

Curing Cancer with Telomerase
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Cancer is a major problem facing the world today. Almost everyone can say that they know someone affected by cancer either directly or indirectly. Cancer cells are cells that grow at an abnormal rate. Every person has some type of cancerous cells in their body at one point in their life, the question is whether the cells themselves abnormal. In other words do they have a mutation that is causing the cell to do harm to that person? The idea behind a telomerase treatment is relatively new and not yet able to be implemented.

To understand this type of treatment you must first understand a few simple things about how DNA is replicated. First an enzyme called helicase “unwinds” the double helix, and then another enzyme DNA polymerase binds loose nucleotides to the DNA strand. The DNA polymerase only works from the 5’ to the 3’ end. Because of this there is a small part of the DNA strand left that does not get replicated. This part of the DNA strand is called the Telomere. Telomeres are in all cells; they are on each end of the DNA strand to protect it from the replication process. The downfall is that after each replication a piece of the telomere is “chopped off”. Once this process gets far enough along in the cells life, the replication process starts to take the code that the cell needs to perform its functions. When this happens the cell dies. The telomere is very important in the fight against cancer for a few different reasons. Researchers noticed that the cancer cells did not lose their telomere at all, which is partly why they grow so fast. As the cell

gets “older” and the ends of the telomere get closer to the code the cell needs to function, the process of replication becomes slower due to this and the cell eventually dies. If cancer cells never lose their telomere not only will they grow rapidly they will effectively never die due to age. So the next question is what causes the cancer cells not to “cut off” their telomere? The answer another enzyme, more specifically a ribonucleoprotein enzyme called Telomerase; Telomerase is part of a class of enzymes known as reverse transcriptase, which use RNA as a template for DNA creation. This enzyme rebuilds the telomere infinitely so a cell could live forever, which are what cancer cells do. Over ninety percent of cancer cells have the telomerase enzyme. The idea behind this treatment is to inhibit the enzyme and stop the growth of the cancer cell. Study has shown that telomerase need another molecule hTERT as a catalyst to start the process, what researchers are attempting to do is find a way to stop the hTERT from catalyzing the reaction. Research is only in its preliminary steps; as of right now the treatment is only hypothetical at best. If this treatment is mastered then most forms of cancer will be able to be treated quickly and without the harmful effects of radiation and surgery to the patient.

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