



Mandarin orange juice

'Sammy will die, won't she, auntie?' I only hate three things in life: nylon stockings, mandarin orange juice and dead-end streets. Just like the one Daniel's question had just cornered me in. As a doctor, I possess a pretty good repertoire of easy way-outs from such situations; standard sentences with different degrees of reassurance according to the gravity of the disease and to what patients need to be told. I kept staring for a few moments at the white building of the Children's Hospital; Daniel had just been spending the last three hours in a sterile room, wrapped up in a stifle suit at his 11-year-old sister's bedside. That sunny girl always peeving him was now but a bony body slowly withering away. When I turned and looked at my nephew again, sit in the car with its seat belt diligently fasten and his eyes eager for truth, I knew this time I couldn't sneak off:

'Probably yes, she'll die'. Daniel's lips just trembled 'I understood when Dad phoned you to come and get me' For a long time the only sound in the car was the hum of the traffic.

Daniel's apparent peacefulness was quite frightening; I swallowed the lump in my throat and started to speak: 'Sammy has a cancer, precisely a leukaemia. It's a very serious disease and...' but words died away: how to explain to a 7-year-old boy that his sister belongs to a little percentage of cases that doesn't recover? Daniel was still thoughtful:

'Alex got chickenpox from David at school; will I get cancer from Sammy and die too?'

'No Daniel, cancer is not contagious; it raises inside our body. Some cells become injured and in time make the whole organism to get ill. Do you know what a cell is?'

Daniel nodded in the rearview mirror: 'Our body works like an anthill; loads of specialized ants, the cells, cooperate together to run it'. Daniel's metaphor, though scientifically not very orthodox but undoubtedly meaningful, succeeded even in ripping me off a weak smile 'And like every proper anthill, it flourishes only if all its cell-ants carry out their tasks correctly. Every single cell is equipped within its nucleus with a huge handbook where it's elucidated how the whole organism works'

'That's the DNA' 'Exactly Daniel. DNA is divided into 46 big volumes called Chromosomes, which in turn are composed by thousands of chapters, the Genes. Every gene tells a story about how to build up different proteins, which are responsible for all cell duties and survival' 'So DNA's like an encyclopedia, but priceless' I smiled again; 'Yeah, DNANcyclopaedia'. 'What does DNA deal with Sammy's illness, anyway?' The

queue of vehicles moved on as the traffic-light turned green, and so did I: 'Sammy's pathology is a lymphoma; one of her immune cells, a lymphocyte, mixed up by mistake two volumes of DNA; a fragment of chromosome 14 ended up on chromosome 8 and vice versa. The resulting handbook was faulty and so the lymphocyte, instead of building up antibodies to fight microbes, had new instructions to produce huge amounts of the protein c-myc'. 'But how could a single mistake drive Sammy ill?' Daniel sounded skeptical. I sighed: 'C-myc is a transcription factor. They are a sort of timed bookmarks cells use to read the right pages of DNAncyclopaedia only when they are supposed to. C-Myc, in particular, decodes some of the instructions involved in cellular proliferation; if there are abnormally high levels of it in the cell, it starts to divide itself uncontrollably, and that's cancer' 'I still can't see how one error out of thousands of instructions can be so devastating' 'You are right Daniel, at the beginning it's not. But cells must copy all their DNAncyclopedia before dividing, and the ones with high c-myc levels are prone to a more frequent and faster proliferation. Now try and think; what happens when you copy your homework hurriedly?' 'I make spelling mistakes' he admitted. 'And the same happens to cancerous cells; the more and faster they divide without control the more transcriptional mistakes, or mutations, they make in their genes; finally they cease to do their duty, become anarchists and invade other districts of the organism' 'My teacher always underlines mistakes with her red pen to make us to correct them. Is there anyone like her for the cells?' asked Daniel, with a bit of envy.

'Sure, there are highly specialized enzymes. Some of them work as proof-readers, meticulously checking the copying of DNA and editing it in real time if they spot a single mistake. Others are sort of librarians, who supervise the opening and closing of the DNA book, the integrity of chromosomes and the order of genes in them. But you see Daniel, DNAncyclopeadia is actually more like an immense busy library, with thousands of proteins working there every moment in incredibly complex interconnections; sometimes something may go wrong'. I had just turned in my street when Daniel burst out; 'But you're a doctor; didn't you give Sammy a drug?' My heart sank; 'We tried everything we could but, as I'm sure you've understood by now, cancer is such a complex pathology that not always therapies work; Medicine and Science are powerful, but not infallible '. I parked the car in front of my block. Daniel was quiet all the way up to my flat. Finally, while I was rummaging in my bag for the keys, his eyes down on the floor, he whispered: 'Auntie, why has all this happened just to my sister and not to someone else?' My mouth was suddenly full of a bitter, sickly sweet taste, like mandarin orange juice. Still in the

dark landing, there were no more a 38-year-old doctor and a 7-year-old child, but only two human beings full of sorrow and impotent against too big events. 'I am really sorry, but I have no answer to this'.

And only then Daniel began to cry.