Key Words: Automation, miniaturization, fermentation.

Automation and miniaturization is currently a hot topic in many industries, and the Bioprocessing industry is no exception. The potential benefits of automating and miniaturizing our Microbial fermentation process development work include reducing our process development timelines by improving our throughput and making better use of available resources.

With these aims in mind, two systems have been implemented in UCB’s fermentation process development laboratories, namely the Ambr250 Modular system from Sartorius and the Freedom Evo 200 from Tecan. It has been demonstrated that the Ambr250 modular system is comparable to 5L scale glass STR’s over a range of parameters including growth, titre and cell viability. The disposable nature of the system has resulted in a significant saving of man-days per experiment. In combination with this, the Tecan robot has been used to both automate plate based assays and to enable rapid purification of protein samples ready for further product quality analysis to support a QbD approach.

In this work we have considered the challenges that will need to be addressed to reach the ultimate aim of a fully automated miniaturized Upstream Process development platform for E.coli.