

Patient Zero

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As I lie here staring at the ceiling, I realize that this is my fate. You might ask why is this my fate. Why can I not change my fate? For you see I am patient zero. What lies beyond the walls of this hospital is my creation, my inheritance and that of my loved ones. Did I mean to create such chaos? I am a good person that cares about others and would never knowingly impose my choice on them. So how did this happen? How did a pandemic affecting 300 million people begin by one simple action, my action? To understand what I have done you need to get to know me. My name is Nathan Miles and I am/was a biomedical engineer. I am twenty-eight years old and been told I am handsome. Of course, in the end none of this matter. I am slim built yet appear strong. I am six-foot 2inches tall with dark brown hair and green eyes. I have been told I have a charismatic smile and indeed I was always smiling. And why not, I had a charmed childhood. Loving parents, devoted siblings were my staple. I was not as yet married but I was married to my career. I enjoyed many friends, most of which are now gone, but I digress. Education came to me naturally and I excelled through the years. Early on I decided I loved science and wished to make a difference. And of course, I did. I chose a career in Biomedical Engineering. The ability to create new tools to help those in the frontlines, the field, was my goal. A medic trying to save a life was my focus. The idea of working with custom designed viral agents was far from my intent. But I am getting ahead of my story. Where was I, oh yes, a young scientist enjoying a wonderful balance of life's offerings. No serious relationships as yet but maybe someday. I thought of maybe marriage, maybe a family, but I have my whole life ahead of me. So much time to experience it all. Someone wise once told me to live my life to the fullest each and every day. Now I know how truly wise this man

was. If I had to live my life all over again would I make the same choices, same decisions? I do not regret my choices, that is a given. Yet knowing another human being on a level of total understanding, total intimacy was far from my choice. So, I completed my postdoctoral work at the prestigious Harvard University Institute for Bioengineering under the tutelage of Dr. Maxwell Tuttle, a world-renowned bioengineer. Although I was at the institute for only two years my work was well received. I was offered a permanent position at the institute. I had the privilege of working with some of the brightest and dedicated young minds. Our 1st project as a team was to work with microscopic robots which we called nanonytes. At this time nanorobotics was an emerging technology. Dr. Tuttle felt that we needed as a team to design, create, and build robots whose components were of the scale of a nanometer. These molecular components could have endless possibilities, but our focus was the human body. Imagine robots moving through the body and repairing all that has gone wrong from injury or disease. We were thrilled and honored to be one of the early adopters of this technology to help mankind, or so we thought. As any engineer we were given a problem to solve and we would brainstorm solutions. I enjoyed the latter sessions. Sometimes our solutions needed reevaluation, but it allowed us to be creative with a new solution. Dr. Tuttle encourage such “outside the box” thinking. During my time at the institute we created many new tools for our medical personnel both in the field and in hospitals worldwide. Soon enough our team became known as the A-Team. We had many accomplishments with some minor failures along the way. Our goal was always foremost in our minds – to provide technological solutions for our field medical personnel. The key, all solutions needed to be portable and reliable. Portable and stable for our medics in war torn makeshift hospitals. Tiny to be used by our tiniest of humans, our infants and our children. In what may have been our most impressive creation as yet we engineered a set of optical tweezers, so to speak, that could place a nano-scale based robot

or nanobots inside a human cell. Initially the work of this robot was to probe and report that status of this individual human cell. It was only a reporter. Yet with time we programmed this tiny robot to track and repair cellular damage. Our first task was to eliminate cancer. We began by examining cells that developed into tumors and the blood vessels that fed them. What if we could use our robots to block the blood vessels feeding these tumors? Could we destroy these tumors before they became destructive? The answer was unequivocal, yes. Our field became explosive overnight. The potential for success was imminent. Once functional, these robots interacted with biological cells, giving them medical potential. They could manipulate cells in specific alignments, move cells to other locations, or deliver medicine to those cells. Those capabilities became useful in personalized medicine but more so in the treatment of cancer. Our nanobots completely eliminated chemotherapy. Cancer was being eradicated right before our eyes. Our hard work was followed by many success stories. We had attempted and accomplished more than we could have ever imagine. Yet it was not enough. True research goes beyond today towards the promises of tomorrow. Could we do more? Could we go further and dig down to the nuclear level and enter the nucleus. Could we repair the DNA itself and prevent and/or alleviate chronic genetic diseases? The promise of a future for mankind with no disease was so alluring for us and for many research teams worldwide. We became a household name, and all were committed to our future work. Grant after grant came pouring in to continue our work. We were no longer a small lone research team isolated in one corner of the world, but the savior of humanity. The next decade was dedicated to successful DNA manipulation. Our robots could now enter the cell without the need for those tweezers. Our technology advances allowed us to place a million microscopic robots on a four-inch silicon wafer in just a few weeks. These tiny robots were significantly smaller than the width of a human hair (in the order of a DNA strand of 2nm wide) that was equipped with a brain, sensors, clocks, and

