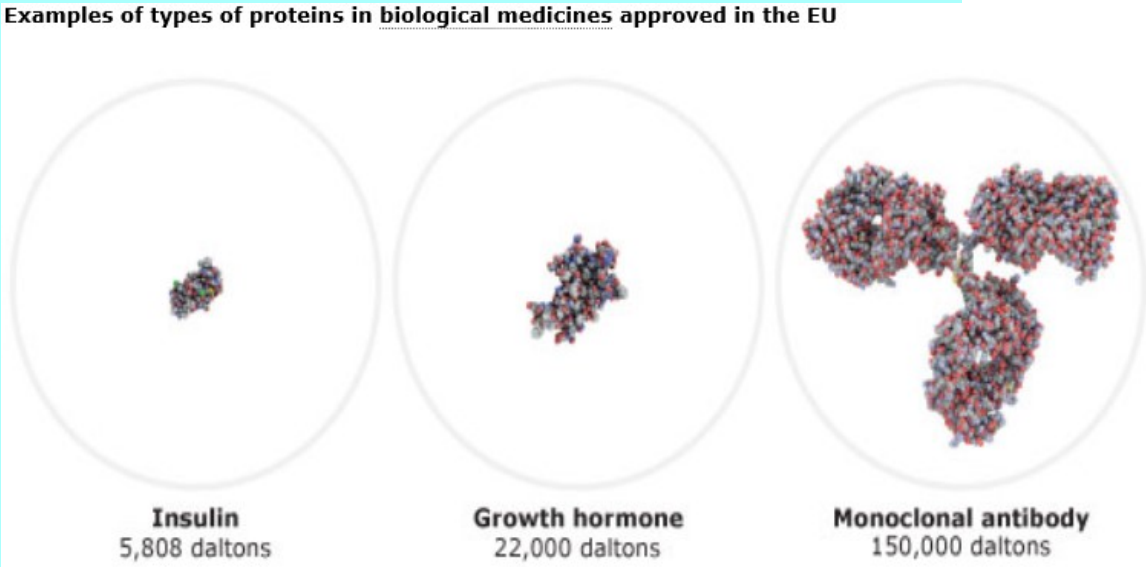
NHS Surrey Heartlands

Medicine Safety—BIOLOGICAL drugs

NHS

- **Biological medicines or "biologics" have been used in medicine since the 18th century— the NHS has been using biologics for decades—think insulin, vaccines, heparin, liraglutide…..**
- **Many modern biologics are used to modulate the natural immune response when treating cancers, severe asthma, or autoimmune disease such as arthritis, IBD, psoriasis. They can be extremely effective, but with the potential of devastating side-effects or adverse events for the patient (most commonly, reduced immune response = higher infection risk).**
- **Examples of these immunomodulating biologics include; rituximab, adalimumab, etanercept, ipilimumab, interferon beta, omalizumab, nivolumab**
- **Completely distinct from chemically synthesised drugs, biologics are made within a living cell, the drug molecule is unique to the cell that created it.**
- **Biologics are large, incredibly complex and delicate molecular structures—you are unlikely to find them in tablet form as they usually cannot survive the digestive process.**



For the attention of ALL prescribers

1. **Always record biologic use (incl. brand name) within the patient record, even if you are not prescribing them yourself. See guidance on the PAD for recording non-GP prescribed medication or please speak to your practice pharmacist/technician**
2. **Always** prescribe and dispense biologic drugs by **brand name** in line with MHRA guidance
3. Ensure **batch number is recorded** in the patient record if the practice administers a biologic drug
4. Encourage your patients to always **attend follow-up** and blood test appointments
5. Most biologics, and particularly the immunomodulators, should be used with **caution in pregnancy**. It is important that you discuss this with your patient if they are planning conception
6. For patients on **biologic immunomodulators**
   - Antibiotics might be required more urgently as they are at a much higher risk of infection and sepsis
   - Be aware that long dormant viruses such as varicella and hepatitis may be "reactivated"

What is a biological medicine?

People normally think of medicines being made with chemicals. However, biological medicines (including biosimilar medicines) come from living organisms, such as living cells that have been modified using biotechnology. This allows these living organisms or cells to produce the active substance of the biological medicine. This active substance is then harvested from the cells. These active substances (e.g. proteins) are usually larger and more complex than those of non-biological medicines.

What is a biosimilar medicine?

A biosimilar medicine is developed to be **highly similar** to an existing biological medicine. This existing biological medicine is a medicine that has already been approved and is used in the EU and referred to as the reference medicine. After the reference medicine comes off patent and finishes its exclusivity term, the biosimilar medicine is allowed to come onto the market.

Highly similar means that the biosimilar and its reference medicine are essentially the same, though there may be minor differences in their active substances. These minor differences are due to the fact that these active substances are usually large and complex molecules and that they are made by living cells. Some degree of variability is inherent to all biological medicines and minor differences may occur among different batches of the same biological medicine.

Differences may also be observed following changes in the manufacturing process of a biological medicine.
Such changes are carefully regulated by the European Medicines Agency.

The biosimilar and its reference medicine can be compared to leaves on a tree: they appear the same and serve the same purpose, but under the microscope, there will be a very small degree of difference due to the fact they are based on biological processes.
However, biosimilar medicines go through an intensive scientific assessment before marketing to ensure that, despite these small differences, they can be expected to be as safe and effective as the reference medicine.

Consecutive batches of the same biological medicine may show a small degree of variability (yellow shadow) within the accepted ranges, for example in glycosylation (sugar molecules attached to the protein, which are represented by small blue triangles). The amino acid sequence (represented by circles) and biological activity of the protein remain the same in all batches, even when these minor differences in sugar chains are present.

Useful links

https://www.ema.europa.eu/en/documents/leaflet/biosimilars-eu-information-guide-healthcare-professionals_en.pdf

https://www.gov.uk/drug-safety-update/reporting-suspected-adverse-drug-reactions-to-vaccines-and-biological-medicines

https://www.abpi.org.uk/media/1391/biological_biosimilar_medicine_uk.pdf

https://surreyccg.res-systems.net/PAD/