

# Understanding biological & biosimilar medicines

## Frequently Asked Questions

### Q. What is a biological medicine?

**A.** Biological medicines, including biosimilars, are derived or manufactured from a living biological system. They include hormones (e.g. insulin), enzymes (to speed up chemical reactions), blood factors (to regulate clotting), antibodies (to support the immune system), vaccines and advanced therapies (such as cell, gene and tissue therapy products).

Biological medicines are among many of today's most important medicines. By 2016, it is predicted that seven of the top ten medicines worldwide will be biologics.<sup>1</sup>

### Q. What is a biosimilar medicine?

**A.** A biosimilar is a biological medicine that is developed to be similar to an approved biological medicine (the 'originator' biological medicine) and can only be marketed after the patent and data exclusivity period has expired. As its name suggests, a biosimilar is not an exact copy of its originator biological medicine due to its complex molecular structure and unique manufacturing process. Manufacturers of biosimilars are required to demonstrate that there are no clinically meaningful differences between the biosimilar and originator biological medicine in terms of safety, quality and efficacy.<sup>2</sup>

### Q. What is a small molecule medicine?

**A.** Small molecule medicines are made by combining certain chemicals in a defined series of chemical reactions. Because these molecules are smaller and involve fewer process steps than biological medicines, they are easier to duplicate. This kind of medicine is often taken orally, most often as a pill.

**Generic medicine:** A medicine that contains an exact copy of the active pharmaceutical ingredient of the small molecule originator medicine.

**Biological medicine:** Biological medicines, including biosimilars, that have been developed in living organisms.

**Originator medicine:** The original medicine on which a biosimilar or generic drug bases its application for marketing authorisation.

### Q. How are biological medicines different?

**A.** There are several key differences between biological and small molecule medicines:

- **Molecular structure** – biological medicines are much larger and more complex than small molecule medicines.
- **Development and manufacture** – biological medicines have complex manufacturing processes that must be tightly controlled to provide a consistent product.
- **Immunogenicity** – due to their size and complexity, biological medicines have the potential to induce unwanted or unexpected immune reactions.
- **Administration** – most biological medicines, including biosimilars, must be administered by injection or infusion.
- **Transport and storage** – biological medicines generally degrade quickly if subject to high temperatures. Therefore, biological medicines, including biosimilars, usually need to be stored in a refrigerator.

## Q. How are biosimilars approved?

**A.** Due to their complex nature, biosimilars require distinct regulatory pathways from those applied to generic medicines. Biosimilars, like all biological medicines, must be approved centrally at European Union (EU) level.

Under European guidelines, manufacturers of biosimilars are required to demonstrate that there are no clinically meaningful differences between the biosimilar and the originator biological medicine in terms of quality, safety and efficacy.<sup>2</sup>

## Q. How is the safety of biological medicines, including biosimilars, monitored?

**A.** As with all medicines once biological medicines, including biosimilars, are approved, safety is closely monitored through a process called 'pharmacovigilance'.

All biological medicines, including biosimilars, are monitored according to the EU Pharmacovigilance legislation.<sup>3</sup> In addition, national competent authorities have to ensure that for the purpose of reporting suspected adverse reactions, biological medicines, including biosimilars, that are prescribed, dispensed or sold in their territory can be clearly identified.

Given the complexity of biological medicines and the fact that products from different manufacturers are similar but not identical; product-level traceability (i.e. collection of brand name and batch number) is especially important for suspected adverse reaction reporting.

## Q. How are biosimilars prescribed and used in clinical practice?

**A.** There are national variations in the regulations and guidance governing the prescribing and naming of biosimilars. This is significant in terms of the effectiveness of pharmacovigilance because information about brand name and batch number is needed when reporting suspected adverse reactions. The European Medicines Agency (EMA) evaluates biosimilar medicines for authorisation purposes. The EMA evaluations do not include recommendations on whether a biosimilar should

be used interchangeably with its originator biological medicine or biosimilars from other manufacturers.<sup>2,4</sup>

In the UK, the British National Formulary (BNF) and the Scottish Medicines Consortium (SMC) consider biosimilars as not interchangeable.<sup>5,6</sup>

In the UK, the Medicines and Healthcare products Regulatory Agency (MHRA) has issued clear guidance on appropriate use of biological medicines to ensure effective safety monitoring and tracking. This includes a recommendation to capture brand name and batch number when reporting suspected adverse reactions.<sup>7</sup>

## References

1. Pharmaphorum. Biosimilars 2012 - what does the current landscape look like? Available at: <http://www.pharmaphorum.com/articles/biosimilars-2012-%E2%80%93-what-does-the-current-landscape-look-like>
2. EMA Guideline on similar biological medicinal products (adopted September 2005, currently being revised) Available at: [http://www.ema.europa.eu/docs/en\\_GB/document\\_library/Scientific\\_guideline/2009/09/WC500003517.pdf](http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2009/09/WC500003517.pdf)
3. The European pharmacovigilance legislation. Available at: [http://ec.europa.eu/health/human-use/pharmacovigilance/index\\_en.htm](http://ec.europa.eu/health/human-use/pharmacovigilance/index_en.htm)
4. EMA. Questions and answers on biosimilar medicines (similar biological medicinal products). Available at: [http://www.ema.europa.eu/docs/en\\_GB/document\\_library/Medicine\\_QA/2009/12/WC500020062.pdf](http://www.ema.europa.eu/docs/en_GB/document_library/Medicine_QA/2009/12/WC500020062.pdf)
5. BNF. General guidance. Available at: <http://www.evidence.nhs.uk/formulary/bnf/current/guidance-on-prescribing/general-guidance>
6. SMC. Biosimilar Medicines. Available at: [https://www.scottishmedicines.org.uk/About\\_SMC/Policy\\_Statements/Biosimilar\\_Medicines](https://www.scottishmedicines.org.uk/About_SMC/Policy_Statements/Biosimilar_Medicines)
7. MHRA Drug Safety Update, November 2012: Reporting suspected adverse drug reactions to vaccines and biological medicines: please provide the brand name and batch number. Available at: <http://www.mhra.gov.uk/home/groups/dsu/documents/publication/con207196.pdf>

*The development of these materials has been funded by the Association of the British Pharmaceutical Industry (ABPI) Biosimilars Group. Members of the group include the BioIndustry Association (BIA), AbbVie, Amgen, Bristol Myers Squibb, MSD, Pfizer, Novartis and Sanofi.*