

Mechanisms of Anaemia:

What is Anaemia and the Red Blood Cell Role?

- Anaemia is a **reduction** in the **number of red blood cells** OR a **reduction in the quantity of haemoglobin**.
- Red blood cells are needed to **transport oxygen around the body**. They have thin cell membranes which allow **oxygen** and **carbon dioxide** to diffuse rapidly and bind to the haemoglobin.
- The red blood cells are **biconcave discs** and **oval** in shape. They develop in the **bone marrow** and **LACK a nucleus**.
- Red blood cells contain **haemoglobin** which has to remain in the red blood cell because **FREE haemoglobin is TOXIC**:
 - 1) Free haemoglobin would bind to **nitric oxide** causing nitric oxide deficiency.
 - 2) Free haemoglobin would also **block + damage** the **kidneys**.
- **2.4 million red blood cells are made every second**
- **25 trillion red blood cells are in the average adult**.
- Each normal red blood cell:
 - 1) **LASTS FOR 120 DAYS**.
 - 2) **Passes through the heart 170,000 times**.
 - 3) **Travels 200km**.
- A red blood cell is **UNABLE**:
 - To synthesise RNA.
 - To synthesise protein after 24 hours → can only synthesise protein in these first 24 hours due to residual **RNA** - these early red blood cells are called **reticulocytes**. *It is thus unable to **repair** itself.*
 - Use oxygen (although they transport it). **Only anaerobic**.
- A red blood cell is **ABLE**:
 - To **metabolise glucose** to **ATP** for energy.
 - **Generate NADPH**.
 - **Catabolise RNA**.