Biosimilar Basics *for* Patients

What Patients Should Know About Biologics and Biosimilars

Advances in medicine have changed the way many diseases are treated. Increasingly, diseases such as cancer, rheumatoid arthritis, inflammatory bowel disease, multiple sclerosis, and even asthma are being treated with a category of medications called "biologics." Biologic medications are able to selectively target the causes of diseases in ways that were not previously possible, allowing patients to live healthier, more active lives. Today, hundreds of millions of patients worldwide have safely used biologic medications to treat various diseases and have benefited from the improved results.

This brochure describes biologic medications and a type of biologic known as biosimilars, which are highly similar to biologics but are typically less expensive for patients. The information is designed to help you make informed decisions about your health care treatment options.

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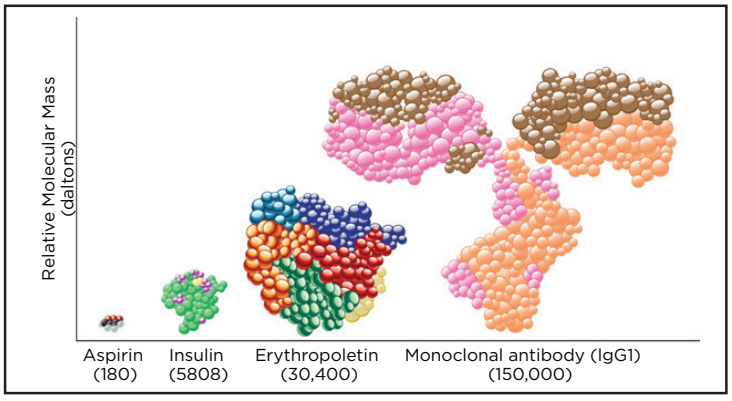
What is a biologic?

Unlike most traditional prescription drugs such as pills and tablets made through chemical processes, biological products are generally made from living cells and require highly complex production processes. Biologic medications include proteins, such as insulin, antibodies, and certain vaccines.

Antibodies are one type of biologic medicine that recognize and bind to very specific things within our bodies, similar to the way that a key fits into a lock. As we have learned more about how to make antibodies, we have been able to use antibodies to target things within our body that can lead to disease. These targets can include certain types of cells that attack healthy cells within our body, markers on cancer cells, or even some of the chemicals that our cells use to communicate with each other.

Other types of biologics can replace naturally occurring proteins in patients who are unable to make their own. One example of this is insulin. Insulin helps our bodies process and use the sugars (sometimes called carbohydrates) that we eat. When our body doesn't make enough insulin, it isn't able to use sugar effectively, and this can result in high blood sugar – a condition called diabetes. We can use synthetic insulin, which is a type of biologic medication, to help restore our body's ability to process and use sugars. Other biologics may help patients with certain blood disorders or immune system disorders.

Figure 1. *Size Comparison Between a Biologic Monoclonal Antibody Molecule and an Aspirin Molecule*

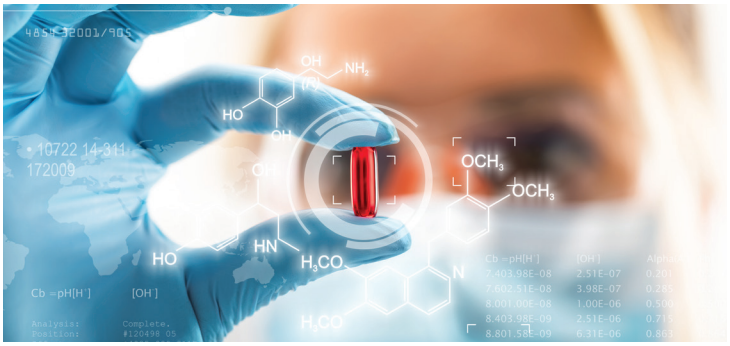


Source: Reference 1. Used with permission.

Before biologic drugs are ready to be used by patients, scientists and doctors spend years developing, researching, and testing them in clinical trials to ensure these drugs are safe and effective. Manufacturing a biologic drug can take months and every part of the process must be carefully checked and controlled. Even small changes in the manufacturing process or environment (such as changing temperatures) can make a big difference in the final product. Because biologics are so complex to develop and manufacture, they are often very expensive.

As shown in Figure 1, biologics are much larger and more complex than small-molecule drugs. Because biologics are so different from small-molecule drugs, the U.S. Food and Drug Administration (FDA) has a separate process for reviewing and approving them.

What is a biosimilar?



For many years, generic medicines have been available as less expensive alternatives of small-molecule drugs. Generic medicines are exact chemical copies of brand name drugs and offer less expensive treatment options for patients.

However because biologic medicines are derived from living cells, it is impossible to make an exact copy of a biologic medicine. In fact, all biologic medicines have slight variations from one manufactured batch to another manufactured batch because biologic medicines are derived from living cells, which constantly undergo change. This means that no one batch is an exact copy of another batch. However, it is possible to make a biologic that is highly similar to a biologic product. The original brand name biologic medicine is known as the "reference product," while the highly similar biologic medicine is called a "biosimilar."

