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Transfer Learning across Biopharma Molecules, Scales and Phases Based on Hybrid Semi-Parametric Modeling

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Quality by Design (QbD) guided process development is time and cost-effective only if knowledge is transferred from candidate to the next, from one scale to the other.

Nowadays, knowledge is shared across scales and candidates via technical risks evaluation. Though platform processes are widely used, this type of knowledge transfer is limited and every new candidate requires some degree of process development from scratch, leaving significant potential to accelerate process development.

In this contribution, we show how transfer machine-learning and hybrid modeling approaches can be exploited to transfer knowledge between scales, unit operations and molecules for a number of examples from mAb processes, Raman and cell & gene therapies. Further, we present a novel method for incorporating information about similar processes into the model generation to support selecting the ideal design for a new process in development. We will also highlight the importance of creating a concrete, standardized, and self-learning ecosystem so that all parties involved in process development and tech transfer may take benefit from such model-derived knowledge.

Keywords

Classification

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