Template Provided By:

Cancer Imaging Program

National Cancer Institute

Standard Operating Procedure

GEN-R209

[^{18}F]FMISO QC Testing, Review, & "Final Release"

1. **Purpose:** To describe the procedure for the final Quality Control (QC) testing, review of the final tests results, and release of the batch based on the final QC testing.

2. **Scope:** The processes outlined in this SOP for final Quality Control (QC) testing, review of the final tests results, and release of the batch, are conducted at the sites manufacturing [^{18}F]FMISO.

3. **Responsibilities:** To follow this procedure as written and to ensure that all results, control information, and raw data are documented as specified in dedicated Quality Control Laboratory Notebooks and recorded on the appropriate testing forms.

4. **References**
   - **4.1** USP 28 ‹821› Radioactivity
   - **4.2** USP 28 ‹823› Radiopharmaceuticals For Positron Emission Tomography—Compounding
   - **4.3** FDA Draft Guidance PET Drug Products—Current Good Manufacturing Practice (CGMP)—September 2005 (CDER)
   - **4.4** **GEN-Q211**, "Radiochemical Identification & Purity of [^{18}F]-Fluoromisonidazole ([^{18}F]FMISO) Injection by Radio-Thin Layer Chromatography Analysis"
   - **4.5** **GEN-Q212**, "Gas Chromatography Analysis of Residual Solvents for [^{18}F]FMISO and [^{18}F]FES "

SOP**: GEN-R209** Date:_____

Printed Name	Signature	Date
Author:		
Regulatory Approval:		

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4.6 **GEN-Q113**, "Radionuclidic Identity by Half-Life Determination"
4.7 **GEN-Q114**, "Bacterial Endotoxins by Limulus Amebocyte Lysate (LAL) Test"
4.8 **GEN-Q114A**, "Alternative Procedure for Bacterial Endotoxins by Limulus Amebocyte Lysate (LAL) Test Using the PTS (Portable Test System)"
4.9 **GEN-Q115**, "pH Testing of Final Product"
4.10 **GEN-Q117**, "Sterility Test"
4.11 **GEN-Q117A**, "Alternative Procedure for the Sterility Test"
4.12 **GEN-Q118**, "A Color Spot Test for the Detection of Kryptofix® [2.2.2]"
4.13 **GEN-Q118A**, "An Alternate Test for the Detection of Kryptofix® [2.2.2]"
4.14 **GEN-Q219**, "Chemical and Radiochemical Purity by HPLC for [^{18}F]FMISO"
4.15 **GEN-Q110**, "Filter Integrity Test by Bubble Point"
4.16 **GEN-M120**, "Documentation of Manufacturing Variances"
4.17 **MPR-[^{18}F]FMISO**, "Master Production Record for Synthesis of [^{18}F]FMISO"
4.18 **MBR-[^{18}F]FMISO**, "Master Batch Record for Synthesis of [^{18}F]FMISO"
4.19 **GEN-Q015**, "Investigating Out of Specification QC Test Results"

5. Forms

5.1 **Form MVR-001**, "Manufacturing Variance Report Form"
5.2 **Form FQC-010**, "[^{18}F]FMISO Final Product QC Test Results" Form

6. Policies

- Always observe radiation safety rules.

7. Materials and Equipment

- Refer to the specific QC Testing SOPs for the equipment and materials necessary.

8. PROCEDURES

8.1 Manufacture the [^{18}F]-Fluoromisonidazole as outlined in MPR-[^{18}F]FMISO, Master Production Record for Synthesis of [^{18}F]FMISO recording the control information in MBR-[^{18}F]FMISO-L####.

8.2 Once the final filtration is complete, the activity measured, and the test samples collected as per the MPR-[^{18}F]FMISO, begin the QC testing as per the following SOPs:

8.2.1 **GEN-Q211**, "Radiochemical Identification & Purity of [^{18}F]-Fluoromisonidazole ([^{18}F]FMISO) Injection by Radio-Thin Layer Chromatography Analysis"
8.2.2 **GEN-Q212**, "Gas Chromatography Analysis of Residual Solvents for [^{18}F]FMISO and [^{18}F]FES"
8.2.3 **GEN-Q113**, "Radionuclidic Identity by Half-Life Determination"
8.2.4 **GEN-Q114**, "Bacterial Endotoxins by Limulus Amebocyte Lysate (LAL) Test" or **GEN-Q114A**, "Alternative Procedure for Bacterial Endotoxins by Limulus Amebocyte Lysate (LAL) Test Using the PTS (Portable Test System)"
8.2.5 **GEN-Q115**, "pH Testing of Final Product"

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8.2.6 **GEN-Q118**, "A Color Spot Test for the Detection of Kryptofix® [2.2.2]", or **GEN-118A**, "An Alternate Test for the Detection of Kryptofix® [2.2.2]"

8.2.7 **GEN-Q219**, "Chemical and Radiochemical Purity by HPLC for [^{18}F]FMISO"

8.3 Record the final test results on **Form FQC-010**, "[^{18}F]FMISO Final Product QC Test Results" Form. The analyst should record their test results as they are performing the tests. The analyst should also initial and date **Form FQC-010** as well.

8.4 A reviewer or supervisor initials and dates in the last column indicating his or her independent check of the test results.

8.5 Perform an integrity test of the final filter as per **GEN-Q110.** Record the results of this test in the **MBR-[^{18}F]FMISO-L####.**

8.6 If the test results are not within the specifications, initiate an Out of Specification (OOS) Investigation as per **GEN-Q015**, "Investigating Out of Specification QC Test Results."

8.7 If the OOS cannot be resolved within a relatively short period of time (less than 2-3 hours) then the batch must be failed. Continue the investigation to determine the cause of the failure and determine the appropriate corrective action to prevent recurrence.

8.8 If the test results are all within specifications, release the batch for further administration to human subjects.

8.9 Submit the sterility test sample, as per **GEN-Q117**, "Sterility Test" or **GEN-Q117A**, "Alternative Procedure for the Sterility Test," to the Clinical Hospital Laboratory after a background radiation level is achieved (usually within 24-48 hours).

8.10 Although the sterility test is performed after human administration, a negative result is required for the final product batch to meet its final acceptance criteria.

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