Regulatory Matters

A brief look at biosimilars in the United States

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The first recorded use of a biologic was by Edward Jenner in 1796.[1] Fast forward another century, and in 1922, 14-year-old Leonard Thompson received the first dose of insulin.[2] From a humble beginning through the process of punctuated equilibrium, biochemists through the ages have built on those early discoveries. Now there are in excess of 250 approved marketed biologics in the US formulary, including vaccines. Biologics encompass vaccines, blood components, allergenics, somatic cell lines, tissues, peptides, antibodies, and more.[3]

The approval process for new or novel biologics is costly and time consuming. On the whole, biologics come with a hefty price tag for patients. As with small-molecule drugs, generic biologics could encourage competition and decrease prices. The need for generic biologics and an abbreviated approval process is necessary; however, unlike small-molecule therapeutics, a biologic is generally a complex milieu.

Simply put, the bioequivalency rules that apply to small-molecule therapeutics do not work for biologics.

In an effort to bring down the costs of biologics, the FDA enacted the Biologics Price Competition and Innovation (BPCI) Act, signed into law by President Obama in 2009. The EMA had established comparable rules in 2005. The intent of the BPCI legislation was to provide a path forward for the creation of "generic" or interchangeable/biosimilar biologic drugs analogous to the current process for small molecules. Extrapolating, the net effect should be greater patient access and lower-priced biosimilar drugs.

The first biosimilar drug approved for use in the United States was ZARXIO® (filgrastim-sndz) in 2015. Without discussing the reasons behind the delayed adaptation of the BPCI Act, the latest printing of the FDA "Purple Book" lists 18 interchangeable/biosimilar drugs licensed for use in the United States (see Table 1).[1]

The use of biosimilars in Europe has lowered prices and, as a result, improved patient access. In some cases, availability of biosimilars has lowered the price of reference material, limiting sales of the biosimilar itself. As most biosimilars in the US market have been approved in the past 2 years, it is still too early to tell if the BPCI Act will result in significant cost savings to patients. However, the European data are encouraging. It is probably safe to say there will be price decreases in the US market and improved patient access as the BPCI Act gains more traction in the United States.[4-5]

References

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Table 1. Interchangeable/biosimilars licensed for use in the United States[1]

Product	*Proprietary Name*	*Date of Licensure*
adalimumab-adaz	Hyrimoz	October 30, 2018
adalimumab-adbm	Cyltezo	August 25, 2017
adalimumab-atto	Amjevita	September 23, 2016
bevacizumab-awwb	Mvasi	September 14, 2017
epoetin alfa-epbx	Retacrit	May 15, 2018
etanercept-szzs	Erelzi	August 30, 2016
filgrastim-aafi	Nivestym	July 20, 2018
filgrastim-sndz	Zarxio	March 6, 2015
infliximab-abda	Renflexis	April 21, 2017
infliximab-dyyb	Inflectra	April 5, 2016
infliximab-qbtx	Ixifi	December 13, 2017
pegfilgrastim-cbqv	Udenyca	November 2, 2018
pegfilgrastim-jmdb	Fulphila	June 4, 2018
rituximab-abbs	Truxima	November 28, 2018
trastuzumab-dkst	Ogivri	December 1, 2017
trastuzumab-dttb	Ontruzant	January 18, 2019
trastuzumab-pkrb	Herzuma	December 14, 2018
trastuzumab-qyyp	Trazimera	March 11, 2019