

# Systemic Lupus Erythematosus: An Immunological Mystery

**Systemic lupus erythematosus** (SLE) is a chronic autoimmune disease in which the immune system mistakenly attacks healthy tissue, causing systemic inflammation in tissues and organs across the body.<sup>i,ii</sup>

## The Not-So-Simple Story of SLE

The exact cause of SLE is unknown and is believed to be the result of a combination of **genetics, hormones and environmental exposures**.<sup>v</sup> Disease pathology research has shown that immune dysregulation and loss of recognition of a person's own cells occurs through a complex biological process.

**3.5 million**  
people live with SLE  
around globally<sup>iii,iv</sup>

## Meet the Physiological Players in SLE:

### **BLyS (B lymphocyte stimulator)**

**Normal role:** Cell-signaling molecule, contributes to development and survival of B cells

**Role in SLE:** Binds to B cells, activating them to stimulate autoantibody production<sup>vi</sup>

### **B cells (leukocytes)**

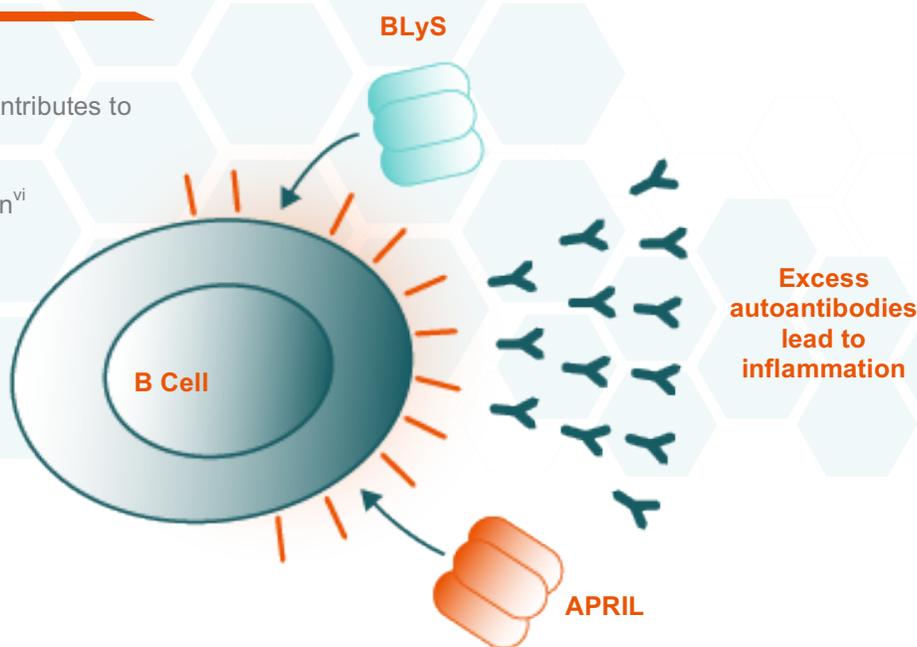
**Normal role:** Produce antibodies against infectious diseases and other pathogens, as part of the immune system

**Role in SLE:** Goes overboard creating autoantibodies that attack a person's own healthy cells are deposited around the body, leading to inflammation

