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Finding that could shed light on 'golden staph,' candida and allergies

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Recent scientific findings explain why patients with a rare immunodeficiency disorder are unusually susceptible to certain common infections. By revealing the exact molecular mechanisms involved, they also give us clues as to why some 'healthy' people are more prone to these infections than others, and suggest potential treatments.

People with Hyper IgE Syndrome, or 'Job's Syndrome', suffer from devastating complications of skin, gut and lung infections caused by candida albicans and Staphylococcus aureus. We all have these fungi and bacteria on our skin, but healthy immune systems largely keep them at bay.

Late last year, research groups in Japan, Europe and the United States discovered that Hyper IgE Syndrome is caused by a mutation in the Stat3 gene. Although the gene was identified, the mechanisms leading to illness were not determined.

The Stat3 finding led Scientists at Sydney's Garvan Institute for Medical Research and Canberra's John Curtin School of Medical Research to speculate that patients with Job's syndrome lack a subset of immune cells known as Th17 cells.

Laboratory tests conducted by Dr Cindy Ma, a postdoctoral researcher at Garvan, and Drs Gary Chew and Nicholas Simpson at the John Curtin School confirmed the hypothesis, leading to publication of a paper online today in the Journal of Experimental Medicine.

"We've established that patients with Hyper IgE Syndrome are deficient in a particular subset of immune cells that are important in protecting the normal population against candidal and staphylococcal infections," said Dr Stuart Tangye, head of Garvan's Immunobiology research group. "Now that we understand the mechanisms behind the illness, it should not take long to develop a treatment. There is also the prospect of treating other diseases which cause susceptibility to candida."

Dr Matthew Cook, Immunologist at Canberra Hospital, medical researcher at John Curtin and together with Stuart Tangye, co-senior author on the project, has much first-hand experience with Hyper IgE syndrome. Of the five patients examined in this study, three came from his clinic. "While Job's syndrome is a very rare disease – roughly one in 500,000 – for individuals affected, the consequences are devastating, and until now we have had very little idea about how to manage the complications. Our findings offer the potential of rational and effective treatment in the future."

"People with Job's syndrome suffer from a narrow spectrum of infections that can be life-threatening, including lung infections that result in chronic lung damage. They are also susceptible to skeletal disorders including osteoporosis and frequent bone fractures. There are currently about 12 people diagnosed with the syndrome in Australia and around 80 being treated by the National Institutes of Health in the U.S."

"Since Job's syndrome is characterised by very high levels of IgE, the antibodies crucial for allergic responses, understanding the connection between the absence of Th17 immune cells and presence of IgE is a high priority for future research that might shed light on other common disorders."

Source: Research Australia