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|  ***Insert Laboratory Specific Name Here*** |
| **MinION Employee Training SOP** |

1. **Purpose**

This procedure outlines the steps for training personnel to acquire the skills and knowledge necessary to run the Oxford Nanopore MinION sequencer from initial sample quality control to the review of sequencing run quality metrics.

1. **Scope**

This document applies to all staff that operate the Oxford Nanopore MinION next generation sequencer and supervisors that oversee these operations. Training on the Oxford Nanopore MinION sequencer is a process that includes building a base of sequencing knowledge, observing the trainer perform the sequencing procedures, performing sequencing procedures under direct trainer supervision, and individually executing the sequencing procedures.

1. **Related Documents**

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| **Title** | **Document Control Number** |
| MinION Employee Training Form |  |
| MinION Trainer Designation Form |  |
| *“Lab-developed Risk Assessment/Mitigation Steps”* |  |

1. **Responsibilities**

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| **Position** | **Responsibility** |
| All laboratory staff | * Complete all necessary training requirements
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| Team Lead | * Determine the training needs for the laboratory team
* Ensure all staff are trained and evaluated according to this procedure
* Designate the trainer by completing the MinION Trainer Designation Form
* Create training plans, review training materials, and assign trainers as needed
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| Trainers | * Develop training materials
* Train staff as directed by the Team Lead
* Document training activities
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| Branch Chief | * Ensure applicable laboratory staff are accountable for completing all training and evaluation requirements described in this procedure
* Review and approve this procedure
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| Quality Manager | * Review training documentation
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1. **Training Information Resources**
	1. *Reference your laboratory SOP or the MinION SOP your laboratory uses here.*
	2. *Reference your laboratory-developed risk assessment/mitigation document here; this may be specific to the MinION or to the specific nucleic acid source.*
	3. Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, HHS Publication Number (CDC) 21-1112
	4. MinION Support Training Videos (select the videos relevant to your lab processes; add other videos as appropriate)
		1. [**MinION: A Portable, Real-Time DNA/RNA Sequencing Device**](https://www.youtube.com/watch?v=Wq35ZXyayuU)
		2. [**Flongle: For Rapid Nanopore Sequencing of Smaller Samples**](https://www.youtube.com/watch?v=62ATIxGYLKY)
		3. [**Loading an Oxford Nanopore Flow Cell**](https://www.youtube.com/watch?v=CC11Jlydqrc)
		4. [**RNA Sequencing with Nanopore Technology**](https://www.youtube.com/watch?v=2WGl9L5d4Zo)
	5. Required Reading *(select documents relevant to your lab processes; add other documents as appropriate)*
		1. MinION Flow Cell Check Protocol
		2. MinION Rapid Sequencing Protocol
		3. MinION 1D Genomic DNA by Ligation Protocol
		4. Oxford Nanopore Community Discussion Board
2. **Equipment/Materials**
	1. Oxford Nanopore MinION Sequencer
	2. Library preparation and sequencing reagents
3. **Safety Precautions**
	1. All BSL-2 practices, safety equipment, and facility design must comply with the requirements listed in the most current version of Biosafety in Microbiology and Biomedical Laboratories.
	2. Appropriate PPE must be worn at all times when working in the laboratory, including laboratory coat, gloves, and safety glasses (if splashes are anticipated
4. **Procedure**
	1. The trainee will build a basic understanding of MinION next generation sequencing (NGS) technology by:
		1. Reviewing the MinION support training videos (Section 5.4)
		2. Complete the required readings (Section 5.5)
	2. The trainer will perform all steps within the sequencing SOP in the laboratory while the trainee observes.
		1. The trainer will verbally walk the trainee through the entire sequencing process from the beginning to end using the operational protocol as a training guide (Section 5.5)
		2. This 1:1 review will cover initial sample quality control, preparing sample libraries, preparing the sequencing instrument, running the sequencing instrument, clean-up, and review of sequencing run quality control metrics.
	3. The trainee will perform all steps within the sequencing SOP under direct and full observation of the trainer.
		1. The trainer will quiz the trainee on multiple aspects of the protocol, including the questions below *(the laboratory should populate this section with questions relevant to their procedure*):
			1. *Describe how the MinION identifies signals from the library fragment during sequencing.*
			2. *What can be done if the library does not absorb by capillary action into the SpotON priming port?*
			3. *Why do you open the flow cell priming port and then add 200 µl?*
			4. *Why is it important to have greater than 800 active pores?*
			5. *What could cause a large number of unavailable/inactive pores after loading the flow cell?*
		2. The trainer will review the trainee’s quality control data as described in the sequencing protocol to assess the competency of the trainee.
	4. Once the trainee successfully performs a sequencing run under the observation of the trainer, the trainee will perform an unaccompanied sequencing run.
		1. The trainer will review the trainee’s quality control data and run data to assess the competency of the trainee.
	5. Is it the responsibility of the primary user to ensure that preventative maintenance is scheduled and executed.
		1. The trainee will observe proper user performed preventive maintenance.
		2. The trainee will perform user performed preventive maintenance.
		3. The trainer will assess the trainee’s ability to properly maintain the instrument according to established maintenance procedures.
5. **Continued Learning**
	1. Trainers and primary users should regularly attend Oxford Nanopore MinION webinars, read primary literature, and review new product releases.
	2. It is expected that trainers will try new protocols in the laboratory and teach new skills to primary users on a semiannual basis.
6. **References**
7. **Appendices**
8. **Revision History**

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| **Rev #** | **DCR #** | **Change Summary** | **Date** |
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1. **Approval**

Approved By: Date:

 Author

 Print Name and Title

Approved By: Date:

 Technical Reviewer

 Print Name and Title

Approved By: Date:

 Quality Manager / Designee

 Print Name and Title