### **APRIL (a proliferation-inducing ligand)**

**Normal role:** Cell-signaling molecule, contributes to development and survival of B cells

**Role in SLE:** Binds to B cells, activating them to stimulate autoantibody production<sup>vi</sup>

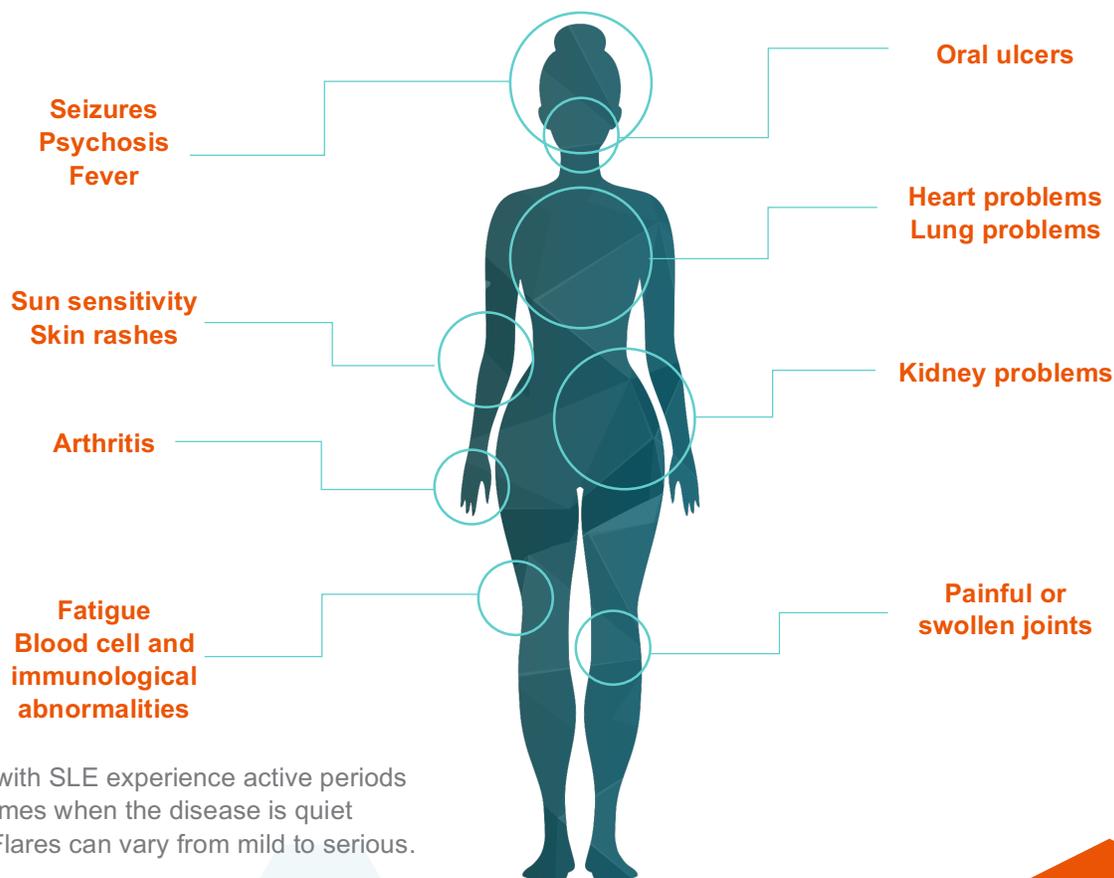


## Future Focus: BLyS and APRIL

Elevated levels of BLyS and APRIL in the blood have been observed in SLE patients. Inhibition of BLyS and APRIL selectively prevents stimulation, still allowing immature B cells—critical for the overall functioning of the immune system—to remain intact.<sup>vi</sup> **Given this role, BLyS and APRIL are promising therapeutic targets.**

## How SLE Affects the Body: Signs & Symptoms

As an autoimmune disease, SLE can affect every part of the body.



Most people with SLE experience active periods (flares) and times when the disease is quiet (remission). Flares can vary from mild to serious.

## Treating SLE: No Easy Path Forward

There is no cure for SLE, but medical treatments and lifestyle changes can help control the condition.<sup>i</sup> However, managing SLE continues to be complicated and mortality rates remain a major concern.<sup>ii</sup> Currently available treatments aim to control symptoms and prevent permanent organ damage. The SLE treatment landscape is desolate—clinical trials focusing on the condition have faced many difficulties.<sup>vii</sup>

In the last 60 years,  
**only one drug**  
**has been**  
**FDA-approved**  
**for SLE<sup>vii</sup>**

## References

- i. US National Library of Medicine. Systemic lupus erythematosus. MedlinePlus. Available at <https://medlineplus.gov/ency/article/000435.htm>.
- ii. Calabrese LH. Treatment of SLE: bridging the gap from clinical trials to the clinic – a meeting report. *Arthritis Research & Therapy*. 2013;15. Available at <https://arthritis-research.biomedcentral.com/articles/10.1186/ar4219>
- iii. Lupus Foundation of American. Lupus Facts and Statistics. 2019. Available at <https://www.lupus.org/resources/lupus-facts-and-statistics>
- iv. Pons-Estel GJ, Alarcón GS, Scofield L, et al. Understanding the epidemiology and progression of systemic lupus erythematosus. *Semin Arthritis Rheum*. 2010;39(4):257-68. doi: 10.1016/j.semarthrit.2008.10.007. Epub 2009 Jan 10.
- v. Moulton, VR, Suarez-Fueyo, A, Meidan, E, et al. Pathogenesis of Human Systemic Lupus Erythematosus: A Cellular Perspective. *Trends Mol Med*. 2017;23\*7): 615-635. doi: 10.1016/j.molmed.2017.05.006.
- vi. Samy, E, Wax, S, Huard, B, et al. Targeting BAFF and APRIL in systemic lupus erythematosus and other antibody-associated diseases. *International Reviews of Immunology*. 2017;36(1):3-19. DOI: 10.1080/08830185.2016.1276903.
- vii. Mahieu MA, Strand V, Simon LS, et al. A critical review of clinical trials in systemic lupus erythematosus. *Lupus*. 2016;25(10):1122-1140. DOI: 10.1177/0961203316652492.