrostatic charge. Alternately (or in addition), a HEPA vacuum (preferably with electrostatic-charge-neutralization features) may be used for cleaning the spill (note above precautions about incompatible materials). Minimize the fume hood or enclosure opening during this process. Once spill has been cleaned up, wet-wipe the affected area three times to decontaminate the surface. Place any clean-up materials into a bag and seal, then submit as hazardous chemical waste through EHS.
* For spills of dry nanomaterials or major spills of liquid suspensions outside of a chemical fume hood or other enclosure, leave the area and request assistance from the spill response team by calling 911 or 7-5911 from any phone. Researchers should also contact the EHS whether or not they can safely clean up a spill.
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1. **Training of personnel:**

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| * All personnel are required to complete the online General Lab Safety session thru the EHS website. This session includes an introduction to general chemical safety.
* Training on lab-specific procedures is required for all personnel working with these materials, and must be documented (topics covered, date, employee names and signatures). Laboratory-specific training for work with nanomaterials must include information on the relatively greater hazards of working with nanomaterials, and on the uncertainty of health effects.
* All personnel shall read and fully adhere to the laboratory- and nanomaterial specific SOP, and shall document that they have read it by signing and dating the SOP.
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**“I have read and understand this SOP. I agree to fully adhere to its requirements.”**

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| **Last** | **First** | **Panther ID** | **Signature** | **Date** |
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