



Case #587

## **Novel Lupus (SLE) Diagnostic Biomarker and Therapeutic**

Only one new drug has become available over the past 50 years for the estimated 1.5M Americans and 5M people worldwide suffering from systemic lupus erythematosus (SLE), also known as lupus. In addition, SLE is extremely challenging to diagnose, taking an average of 6 years to diagnosis from the first sign of symptoms, delaying critical early treatment.

UVM researchers identified a previous unknown mechanism involved in the SLE immune response that provides both a novel therapeutic target and a new method of diagnosis and stratification of SLE patients. Mitochondrial antiviral signaling protein (MAVS), is activated by oxidative stress and produces stable clusters in the mitochondria of SLE patients, which then leads to the secretion of IFN-1 and pro-inflammatory cytokines. Antioxidant treatment with MytoQ reverses the MAVS clusters and prevents interferon production in mice. A rapid and sensitive test to detect and measure the levels of these MAVS aggregates has been developed using a homo-FRET-linked immunosorbent assay (h-FLISA), which can be used to identify SLE patients for anti-IFN-1 treatment and could also detect other disease specific protein oligomers.

### **Applications:**

- Biomarker for SLE diagnosis and stratification.
- New mechanism and target for SLE treatment.
- Detection of other disease specific protein oligomers.

### **Advantages:**

- Direct biomarker for SLE diagnosis and patient stratification.
- Identifies patients for anti-IFN therapeutic treatment.
- Rapid and quantifiable detection of MAVS and other protein oligomers.
- MAVS aggregates present a direct target of disease manifestation.

### **Intellectual Property and Development Status:**

US Non-provisional Application US20190099470A1

Looking for both licensing and industry partners for development of therapeutics that reverse MAVS clusters and of h-FLISA for diagnosis of SLE and other diseases.

### **References:**

Reactive oxygen species induce virus-independent MAVS oligomerization in systemic lupus erythematosus *Sci Signal*. 2016 Nov 29;9(456)

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