# Homeostasis

## Controlling conditions:

- The conditions need to be kept constant to keep the body working correctly
- The conditions inside the body are called the internal environment
- It's important to keep conditions constant to the cells can function properly, for example, enzymes can work in the optimum conditions
- Homoeostasis is the maintenance of a constant internal environment
- It is the regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to internal and external changes

## Control system:

- Stimulus - changes in the environment.
- Receptor - cells that detect changes in the environment.
- Coordination centre - areas they receive and process information, such as the brain, spinal-cord and pancreas. They coordinate a response.
- Effector - muscles or glands that bring about a response between store optimum levels.

## Water and mineral ions:

- Water and mineral ions: enter the body through food and drinks.
- Water is lost: from the lungs through breathing, from skin as sweat, and in urine.
- Mineral ions are lost: from the skin in sweat and from kidneys in urine.



## Negative feedback and stimulus':

- Negative feedback is when the item being monitored deviates from the norm and the body then will respond to get it back to normal.
- The body responds to a change in the environment, this is a stimulus.
- A stimulus can be light, sound, touch, pressure, pain, a chemical, a change in position or temperature.
- Receptors of an automatic control system detect when the level of something is too high or low, for example, water and temperature.
- Resect send this information to the coordination Centre.
- The coordination Centre processes the information and organise a response from the effectors.
- The effectors respond to counteract the change and bring it back to optimum.
- The mechanism that restores the optimum level is called the negative feedback mechanism.

## The nervous system:

- Stimulus - changes in the environment to which the body responds.
- Receptor - cells which detect a stimulus and produce an electrical nerve impulse.
- Sensory neurone - carries electrical nerve impulses from the receptors to the central nervous system.
- Central nervous system - interprets information collected by receptors, then processes the information and decides and controls responses.
- Motor neurone - carries electrical impulses from the central nervous system to the effectors.
- Effectors - carries out a response in the muscles and glands.

- Combined pill: contains two hormones which stop ovulation (stop the ovaries from producing eggs.) As Long as it is taken properly it is almost 100% reliable. Can have side effects
- Progestogen only pill: contains one hormone (progestogen) it alters the lining of the womb and causes changes in the cervical mucus. This makes it very difficult for sperm to enter the womb or an egg to settle there. 99% efficient as long as taken at the correct time.
- Injection: an injection of the hormone is given every two-three months. The hormone is slowly absorbed into the body and works similarly to the combined pill. 99% reliable.
- Implant: small rods containing hormones are inserted under the skin in the upper arm. Hormone is slowly released and lasts five years. Risks of side effects but 99% reliable.
- Diaphragm: forms a barrier to prevent the sperm from meeting the egg. The sperm are made inactive by spermicide. Could cause bladder infections. 92-96% effective.
- I.U.D (intrauterine device): prevents the implantation of a fertilised egg. Not suitable for all women. 98-99% reliable.

## Infertility:

This is when a couple can't conceive naturally.

- Female causes:

1. Ovaries not releasing eggs
2. Blocked Fallopian tube
3. Problems with uterus lining
4. Hormonal problems

- Male causes:

1. Low sperm count
2. Poor quality of sperm
3. Blocked or damaged tubes that carry sperm
4. Hormonal problems



Problems with infertility drugs:

- They don't always work
- Can be expensive
- Too many eggs could be stimulated
- Can lead to unexpected multiple births

## In Vitro Fertilisation treatment:

1. FSH and LH are given to the woman to stimulate the maturation of multiple eggs
2. Eggs are collected from the woman ovaries
3. The eggs are fertilised in a lab using the man's sperm
4. The fertilised eggs then grow into embryos in a laboratory incubator
5. Once the embryos are formed one or two of them are transferred to the woman's uterus.

Transferring more than one improve the chances of pregnancy

Advantages:

- It gives an infertile couple a child

Disadvantages:

- Multiple births this is risky for the mother and babies
- Success rate is low at 26%, this makes the process emotionally stressful