T helper 17 cell activation in response to *Candida albicans* in autoimmune polyendocrine syndrome type one

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Autoimmune diseases are caused by immune responses that destroy self tissues and cells. Understanding the mechanism of autoimmune disorders is the key to development of new therapies that will help to reduce the damage to the body during the disease process and improve patients' quality of life.

Autoimmune polyendocrine syndrome type 1 (APS-1) is a genetic disease. Mutation(s) in a gene affecting the development of immune cells such as T cells must be inherited from both parents in order for disease to occur. APS-1 is a comparatively rare disorder, but persons that have been diagnosed with it suffer from several autoimmune disorders and chronic infection of *Candida albicans* already early in life. Currently, there is no treatment available against APS-1, and antifungal drugs must be used throughout the whole life, which cause additional problems in the form of drug-resistant infections.

The function of cytokines, which are proteins produced by many immune cells, is to help to mount a suitable immune response towards pathogens. However, cytokines may worsen autoimmune diseases. Some cytokines are produced in much larger amounts in APS-1 patients, compared to healthy individuals, by cells in response to *C. albicans* stimulation. T cells producing the cytokine interleukin-17 are thought to drive autoimmune disease and are also suspected to play a role in supporting chronic Candida infections. But does interleukin-17 play the same role in healthy humans and how is it controlled? Through blocking two cytokines that are thought to promote the production of interlekin-17 and measuring the differences in the cytokine expression, I tried to improve the understanding of the mechanisms that make APS-1 patients more susceptible to chronic Candida infections when compared to healthy individuals.

My result confirms the previous findings that interleukin-17A is produced in much larger amounts in APS-1 patients than in healthy individuals. However, the blocking of the two candidate proteins (interleukin-6 and interleukin-1 β) did not change this pattern. Future studies could aim to block receptors for these proteins instead of proteins themselves.

It is never a trivial task to work with human material when trying to dissect molecular and cellular interactions, because many factors are still unknown and cannot be controlled. But because the level of interleukin-17 is so much higher in APS-1 patients compared to healthy controls, further studies of this cytokine and its regulation in the human body can lead to a discovery of therapeutic strategies for this disorder.

Degree project in biology 45 hp, HT 2009 - VT 2010
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