controllers. They were virtually independent self-aware and self-functioning devices. These devices were able to rewrite their own code to accommodate their environment and enhance their outcome. It was the latter accomplishment which led to a new generation of subatomic robots. Their basic programming enhanced by the robot itself. Alzheimer's and Parkinson's can be treated by the targeted cell transport for vascular repair or by regenerating or repairing impaired neural pathways. Our nanobots were transporters, delivering modified cells and submicron-sized surgical tools conducting targeted in-vivo vascular repairs, with micrometer precision and reaching those places where surgical operations were not an option. Alzheimer's and Parkinson's was treated by the targeted cell transport for vascular repair and by regenerating and/or repairing impaired neural pathways. In addition, through this process we reversed Alzheimer's disease by replacing lost cells in a brain.

Further we had created a collective to allow the robots to work cooperatively to accomplish their task. We developed the frameworks that were required to enable concurrent collective intelligence. We had much success in applying the core technologies that made it possible for these robots to work together seamlessly. These technologies allowed a single robot to share information with other robots, to share information with their human programmers, to learn and understand what the human intent was as they worked within the human body. Collective intelligence and coordinated, multi robot systems were able to work together to achieve things which each robot could not achieve on its own. Eventually these robotics systems did not need human interaction. They could assess and determine the best course of action as a collective. The use of collective nanobots became the norm in all human medical treatment. Even for our furry friends there was a solution. Human life was extended, and the quality of human life was a given. Without disease or natural death, humans far exceeded lifespans of the past. Even accidents were repairable. There

was no termination date. Most did not believe this reality at first but as they saw the elderly become indistinguishable from the youth, belief set in. We had inadvertently found the “Fountain of Youth” and the cure for all humanity’s ills. The world was in our debt and we accepted this debt with much pride. Then one day, something changed. It was a subtle change at first. It appeared as if a nanobot or two rejected its basic programming. We were called into the medical facility because of our expertise. Dr. Tuttle and I assessed the issue. The problem appeared on the surface to be repaired. Yet shortly thereafter other nanobots began to break down. The medical facility did not have the resources to attend to those coming to its doors. Sick humans most of which were on the brink of death, was an image of the past, not the present. The time between visible symptoms and death was seventy –two hours. In that time many were becoming infected. The infection began to spread from city to city and country to country. The infection became a worldwide epidemic in a matter of weeks. We tried all we knew to find the source and yet it evaded us. Eventually we realized that the infection began with me. I was patient zero. But it was too late. It was nanobots that altered their task in my human body, yet initially I appeared to be quite well. My body decided to treat the nanobots as virial agents to be eliminated by overproducing Cytotoxic or “killer” T-cells. The abnormal immune process that is likely responsible for the subsequent series of events appears to involve selective activation of helper T cells and killer T cells, with a corresponding decrease in regulatory T cells. As the killer T-cells began their attack, my nanobots fought back with a vengeance. To prevent further killer T-cell attacks, the nanobots altered their mission. So nanobots, instead of repairing their human counterparts began to alter their mission. The culprit, an unknown virus that attacked cells on the nuclear level by altering the DNA. The alteration of human DNA made humans susceptible to all known infections of the past. The DNA was altered

to mass produce modified T-cells that could not be repaired. These modified T-cells, not unlike Regulatory T cells, functioned in an opposite manner, they turned off the immune response.

Our nanobots have (borrowed from the bees) the capabilities to communicate through vibrations. All instructions are shared simultaneously, even the instructions in error. Humanity's first form of defense was now at risk. Termination of humanity had begun. The symptoms at first presented themselves as flu-like symptoms. An upper respiratory infection. The cold that just would not go away. Yet with all such conditions gone, a simple cold or allergy was highly visible. It was easy to detect the infected and worldwide panic ensued. Best of friends became enemies and massive fear continued to grow. The death rate would increase each day exponentially as more and more patients flooded the few medical facilities that still remained. We could not have anticipated such an infection on such a grand scale. We were defenseless.

