

Biology

Bridging Task (BT)

Applications of Biology.

Choose one of the following—

- Lifestyles and Diseases
- Therapeutic uses of stem cells
- Uses of enzymes

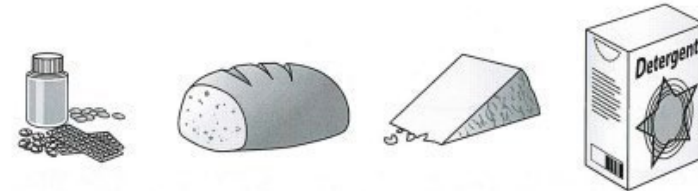
Use of Enzymes in Industry

The use of enzymes from bacterial and fungal cells has occurred for over a thousand years in processes such as baking, brewing and cheese-making.

Enzymes are very useful in industry due to some special features. They:

- allow reactions to occur at lower temperatures;
- are specific;
- can be used over and over again;
- can be produced in bulk, using micro-organisms.

Enzymes are used in a variety of processes, such as **food manufacture**, the production of **medicines** (pharmaceutical compounds) and **analytical** methods. There are hundreds of different enzymes that are used in many different commercial applications.



You may have carried out a number of practical investigations using enzymes during your biology course and may be familiar with the role of enzymes in breaking down large molecules.

Task

Research the commercial uses of enzymes, with one example from each of the following industries:

- Food industry
- Analytical sciences
- Pharmaceutical industry

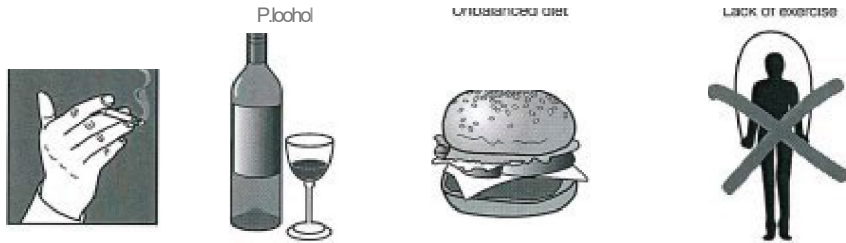
Prepare a poster, PowerPoint presentation or a leaflet that covers the following points:

- What example you have chosen and the reasons behind your choice.
- The substrates, enzymes and products involved in your choice.
- The key features of the enzymes chosen.
- A discussion of the importance of the commercial application of these enzymes.
- Explanations of any advantages and disadvantages in using these enzymes.

Lifestyles and Diseases

Unhealthy lifestyles have a great impact on our health. Some of the most common lifestyle factors that lead to chronic diseases are more evident, such as smoking, drinking alcohol, and eating a diet high in fat and sugar. These diseases include heart disease, diabetes, and cancer. There are now many campaigns highlighting these issues and encouraging people to lead healthier lives. We need to take action now to prevent these diseases from becoming a major public health issue.

For this is the best way to approach these problems and it is very important to make people aware of the consequences of their lifestyle choices. The risk of many associated diseases. Some of the major ones that have had a dramatic impact on health over recent years include:



All these risk factors are major contributors to the development of diseases such as heart disease, coronary heart disease, liver cirrhosis, and diabetes.

Task

Write an information leaflet highlighting the importance of a healthy lifestyle, that could be used as part of a healthy lifestyle awareness campaign in your school or college.

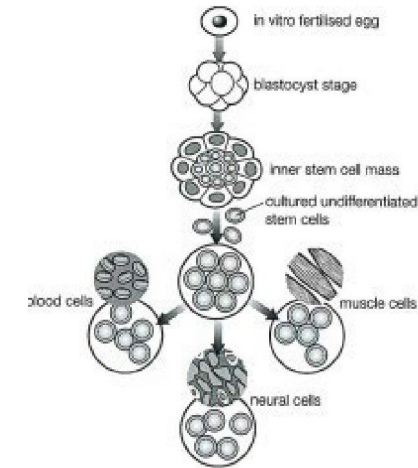
It should discuss a range of lifestyle choices and explain how these are linked to diseases. Your leaflet must include the following points:

- What is health and what is a disease.
- The effects of smoking cigarettes on the body and links to some common chronic diseases and in tobacco.
- How drinking alcohol affects physical and mental abilities.
- What is an imbalanced diet.
- The links between high fat and cholesterol in diet and coronary heart disease.
- What are cardiovascular diseases.
- The benefits of physical exercise on the body.

Therapeutic Uses of Stem Cells

Stem cells are special types of cells with the ability to self-renew by mitosis and to differentiate into all the different types of cells in the body. They are found in all tissues and are responsible for repairing damaged tissue. Some stem cells are found in the bone marrow, while others are found in the blood. They are also found in the skin and the gut. They are used to treat a range of degenerative conditions, such as multiple sclerosis and Parkinson's disease, and to treat the neurons and all other cells in the nervous system have been found to have the ability to function. There is great potential to use stem cells to achieve improved cells.

Although most of the research on stem cells is at an early stage, many scientists believe that stem cell treatment will one day be able to cure many of our most serious diseases and relieve suffering.



Task

Carry out research on the therapeutic uses of stem cells and prepare a presentation in the form of a poster or on PowerPoint.

Your presentation should cover the following points:

- What are stem cells and how they are different from body cells.
- Where stem cells are found.
- The difference between embryonic stem cells and adult stem cells.
- An explanation of the therapeutic uses of stem cells in Parkinson's and lymphomas.
- A discussion of the ethical issues for their use in therapy.
- A discussion of any risks of stem cell therapy.
- Who would benefit most from stem cell therapy.
- Why there are so many varied attitudes to stem cell research.