Assessing biosimilarity of following-on biologics based on a tolerance interval approach

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Abstract

The development of follow-on biologics products has received much attention from both sponsors and regulatory authorities while more biologic innovator products are going to lost patent protection in the next few years. The biologic products are often produced through protein recombination procedures in living system, generally animal, plant or bacterial cells. The living systems used to produce biologics are highly complex and could be sensitive to vary minor changes in the manufacturing process. Thus, the development of biologic products is much different and more complicated because of the fundamental differences in functional structure and manufacturing process. According to the guideline published by the European Medicines Agency (EMA) of the European Union (EU), biosimilar products are expected to be similar, not identical, to the innovator biologics they seek to copy. Therefore, it is important to assess the similarity between a biosimilar and the innovator biologics for developing the biosimilar. In this presentation, we construct a biosimilarity index for assessing the similarity between the biosimilar and the innovator biologics based on the tolerance limits of the innovator biologic. The acceptance criterion is proposed to judge whether the biosimilar is similar as the innovator biologics. We also address consideration on the sample size determination of the biosimilar to ensure that the similarity between the biosimilar and the innovator biologics is maintained at a desired level, say 80 or 90%.

Keywords: biosimilars, innovator biologic, tolerance interval, biosimilarity index