DERIVATION OF PROCESS CONTROL STRATEGY FOR BIOSIMILAR – IS IT DIFFERENT FROM THE WAY CONTROL STRATGEY IS DERIVED FOR A NOVEL BIOLOGIC?

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Quality based development (QbD) has become the preferred choice for developing manufacturing process for any biologic drug. A proponent for this approach has been the US Food and Drug Association (FDA). Recently, the first QbD applications have been successfully filed with FDA. Biosimilars have also gained popularity in the recent past. Development of these drugs are very different from the way a novel biologic is developed. In the last five years, many companies around the world have started working on Biosimilars of which some companies have been able to successfully develop and get approvals for Biosimilars in both FDA and European Medicenes agency (EMA).

Application of QbD for a Novel and a Biosimilar drug is quite different. By nature of the requirement for developing a Biosimilar, quality of the 'reference product' against which the biosimilar is being developed is considered while making decisions during process development. Though the same concepts applies for a novel drug, the target quality profile is not as defined as one can write for a Biosimilar. This is because product quality information regarding the reference product is well-known and can be thoroughly analyzed and characterized. While the targets can be easily derived for a Biosimilar, deriving a process control strategy is tough.

Critical Process Parameter (CPP) is defined as a process parameter that has significant impact on the safety and efficacy of the drug. While this definition for CPP is applicable for a Bisomilar also, another aspect which requires consideration for a Biosimilar drug is the impact of process parameters on 'fingerprint biosimilarity'. Hence the classification of process parameters as those that are critical and those that are not is not as straight forward like for a Novel drug. Derivation of acceptance range for these parameters also is different – The acceptance range for CPPs when compared to that for a novel biologic is generally found to be narrow. This is because the desired range for the outputs (such as aggregates, glycan, charge, size variants etc.) is narrow owing to the product quality ranges observed for the reference product and not just the levels of the outputs which has an effect on safety and efficacy.

These subtle differences make deriving the process control strategy for a Bisomilar different from a novel biologic. In this presentation, a detailed overview of scale down model qualification, process characterization experiments, and the control strategy for Biosimilar manufacturing processes is provided. A case study will be presented which showcases some of these concepts of deriving control strategy as how it is applied for a Biosimilar process.