

## Hashimoto's Thyroiditis

When I was 14 I was diagnosed with Hashimoto's Thyroiditis, an autoimmune disease which results in the thyroid being unable to produce the hormone which regulates metabolism. I was placed on levothyroxine, a synthetic version of the hormone my thyroid was no longer making. Within a few months I had more energy, I was happier, my became thick again, I wasn't always cold anymore, and it was all thanks to recombinant DNA.

Levothyroxine is produced by taking the gene responsible for the production of thyroid hormone and inserting into a plasmid by utilizing restriction enzymes which cut the double stranded DNA of the plasmid leaving "sticky ends" (an overhanging portion of the DNA which binds to the gene being inserted). The plasmid is then inserted into another organism, typically E. coli, and then the gene is expressed by the organism causing it to secrete the hormone. It can then be purified and made into the tablet which I take everyday.

While this medication treats my symptoms it does not cure my condition or fix the underlying cause. I want to work to develop better treatments for autoimmune diseases, because right now there are very limited effective methods. Most treat just the symptoms but do nothing to correct the underlying cause. Even in cases where the actual immune response is addressed rather than just its effects immune-suppressants are used which open the patient up to a massive number of infections and complications. More research into the causes of autoimmune disease, both genetic and environmental, needs to be conducted to improve quality of life for people living with these conditions. Having an autoimmune disease raises your chances of getting certain cancers, and makes the likelihood of developing additional autoimmune disease drastically higher meaning a minor disease can develop a fatal autoimmune condition, which is why we need more research of conditions that are not life threatening. Biomedical research has improved my life so much, but it cannot cure my conditions. I hope to one day be able to change that for myself and others with similar disorders.

## References

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