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The Evolution of Smart Microbiology Labs: From Hands-On Procedures to Intelligent Automation

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Microbiology testing has traditionally relied on manual operations and visual interpretation, making standardization difficult and traceability limited. Exception handling depends heavily on human memory and handwritten records, leading to delays and inefficiencies. In 2023, we introduced Asia's first BD Kiestra automated microbiology system, which streamlines specimen inoculation and incubation, captures high-resolution images at custom intervals, and records all workflows for full traceability. This automation reduces manual workload, shortens training time, and enhances result consistency. It also allows medical technologists to focus on higher-value tasks, improving overall laboratory efficiency. Looking ahead, we aim to implement an AI-based colony recognition system to prioritize urgent positive cultures, accelerate reporting, and support earlier clinical decision-making. With these innovations, microbiology laboratories are entering a new era of smart automation and improved healthcare quality.



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