



## PAT tools for fermentation processes

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# PAT tools for fermentation processes

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## ABSTRACT

The publication of the Process Analytical Technology (PAT) guidance has been one of the most important milestones for pharmaceutical production during the past ten years. The ideas outlined in the PAT guidance are also applied in other industries, for example the fermentation industry. Process knowledge is central in PAT projects. This presentation therefore gives a brief overview of a number of PAT tools for collecting process knowledge on fermentation processes:

- On-line sensors, where for example spectroscopic measurements are increasingly applied
- Mechanistic models, which can be used to summarize process knowledge, to support experimental work, and also within design of PAT systems
- Small-scale equipment for high-throughput experimentation, a field which has been researched intensively during the past decade

The presentation ends with a short perspective on future developments