

# From Yac-1, Back to Square One

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Emergencies have been necessary to progress. It was hunger that drove us to exploration and it is the lack of development that has taught us the value of self-reliance and research. The world has moved from the wire to the wireless, the visible to the invisible and a great deal can be done today which was once thought impossible.

Being one of the supposedly “blessed species”, i.e., medical students, I decided to embark upon a venture of my own. A journey into the unknown and uncharted realm of scientific research, with the aim of enriching myself with experience and living up to the expectations of my parents and teachers. I decided to utilize my summer vacations for exactly this purpose.

The project’s objective was to “determine the immuno-modulating effects of *Nigella saliva* seeds”. My aim was to find a revolutionary new treatment for the immuno-compromised. My project would be a novel achievement in science. I would be famous, hailed all over the world, a modern day Messiah. There was nothing stopping me now. And so I dreamt on.

However, three months down the road my concept of research had changed. After months of continuous and painstaking bench-work, in the basic health sciences research lab, I realized that research is not always about winning the Nobel Prize, getting your paper published in a renowned journal, or boosting up your CV! For in my case, research consisted of weighing live mice (which would scare the living daylights out of any female), giving these murines intra-peritoneal injections on a daily basis (which meant I was at it on weekends too) and to top it all, killing them by cervical dislocation after they had served my purpose. Quite an experience, I assure you!

Another aspect of the project was to prepare an extract of *Nigella sativa* seeds. Now this may sound “high-tech”, but wait till you read what it really meant. How about endless hours of removing impurities from the seeds and then manually crushing them with a mortar and pestle (and they say research has advanced, whereas I was still using utensils from the Stone Age!). The powder was then mixed with distilled water, using a high speed vortex and multi-mixer and centrifuged at 3000 RPM. The supernatant was then collected and refrigerated in sterile plastic tubes. And this was just the beginning

The research was initially directed towards investigating the effects of the *iv. saliva* seeds, on the activity of natural killer cell against tumour cells - the Yac-1 cell line. The lysis or death of the Yac-1 cells was to be measured by a radioisotope release assay. So far so good. But during implementation of the research protocol, a train of difficulties cropped up, one after the other. Several different approaches’ and models were experimented with for an optimal experimental design. These included methods as diverse as spectrophotometry, weighing haemopoietic organs and macrophage phagocytosis analysis. All failed to provide conclusive results. This was just the tip of the iceberg. One fine day, we found, to our honor, that the Yac- 1 cell line was contaminated with *Candida*! Maintaining the Yac-1 cell line was easier said than done. Now, it was back to square one!

However, the research continued. Looking back today, I feel that my elective period was an eye-opener for me. The world of research, which I had perceived to consist of glory, fame and going to Karolinska for the Nobel Prize, turned out to be absolutely contrary to my expectations. In reality it is all about perseverance, patience and tenacity to achieve ‘one’s goals.

As health professionals, we face tremendous problems in a setting of extremely constrained resources. If you ask our generation how they envision the world in fifty years, or how they want their life to be five years from now, the answers are often preceded by “provided there is still a world” and “given that I am still alive”. These pessimistic views of tomorrow, can only be brightened by the light of research,

so that generations from now, we can claim to be better equipped to meet the challenges of this ever changing world.

No matter how advanced the quest for knowledge may sound, I believe Feynman's philosophy of "looking at the world" embodies the essence of research - "learn by trying to understand simple things - always honestly and directly. What keeps the clouds up, why can't I see the stars in the daytime, why do colours appear in oily water, what makes the lines on the surface of water being poured from a pitcher, why does the hanging lamp swing back and forth? Then when you have learned what an "explanation" really is, you can go onto more subtle questions".

So we should keep our latent curiosity alive; and it is its constant stimulation that will propel us forward to discover and progress.