DON’T. MOVE. The tone was serious, but the voice deadly silent. I froze. Silence for a second. I was about to keep moving until I heard it. A dragging sound, off in the distance. It slowly came into view. A massive, bulging monster with small tendrils projecting from its surface. Stopping every now and then to gobble something up or to investigate something with its tentacles—a macrophage. My partner looks at me and smiles: jackpot! They call me the Human Immunodeficiency Virus—HIV for short. Virus means poison and I got that name because I go after the immune system and because I infect humans. It’s just propaganda, and typical human arrogance. I was infecting chimpanzees long before I ended up in humans! I’m the most feared of my kind because I’m hard to detect and even harder to kill. My biggest threat are T-cells. They’re the snipers of the immune system, they can detect me and hunt me down and if they do, I’m in big trouble. My way around them is to sneak inside them and hide—talk about hiding in plain sight! What’s even better is that the human I’m attacking won’t know I’m here until it’s too late. Sympathy? No, I don’t feel any of that. After all this is war. We build our weapons and they build theirs. They have this awful thing called a vaccine. It trains the immune system and tells it what to look for so it’s ready when we attack. They got it because some other viruses like smallpox were being reckless. They go in all guns blazing and are surprised when they get caught. It was this recklessness that led to the vaccine. They don’t have a vaccine for me though. I’m too sneaky for that. Me and my partner are both HIV, but we wear different disguises. We’re always changing the way we look so that the immune system doesn’t know what to look for. It also means if one of us gets caught, we don’t blow the other’s cover. My job is to get inside and break down their defences. After that they
won’t be able to defend against the others, even if they
have the vaccine. Clever right? That’s why we’re so happy.
That thing lumbering towards us is a macrophage; it’s a
clumsy cell of the immune system that wanders around
looking for troublemakers like us. We’re going to grab
onto it and sneak inside. Once we’re in we’ll start building
our numbers for our next attack.

We watch carefully as the macrophage slowly passes,
we’re looking for something. A protein called CD4. The
macrophage uses it to talk to other cells and to call for
reinforcements. See, CD4 is like a lock and although I
don’t have the key, I know how to break in. We make a
run for it. This is our big moment, this is the last place
we can get caught. Once we’re inside we can’t be stopped.
We’re almost there. I look over to congratulate my
partner but he’s celebrating too early. He hasn’t noticed,
but there’s something on his back. It’s another weapon
called complement. It’s sticky and makes you look tasty
to macrophages. Suddenly one of the tentacles shoots
out from the cell and swallows my partner whole. A
horrible fate awaits him inside. He’ll be taken deep inside
and destroyed. What’s worse is that because he’s been
caught, the immune system will be on the lookout for
us. The mission won’t die with him though, because I’ve
made it to the door. My first goal is complete, but now
I’m alone. That’s alright though because I’m going to use
the resources in the cell to make lots of copies of myself.
I ditched my disguise when I entered the cell, so I must
work fast. What makes me different from other viruses is
my toolkit. I have this enzyme called reverse transcriptase
(RT). It’s a mouthful I know, and it’s heavy, but it’s vital
to my mission. The problem is I’m made of RNA. RNA
is similar to DNA, but it’s only made of one strand and
isn’t as stable, so I have to use it quickly. I need to take
advantage of a machine in the cell called a ribosome. If
I give it DNA, it will build my reinforcements for me.
Problem is that the ribosomes don’t understand RNA,
so I have to turn my RNA into DNA using my RT. It’s
perfect because the cell does all the hard work for me,
and they have no way of telling what’s theirs and what’s
mine! I’ve been doing this for generations, I’m a total pro
and to tell the truth it’s easy. All I have to do is… wait.
Where’s the…? Something’s wrong.

Two weeks earlier…

Fluorescent lights, phones screeching, coughing,
wheezing, screaming kids. I can barely breathe through
the smell of disinfectant. It feels like hours pass before
my name is called. I walk down the hall like a zombie,
the same way I’ve been for the past month. The doctor’s
words echo in my ears: “HIV isn’t a death sentence
anymore, there are things we can try.” The past few
weeks had been excruciating. Sleepless nights, reading
newspaper articles and journals trying to make sense of
the mountains of jargon. I take a seat in the doctor’s office,
the bags under his eyes suggest he’s getting less sleep than
me. “How are you feeling?” I don’t know why he’s asking,
I look like death warmed up. “I’ve been looking into this
new drug on the market, called doravirine” he explains
dryly. I think through the hundreds of papers I read the
past week, I don’t think I know this one. All the drugs
sound the same and have lists of side effects the length
of my arm. Without checking to see if I’m following, he
continues: “It’s a reverse transcriptase inhibitor, I think
we should add it to your treatment regimen.” Another
drug. I already spend half my day taking my current
cocktail of pills, what’s one more? Reverse transcriptase,
I think I remember reading something about that.
It messes with the virus making copies of itself, or
something like that. I think I was on coffee number 10
during that paper. I dread to think about taking another
pill, but everything online says that combination therapy
is the best way to beat HIV. What I hadn’t realised was
that some of the viruses had picked up resistance to some
of the drugs, so using a variety gives you the best chance
of winning. I don’t see how it could make me feel much
worse, so I take the prescription and try to ignore the
doctor’s empty sympathy. After an evening of scouring
the internet for miracle cures, I take my mountain of
pills and try to catch some sleep.
I don’t understand. This always works. I unpack, and the enzyme starts copying. This is a problem. The cell is full of nasty enzymes called nucleases. They patrol the cell and chew up any DNA or RNA that is out of place, and right now I’m seriously out of place. I don’t have my protective coat anymore and there’s no going back now that I’m inside, I’m a sitting duck here. I seriously need my RT to start working before… oh no, not like this.

Right on schedule, a nuclease is heading for me. I give up on the RT, turn tail and run—but it’s no use. It’s faster and I have nowhere to run. It grabs on to the end of my RNA and starts tearing it apart piece by piece. I’ve failed. It’s over.

Today the lights make everything brighter. I don’t mind the crying kids or the sneezing pensioners. This time the doctor doesn’t have to ask how I feel, I’m a changed person and we both know it. “Your viral load is down which means you’re fighting off the virus. It’s not a cure, but you’re on the right track.” He says smiling. I think this might be the first time I’ve seen him smile. I know I’m not cured. I still feel sick; the drugs make sure of that. But for the first time in months I can eat and sleep. I can go to work, see my friends, do my hobbies. I’m still fighting, but it’s different now. I have my life back.

Meanwhile, in a cell not so far away...

Main image: Doravirine
HIV drug molecule (non-nucleoside reverse transcriptase inhibitor), 3D render.

Further reading