lStreptomycin –

* Selman Waksman, Albert Schatz, Elizabeth Bugie 🡪 1943
* 1st Aminoglycoside antibiotic
* *Streptomyces griseus*
* Widely used against Tuberculosis
* Stored around 2-8oC, Shelf life – 36 months
* Can cause severe side effects like hearing loss, vision changes, chills, easy bleeding, dizziness, etc.

Chlortetracycline –

* Benjamin Minge Duggar 🡪 1945
* 1st Tetracycline antibiotic
* *Streptomyces aureofaciens*
* Widely used for Veterinary purposes – treat conjunctivitis in cats, dogs, horses, etc.
* Can be stored frozen for 4 years
* Can cause side effects like gastrointestinal disturbances, and staining of teeth and bone, etc.

Erythromycin –

* Abelardo B. Aguilar 🡪 1952
* Macrolide antibiotic
* *Saccharopolyspora erythraea*
* Widely used to treat various respiratory infections, skin infections, intestinal amoebiasis, prophylaxis, etc.
* Stored in a cool, dry place in airtight containers, Shelf life – 2 years
* Can cause side effects like upset stomach, diarrhoea, vomiting, stomach pain, loss of appetite, etc.

Azithromycin –

* Gabrijela Kobrehel, Gorjana Radobolja-Lazarevski, and Zrinka Tamburašev, Slobodan Đokić 🡪 1981
* Macrolide antibiotic
* Derived from erythromycin
* Used to treat bacterial infections such as bronchitis, pneumonia, STD, infections of ears, lungs, sinuses, etc.
* Shelf life – 2 to 3 years
* Can cause side effects like stomach upset, diarrhoea, nausea, vomiting, abdominal pain, etc.
* **Criteria for a good antibiotic –**- It should be able to kill a variety of disease-producing microorganisms (“broad-spectrum antibiotic”)  
  - It should not produce undesirable side-effects  
  - It should not kill normal bacteria of the host
* **Other uses of antibiotics -**- As food preservatives, especially for fresh meat and fish  
  - For treating animal feed  
  - For controlling plant pathogens

**SERUMS**

* Serum means blood plasma from which fibrinogen has been removed. It may contain numerous chemical substances including antibodies / antitoxins.
* Serum = Blood Plasma - Fibrinogen (Coagulant)
* Antiserum is the antibody rich serum obtained from an immunized animal or individual
* **Preparing an antiserum:**
* **Step 1:** A small dose of bacterial toxin is introduced into the blood of a healthy animal like a horse or a cow.
* **Step 2:** The body produces antitoxins to neutralize the effect of the toxin.
* **Step 3:** After several injections of the same toxin, the blood of the animal is taken out.
* **Step 4:** On chilling, it clears as a straw-colored liquid that separates from the clot.
* This is called antiserum.
* Hepatitis, Rabies, Tetanus, and Snake bites are treated in the above way.

Serum helps in providing innate defense against microbial infections.  
Serum is mainly used to conduct medical tests like blood typing, i.e., a method to tell what type of blood you have, and for the preparation of antiserum.

The most commonly ordered serum tests are:  
- Hormone tests - Evaluate the amount of hormones produced by the endocrine system.  
- Serum Albumin Test - Tells the doctor how well your liver is working  
During the COVID-19 pandemic, blood serum was used in Convalescent plasma therapy. The therapy uses blood from people who've recovered from an illness to help others recover.

A serum is naturally synthesised by our bodies while in an antiserum, an animal or human is injected with a specific antigen and an antibody rich serum is produced.

**VACCINES**

A Vaccine is a preparation consisting of weakened or dead germ substances into the body.

Vaccination is the introduction of weakened or dead germ substances into the body for developing resistance to a particular disease.

Vaccines are available for several diseases such as cholera, typhoid, measles, chickenpox, etc.

All the ingredients of a vaccine play an important role in ensuring a vaccine is safe and effective. Some of these include:

* The antigen. This is a killed or weakened form of a virus or bacteria, which trains our bodies to recognize and fight the disease if we encounter it in the future.
* Adjuvants, which help to boost our immune response. This means they help vaccines to work better.
* Preservatives, which ensure a vaccine stays effective.
* Stabilisers, which protect the vaccine during storage and transportation.

**2 Common vaccines obtained from growing bacteria:**

Killed Bacteria – TAB vaccine for typhoid  
Living weakened bacteria – BCG vaccine for tuberculosis

**TOXOIDS**

Toxoids are altered forms of toxins (exotoxins secreted by bacteria) whose toxicity is weakened; however, their immunogenicity is maintained. As such, toxoids can cause a protective immune response but do not lead to active toxin-induced disease.

They are a kind of vaccine. They produce immunity against Diphtheria and Tetanus.

https://youtu.be/VHpAs1sLfgs

https://youtu.be/3T5bksMdSmM

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