

## What's your favourite fungus?

# The One That Keeps Grandad Alive

Cholesterol is a type of fat that comes from animal products such as red meat and eggs. But humans can also make cholesterol – in addition to that obtained from the diet, the liver is also able to produce cholesterol. There are two forms of cholesterol. Cholesterol is needed for cell membranes and for the production of steroid hormones, but if we have too much it is stored in our blood vessels. Low density lipoprotein or LDL is the dangerous type; and high density lipoprotein (HDL) is the good type.

If we have too much cholesterol the body is not able to use up the excess. In such circumstances the excess cholesterol sticks to the inside walls of blood vessels. This build up makes the diameter of the blood vessels narrower and this restricts blood flow. If blood vessels that supply blood to the heart become clogged up like this it can cause a heart attack, because the heart muscle does not receive enough oxygen to function properly. This can lead to the death of a small section of the heart muscle, but in severe cases the heart attack can cause the person to die. So to control heart disease it is important that humans regulate their cholesterol level.

The most effective cholesterol lowering-agents are called Statins, and these are produced by fungi. The two fungi used to produce statins are called *Aspergillus terreus* and *Penicillium citrinum*.

Statins work by inhibiting the enzyme called 'HMG-CoA reductase' which is needed for the production of cholesterol. Statins block HMG-CoA reductase activity as they compete for the active site of the enzyme. If the activity of this enzyme is blocked the production of cholesterol is slowed down, and this in turn will significantly decrease the patient's cholesterol level. Statins also increase LDL-receptor production in the liver, which help clear the bad cholesterol from the blood stream.

Statins from fungi are of great importance as many people rely on them daily to help keep their cholesterol level normal, therefore reducing the risk of blocked blood vessels. There are three statin 'drugs' in the top five most widely prescribed pharmaceuticals – with annual sales in excess of £3 thousand million!

