Lupus patients exhibit altered cell proteins, a discovery with potential implications for diagnostics

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Autoimmune diseases such as lupus—in which the body attacks its own cells and tissues—are on the rise, according to A*STAR's Anna-Marie Fairhurst. Her team is the first to observe that patients with lupus exhibit an increased number of a specific type of protein on the surface of certain white blood cells. This finding may help diagnosticians in detecting the disease, or reveal new avenues of research into its causes.

"Systemic lupus erythematosus, or SLE, is the archetypal autoimmune disease, and affects the whole body," says Fairhurst. Common symptoms include fever, swollen joints, and fatigue, though the exact presentation and severity vary from patient to patient.

Fairhurst's research group, including scientists from the Singapore Immunology Network and the Institute of Molecular and Cell Biology, recently discovered a link between SLE and the increased prevalence of a cell-surface protein that modulates immune responses, called 'Siglec-14.'

The team assessed 39 patients with SLE and found that, compared to a cohort of healthy individuals, the patient group expressed significantly more Siglec-14 proteins on a class of white blood cells called monocytes. SLE disease severity also increased in tandem with the monocyte levels of Siglec-14 among the study group.

Most Siglec proteins are inhibitory, dampening immune responses upon recognizing the body's own molecules. This is thought to be an innate mechanism that prevents the body from attacking itself. Siglec-14, however, differs in that it's an excitatory molecule that stimulates host defenses. "An increased expression of Siglec-14 would create a greater stimulatory signal," says Fairhurst. It's not fully understood how much the increased protein contributes to the disease: "The increase could either amplify inflammation or just be an indicator of disease," says Fairhurst.

In a previous study into Siglec-14 and chronic obstructive pulmonary disease, a gene variation causing the loss of Siglec-14 expression resulted in a reduced risk of inflammatory response that could exacerbate the disease. Fairhurst's results on SLE showed no disparity in SLE disease severity/prevalence between those with, or without, the gene variant.

This paper is the first to explore the relationship between SLE and monocyte Siglec expression, and Fairhurst hopes that other institutions will start to look at the relevance of Siglec proteins to disease: "Every discovery in research is a stepping stone, and since this study is the first of its kind, I'd like other researchers to be able to reproduce these results, and then build on them to find out why this happens, and better understand human disease."

More information: Susannah I. Thornhill et al. Monocyte Siglec-14 expression is upregulated in patients with systemic lupus erythematosus and correlates with lupus disease activity, *Rheumatology* (2017). DOI: 10.1093/rheumatology/kew498

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