

LIFE CYCLE OF HIV – Extension Work

In pairs, read carefully the transcript of Dr Iain Reeves' interview. After reading, select quotes in which Dr Reeves describes the life cycle of HIV in similar ways to that illustrated in the Wellcome Trust's animation.

After you have selected your quotes, compare your selections with another pair of students.

So let's talk about the viral life cycle. So the virus enters into the cell by interacting with a cell surface receptor. And it's the CD4 molecule which is present on the surface of CD4+ T cells, part of the immune system. Once in there, it uses an enzyme called a reverse transcriptase, which turns its single-stranded RNA - which is the nucleic acid that the virus has - into a double-stranded copy of that RNA, as DNA.

The double-stranded DNA is then integrated into the host cell's own DNA, inside the nucleus. And it uses another enzyme to do that, which is called integrase.

Later on, when that DNA is then transcribed out again as RNA, the RNA is used to make another long viral protein, the ribosome. And that protein is chopped up by an enzyme called protease - another viral enzyme - in order to make a virus particle that then buds from the surface of the cell, to go on to infect another cell.

Well, once inside the body, HIV attacks it by infecting the cells of the immune system. And what that means is that all viruses and all organisms are trying to make more copies of themselves, they're trying to reproduce, trying to make sort of baby viruses, if you like.

So in making... in infecting the T cells of the immune system and making more copies of itself, it gradually leads to a destruction of the immune system. Also, the immune system itself is trying really, really hard to actually control the infection, as well.

But for a number of reasons, and partly because the virus actually integrates itself into the host cell's DNA, that's really difficult to do. It can't actually clear the virus out. So another way that, actually, this damages the immune system is by kind of exhausting the immune system. The immune system kind of gives up after a while. It's trying really, really hard to actually get rid of the virus. But in the end it starts to lose out.

And what happens is that over the course of a period of years, usually, the immune system gradually becomes weaker. And at a particular point, the immune system will be so weak that the person with HIV is very, very vulnerable to infections and other illnesses that if you had a normal immune system you just wouldn't even notice.