Special Issue

Collaborative Robotics and Total Laboratory Automation in Clinical Diagnostics

Message from the Guest Editor

This Special Issue will showcase clinically driven deployments of collaborative robotics and total laboratory automation across pre-analytical, analytical, and post-analytical workflows in diagnostic medicine. We welcome original research, implementation studies, multicenter pre/post-evaluations, structured reviews, and perspectives that quantify the impact on turnaround time, error rates, and quality metrics. Priority areas include cobot-enabled sample accessioning and logistics, robotic liquid handling for NGS and LC-MS, automated slide handling and digital pathology integration, clinical microbiology TLA, and interoperability with LIS/LIMS using HL7 or FHIR. Submissions must document validation statistics suitable for CLIA/CAP environments, traceability/chain-of-custody controls, and cybersecurity considerations. Manufacturer-led work should include independent clinical co-authors and transparent data access. The goal is to provide reproducible, patient-impacting results that help labs evaluate where robotics and automation deliver measurable gains, identify failure modes, and outline practical adoption roadmaps for small-, medium-, and high-volume clinical laboratories.

Guest Editor

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