All that we knew began to change, town after town, city after city, country after country began to impose a quarantine in an effort to contain the virus which was now highly communicative. Simply breathing near an infected individual was enough. It was airborne and death was inevitable. If you had the unfortunate opportunity to catch this virus you simply died within 72 hours of showing symptoms of Acute Respiratory Distress Syndrome or ARDS. Yet you could incubate this virus for 12 days before showing symptoms. It was this long incubation time that made this virus so infectious and communicable. It became a pandemic with no selection process, world leaders to homeless men/women on the streets of a city, all were affected. Ages to were independent. A one-day infant had just as much chance upon exposure to catch the virus as did a 100-year-old.

In the early days of the virus, there were those that were convince it was a hoax from ordinary citizens to government leaders, presidents and prime ministers alike. It was seen as something created by the media, false news if you wish, to get better/higher ratings. This disbelief led to the

delay in instituting country wide containment/quarantine which allowed the virus to spread at an alarming rate. The worse contender was the US, my country. Our current president often called it a hoax until he was pressured by a bipartisan intervention to respond responsibly to this crisis. By then there were close to 1.5 million known infected with 1.2 million reported deaths, or 83% death rate, including three members of the presidential family. The strain on healthcare facilities was beyond description. Healthcare personnel worked in 24 hours shifts over multiple days. Many would live on the hospital premises away from their families to prevent the spread of this infection to their loved ones. During their off hours, which were few and far between, they wrote their last will and testament for they knew they would die. Makeshift hospitals to provide beds were continuously built. Yet could not keep up with the need. Private companies geared up to provide respirators and medical supplies, but they too could not keep up with the demand. Many shut their doors as their management and employees succumb to the virus. Small businesses and corporations failed, they lost employees, managers, CEOs, and patrons. The economy underwent a nosedive as the Dow decreased every day in large significant jumps. Trading came to a standstill. The worldwide financial institutions closed their doors. This virus attacked the core of all financial and healthcare institutions. College, schools closed as an effort in containment early on. But with time children were sent home to spend their final days with their loved ones. Yet with all this around us, there was hope. Hope that we will find a cure in time, hope that some of humanity would survive and rebuild. As the news became desolate each and every day, one day, weeks into the pandemic I saw that ray of hope. It was a city within a country where there were over 10 million deaths. The ones that were ill but not as yet succumb to the disease stood on their balconies in each and every one-off it cities. A single man, an opera singer, began to sing with his young son in his arms. A second voice followed, a third voice, until the entire quarantined quadrant joined in song.

The singing lasted for hours into the night as more and more joined in. It was an image of hope, a hope that humanity would survive. I knew then what I must do.

I was the creator of these nanobots, so now I must become their destroyer or at least their survivor. But how could this be done in the time I had left. How could I change what has happened and is yet to happen? But I had an idea. “Give the hope of humanity to my nanobots. Give them the task to save humanity in their basic programming”. All this time our focus became to attack the virus and our nanobots stayed steadfast to their task of protecting the virus. Give them instead the task to come up with the cure to eradicate the virus themselves. I had very little time, but I began to reprogram my tiny creations and began injection into test subjects that wish to help. Failures were many within the first 24 hours. The virus continued its determined course. Although, Dr. Tuttle was long gone during the first wave of this pandemic, his daughter continued his work. She has just contracted the virus and was anxious to help. And so, she became my success and the world’s savior. Her name is Cassie Tuttle, a bioengineer not unlike myself and a beautiful soul inside and out. I knew her for all my years with Dr. Tuttle and never really saw her. Yet at this moment I knew true love. I did not wish to lose her, but she insisted to be my test subject. The process of reprogramming was long and tedious but with her by my side I knew I was not alone and could do this. It was 36 hours later, and my mental capacity was slowing down as my lungs began to betray me.

It was the 40th hour and I knew that we had something that should work. So I injected Cassie and myself. We held hands and hugged for the first time. Since the virus began hugs were not permitted. It felt so good and so right. Twelve hours went by and no detectable changes were seen. On the 15th hour I began to feel something different. My temperature seemed to go down. Cassie quickly measured it as she did hers. Yes, it went down, not only a few degrees, but back to normal.

Could this have truly worked? Are our nanobots repairing the body and eradicating the virus they had created? We immediately contacted the CDC and proposed the format for the injectable. Over the next few hours all our symptoms became a memory. Mass production of our new nanobots became the focus of every country. Within the next few weeks, the virus was gone and humanity could thrive again. All that were sick began to recover. We lost 300 million lives worldwide but saved the future of mankind.

Did we as a people learn anything from the almost eradication of mankind?

I hope so.