An End-to-end Robotic Platform for High-throughput Formulation Development of Biologics

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Formulation development of biotherapeutic products necessitates the systematic optimization of parameters such as buffer composition, pH, excipients, stabilizers, and surfactants to ensure product stability during manufacturing and throughout shelf-life. To address the complexities inherent in this process, we have designed a fully automated, end-to-end robotic platform that enables comprehensive formulation development with minimal manual intervention. This platform operates as an integrated laboratory system, facilitating the execution of nearly all formulation development steps for biological drugs, from preparation of large formulation libraries to stability and stress studies, and on-deck analytics. The implementation of this technology results in a substantial increase in experimental throughput and data generation, thereby enhancing the efficiency and robustness of biotherapeutic formulation development.