Molecular Contamination Monitoring Metrics and QC Workshop

Workshop IndexDuration: 1 DAY

Use the index to navigate the workshop sections and open quick reference modals for scope, audience, outcomes, delivery, policies, and FAQs.

Quick SummaryOverview & OutcomesAgenda & Hands-onDeliverables & FAQs

Quick ViewWho Should AttendOutcomesDeliveryPoliciesFAQs

Quick Summary

Contamination ControlApplied WorkshopQuality Driven

Contamination Surveillance for Molecular Laboratory Reliability

Understand contamination signatures in molecular workflows, including carryover, aerosolized amplicons, reagent contamination, sample cross-talk, and workspace transfer.

Contamination SourcesWorkflow Risk

Design in-lab monitoring plans using environmental swabs, blank matrices, no-template controls, sentinel surfaces, and zone-specific sampling frequency.

Monitoring PlanEnvironmental Swabs

Interpret surveillance data with metric thresholds such as positivity rate, repeat contamination frequency, Ct drift, hotspot recurrence, and run rejection rate.

MetricsTrend Analysis

Link contamination events to process layout, material flow, staff practices, reagent handling, and equipment decontamination routines.

Root CauseProcess Mapping

Review contamination detection frameworks for PCR, qPCR, genotyping, library preparation, and post-amplification processing environments.

Platform ScopeMethod Transfer

Build a practical contamination monitoring dashboard to support routine QC review and targeted corrective action planning.

Dashboard DesignCorrective Action

Overview

Environmental MetricsCase BasedOperational Focus

Workshop Scope and Learning Outcomes

Examine how contamination risk differs across pre-amplification, amplification, post-amplification, storage, and shared-support laboratory zones.

Zone MappingRisk Segregation

Define fit-for-purpose surveillance metrics for routine monitoring, event investigation, trending review, and process capability checks.

Surveillance MetricsCapability Review

Develop sampling schemes that balance surface selection, frequency, analytical sensitivity, blank design, and action threshold justification.

Sampling StrategyThreshold Logic

Recognize false contamination signals caused by background nucleic acids, non-specific signal, carry-forward artifacts, and poor control interpretation.

Signal DiscriminationControl Review

Connect contamination trend data with cleaning validation, zoning discipline, workflow redesign, and operator retraining priorities.

Cleaning ValidationRetraining Actions

Identify who should attend, including assay developers, QC analysts, laboratory supervisors, validation teams, and contamination response leads.

Audience FitTeam Readiness

Agenda

Hands-on MetricsInteractive ReviewPractical Output

Agenda Flow and Hands-on Components

Session 1 maps contamination pathways and monitoring checkpoints across sample receipt, extraction, setup, amplification, and reporting workflows.

Pathway MappingCheckpoint Design

Session 2 builds an environmental surveillance plan using zone classification, sample location ranking, blank placement, and response escalation logic.

Surveillance PlanEscalation Logic

Hands-on exercise reviews mock contamination datasets to identify hotspots, repeated failures, transient events, and likely process drivers.

Dataset ReviewHotspot Detection

Participants draft action levels for monitoring metrics including

contamination positivity, recurring surface events, and control-triggered investigations.

Action LevelsInvestigation Triggers

Case discussion covers contamination episodes linked to reagent lots, workstation layout, pipetting practices, sample batching, and cleanup failure.

Case ReviewLot Impact

Final working block converts trend observations into a contamination reduction roadmap with monitoring ownership and follow-up checkpoints.

RoadmapMonitoring Ownership

Deliverables

Workshop ResourcesTemplate DrivenFAQ Included

Deliverables and Frequently Asked Questions

Participants receive a contamination surveillance worksheet, metric threshold table, hotspot review template, investigation checklist, and action tracking format.

WorksheetsTracking Tools

Frequently asked question: Is the workshop only about post-PCR contamination? No, it addresses risk detection across the full laboratory workflow.

Full WorkflowRisk Coverage

Frequently asked question: Are metrics discussed quantitatively? Yes, the workshop covers threshold setting, trend windows, recurrence scoring, and alert interpretation.

Quantitative ReviewAlert Logic

Frequently asked question: Can the framework support different assay platforms? Yes, the monitoring model is transferable

across multiple molecular methods.

Transferable ModelMulti Platform

Frequently asked question: What prior background helps? Familiarity with molecular workflows is useful, but contamination monitoring principles are explained clearly.

Accessible LearningWorkflow Familiarity

Participants leave with a draft monitoring plan and contamination response framework tailored to a selected laboratory scenario.

Draft PlanScenario Based

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