Impaired neutrophils in autoimmunity

January 28 2022, by Leigh MacMillan

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Patients with autoimmune diseases such as systemic lupus erythematosus (SLE) have higher blood levels of the protein S100A9, but the source of this protein has not been identified.

Andrew Monteith, Ph.D., Eric Skaar, Ph.D., MPH, and colleagues

reasoned that high S100A9 may reflect increased levels of the protein in neutrophils, where it influences antibacterial activity and could contribute to an increased risk for infection in patients with autoimmune diseases.

The researchers have now demonstrated that neutrophils from SLE patients and in a mouse model of the disease accumulate high levels of S100A9. They showed that increased S100A9 is associated with lower mitochondrial superoxide production and decreased neutrophil extracellular trap formation (antibacterial mechanisms), and with higher susceptibility to Staphylococcus aureus infection. Increasing superoxide production restored antibacterial activity against staph in the mouse SLE model.

The findings, reported in The *Journal of Immunology*, show that accumulation of S100A9 impairs mitochondrial function and antibacterial activity of SLE neutrophils.

More information: Andrew J. Monteith et al, Altered Mitochondrial Homeostasis during Systemic Lupus Erythematosus Impairs Neutrophil Extracellular Trap Formation Rendering Neutrophils Ineffective at Combating Staphylococcus aureus, *The Journal of Immunology* (2021). DOI: 10.4049/jimmunol.2100752

Provided by Vanderbilt University