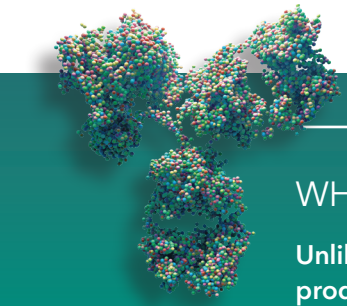
UNDERSTANDING BIOSIMILARS



WHAT IS A BIOLOGIC?

Unlike chemically synthesized products, which are typically small molecules, biologics are large, complex molecules that are isolated from living organisms, such as animal cells, bacteria, yeasts, and viruses[1,2]

In the United States, biologics must be approved for use by the Food and Drug Administration (FDA). Examples of biologics that are FDA-approved for therapeutic use include monoclonal antibodies, vaccines, and other therapeutic proteins.[3]

KEY TERMS THAT ARE USED TO DISCUSS BIOSIMILARS INCLUDE[4]:

REFERENCE PRODUCT
An FDA-approved biological product used as the comparator biologic for a biosimilar

BIOSIMILAR
A biologic that is highly similar to and has no clinically meaningful differences from the reference product in terms of safety, purity, and potency

WHAT CRITERIA MAKE A BIOLOGIC A BIOSIMILAR?

In order to be classified as a biosimilar, a biologic must[4]:

1. Be highly similar to the reference product notwithstanding minor differences in clinically inactive components.
2. Have no clinically meaningful differences from the reference product in terms of safety, purity, and potency.

HOW ARE BIOSIMILARS MANUFACTURED?

Like most biologics, biosimilars are developed using living cells or organisms, such as bacteria, yeasts, viruses, or other animal cells.[1,2] During production, manufacturers monitor several critical quality attributes to ensure that they fall within a range of normal variability of the drug product and will not adversely affect product safety or efficacy.[5]

WHAT IS BIOLOGIC DRIFT?

Over time, changes can take place in either the manufacturing process or the quality attributes of biologics.[5] Drift refers to unintended, unexplained, or unexpected change in either manufacturing process parameters or the final product over the product's lifetime. Drift may be gradual or sudden and occurs in any biologic drug.[6]

Drifts and shifts in biologics are highly regulated by international guidance, and quality control measures are in place to test that batches of biologics are "highly similar" to previous batches.[6] The FDA reviews manufactured biologics to be sure they are in range of normal variability.[7]

IS A BIOSIMILAR THE SAME AS A GENERIC DRUG?

Though biosimilars and generics are versions of reference products, their development, manufacturing, and approval processes are different.[1] Generics are typically small molecules that are manufactured to be identical to the reference product.[3] Biologic products like biosimilars are larger, more complex molecules and are often manufactured through the use of living cells.[2] Biosimilars are highly similar and have no clinically meaningful differences in safety, purity, and potency to the reference product, even though the molecular structures are not identical.[4]

The active ingredients of generic drugs are the same as those of brand name drugs, and the generic drug must demonstrate that it is bioequivalent to the brand name drug.[8]

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