

## SCIENCE: ADDING IMAGINATION TO KNOWLEDGE

### The Good, the Bad and the Cancerous

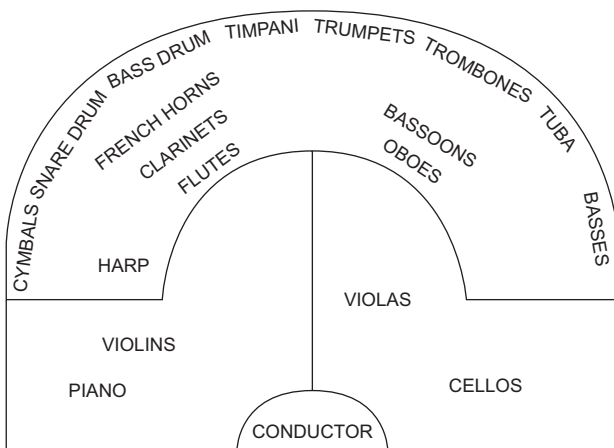
It was early at night and I was reading a very interesting book: "The Black Swan. The Impact of the Highly Improbable", by Nassim Nicholas Taleb, Random House, Inc. (eds), New York, USA, 2007, when a friend called me to inform me that another friend (not really too much older than us) had died from prostate cancer. He was quite terrified, our friend died from cancer!

My immediate reaction was to wonder: did he die from "natural causes" or it was a black swan?

"A black swan is a highly improbable event with three characteristics: it is unpredictable; it carries a massive impact; and, after the fact, we concord an explanation that makes it appear less random, and more predictable, than it was".

When I was a medical student, cancer was defined as a procedure of cell proliferation with four characteristics: atypical-anarchical-unlimited-pointless. But at that time we were developing epistemic arrogance. Since then, we have gathered too much information: too bad for knowledge?

I turned on my CD- player and started listening to Bach's symphony Op. 6 No. 6 in G minor (total time of 13 minutes and 7 seconds, as performed by Hannover Band, directed by Anthony Halstead). I closed my eyes to enter the virtual reality, sitting in front of the orchestra:



Probing a little deeper into the language of the music, I realized that, instead of tolerating noise I was

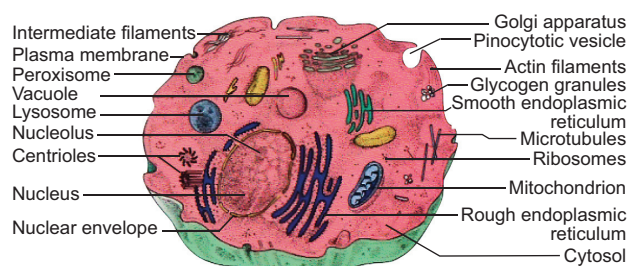
enjoying music because of the organization of sounds. The difference relayed on the way sounds talked to each other: long or short, loud or soft, fast or slow. The instruments and the musicians: How do musicians talk to each other?

The music invades our ears in and up to our cerebral centers. What do we recognize? And how does each of us react? How does music alter our mindset?

Eventually, we applaud the orchestra for its performance. We recognize the excellence of the conductor.

The conductor! He orchestrates all. In the way, that we, the audience, receive the final outcome as melody. Yes. They can be many conductors. And every conductor has a list of musical pieces he conducts: symphonies, concerts, operas, musicals, sonatas, film soundtracks, and so on, written by different composers. He selects and coordinates the musical instruments and the musicians. He presents the soloists.

Let's assume that a cell is an orchestra.



The genes, their expression products, the growth factors, the cytokines, the signaling pathways, the proteins, the lipids, the carbohydrates, the minerals, the nucleus, the cytoplasm and its components, the cell membrane; all these are fine tuned instruments. Arranged and performing in a specific order. Activators, modulators, inhibitors, effectors. Our homeostasis is a musical composition. The orchestra is in us. And we are able to shift ourselves to be the audience too.

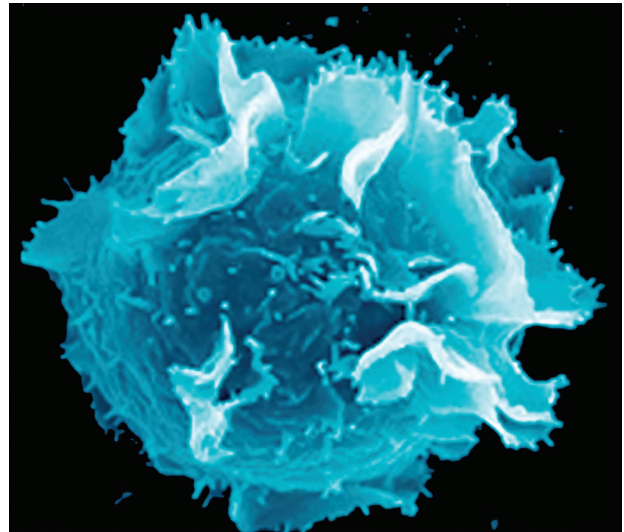
"Humans are hardwired to learn specifics when we should be focused on generalities. We concentrate on things we already know and time and time again fail to take into consideration what we don't know. We are

too vulnerable to the impulse to simplicity, narrate, and categorize, and not open enough to rewarding those who can imagine the Impossible”, Taleb states in his analysis of the “highly improbable”.

The cancer orchestra is the same orchestra, as conducted by a different conductor. Can we listen to the same musical piece as conducted by different conductors simultaneously? No? I agree. Too confusing. Thus, it must be the *same* conductor, conducting the *same* composition with the *same* orchestra. In a different mode. He rearranges the instruments, he changes the tones and the rhythms.

Any suggestions for candidate conductors? Understanding that the risk of a black swan might be invisible being too obvious, I, deliberately, place the **mast cell** in the podium: **protumoral** and **antitumoral**. Mast cells are evolutionarily ancient and abundant in physiological functions, allergic reactions and cancer transformation, growth, infiltration and invasion.

Go now to the third paragraph of this assay. Read it and then ask yourself: Is it probable that the mast cell is a black swan?



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