Biosimilars are still relatively expensive to make. However, like small-molecule generics, biosimilars have the potential to provide cost savings to patients and the health care system. A report by the Association for Accessible Medicines (AAM) found that in 2020 the use of biosimilars saved the U.S. healthcare system $7.9 billion. Biosimilar medicines can help drive down prices by introducing competition and making medications more accessible to patients, including those who previously may not have been able to afford them.[2]

How do I know whether the biosimilar will work the same as the biologic?

The Biologics Price Competition and Innovation Act, which was enacted as part of the Affordable Care Act of 2010, created a pathway for the FDA to approve biosimilars. The FDA approval process for biosimilar medicines is very thorough, ensuring that all safety and quality standards are met. FDA approval of a biosimilar means that the biosimilar is highly similar to the reference product. The FDA checks for comparable purity, structure, and activity and requires that biosimilars, like the reference products, are studied in patients. This ensures that the reference product and the biosimilar product are clinically equivalent, with no clinically meaningful differences in safety or effectiveness. Since biosimilars are highly similar to the reference product, the FDA allows biosimilar manufacturers to rely on some of the same clinical data that the FDA used to approve the reference product. This means that biosimilar manufacturers can focus on demonstrating that there are no clinically meaningful differences between the biosimilar and the reference product, which the FDA has already determined is safe and effective. As a result, patients can expect to experience the same effects with either a reference product or biosimilar product. Of note, multiple biosimilar products may be approved for a single reference product. The FDA continues to monitor all biologics, and biosimilars, after they are approved and used by a larger number of patients.

Biosimilars are still relatively new. The first biosimilar in the United States was approved in 2015. There are currently over 35 FDA-approved biosimilar products available, with many more in development. To date, biosimilars have been found to be as safe and effective as the reference biologics.[3] More than 90 studies have been published that show switching from a biologic to a biosimilar is safe and effective.[4] In addition, some national health care provider organizations have published statements supporting the use of biosimilars to improve access to these therapies that otherwise would not have been available to patients due to cost.[5]

Will my pharmacist substitute the less expensive biosimilar for a biologic in the same way that he or she could do with a generic?

Although biosimilar medicines are like generics in some ways, they cannot be automatically substituted without an interchangeable designation. At the time of publication, there were only a few FDA-approved interchangeable products that can be substituted in the same way a generic product can be.

As a result, you must have a prescription specifically written for a biosimilar product to receive it. However, pharmacists can communicate with you and your doctor about whether a biosimilar is available and if it is a good option for you. Often, a biosimilar will have a lower out-of-pocket cost, although your insurance coverage may affect how much money you might save. Talk to your doctor or pharmacist to see if there are biosimilar options available. While biosimilars are not yet available for all biologics, several are currently on the market and many more are being developed

Licensed health professionals must use clinical judgment to ensure patient safety and optimal outcomes related to biologic medications. Regardless of whether you are using a biosimilar or the biologic reference product, it is important to know the name of the specific product that you are taking. Biosimilars can be referred to by three different names: the brand name, the core scientific name along with the manufacturer's name, and the core scientific name followed by a

Naming Convention	Sample Biosimilar Name
Brand Name	Imagine
Core scientific name with manufacturer's name	Imaginarymab Medmaker
Core scientific name followed by a random four-letter suffix	Imaginarymab-gxrm

random four-letter suffix. Any of the names for a biosimilar can be used, but most people find it easiest to use the brand name. Additionally, your pharmacist should keep a record of the manufacturer's lot number and your medicine's National Drug Code (NDC). The NDC is unique to each product and can easily distinguish between the reference product and the biosimilar or among multiple biosimilars. These are important because the reference biologic and all biosimilars for that product share the same core scientific name. There can be multiple biosimilar medicines for the same reference biologic. For example, a reference biologic called imaginarymab could have two biosimilar products called imaginarymab-gxrm and imaginarymab-ltsr. Currently approved biologics will be renamed so that they will also include a four-letter suffix. Make a note of the exact product you are taking so that you can be clear when talking to members of your health care team about your medicines.

What is an interchangeable product?

Interchangeable products are biosimilar products that meet additional FDA requirements and are permitted to be substituted, in a similar way as a generic drug, at the pharmacy without consulting the prescriber. Just like biosimilars, an interchangeable product must show that they provide the same clinical effect as the reference product. One of the requirements for being able to show this is conducting trials where patients are switched from the reference product to the biosimilar or vice versa without any decrease in efficacy or increase in adverse events. It is important to note that an interchangeable product is not clinically superior to a biosimilar.

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James G. Stevenson, PharmD, FASHP
Professor, Department of Clinical Pharmacy
University of Michigan College of Pharmacy

Biosimilar savings in 2020 source:

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