## SSLC

Visualizing Lupus Symptom Clusters Using D3

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Systemic lupus erythematosus (SLE) is a chronic autoimmune illness that can affect nearly any organ in the body and causes a very wide range of symptoms. Although early detection can be critical for a patient's future quality of life, SLE's wide range of symptoms may lead to several misdiagnoses prior to arriving at a lupus diagnosis. One method by which doctors may seek to better understand SLE is by understanding which symptom clusters often occur. A symptom cluster is a concurrent occurrence of two or more symptoms, and these clusters could help doctors, patients, and caregivers better understand how the disease often presents itself.

The objective of this research is to find a method by which those numbers and figures can be visualized in an interactive way, so that people are able to actually interact with data. In this manner, SLE and its symptoms could become easier to understand for both doctors and the general public. If doctors were able to actually look at and interact with a map of symptom clusters, they might be better equipped to identify it in patients even when that diagnosis isn't as obvious. So far, a visualization has been developed using test data. This visualization consists of circular nodes representing symptoms, square nodes representing diseases, and lines that show the connections between the nodes. Users can drag and drop the nodes and it will keep them in place until the user resets the simulation. In the future, actual data will be used.

Byrd writes: "Systemic lupus erythematosus (SLE) is a complex autoimmune disease that is difficult to diagnose and treat due, in-part, to the fact that symptoms associated with SLE often mimic other diseases. Lauren's work has the potential to make a significant contribution to the effort to provide visual representation of symptoms that manifest in SLE and other diseases."
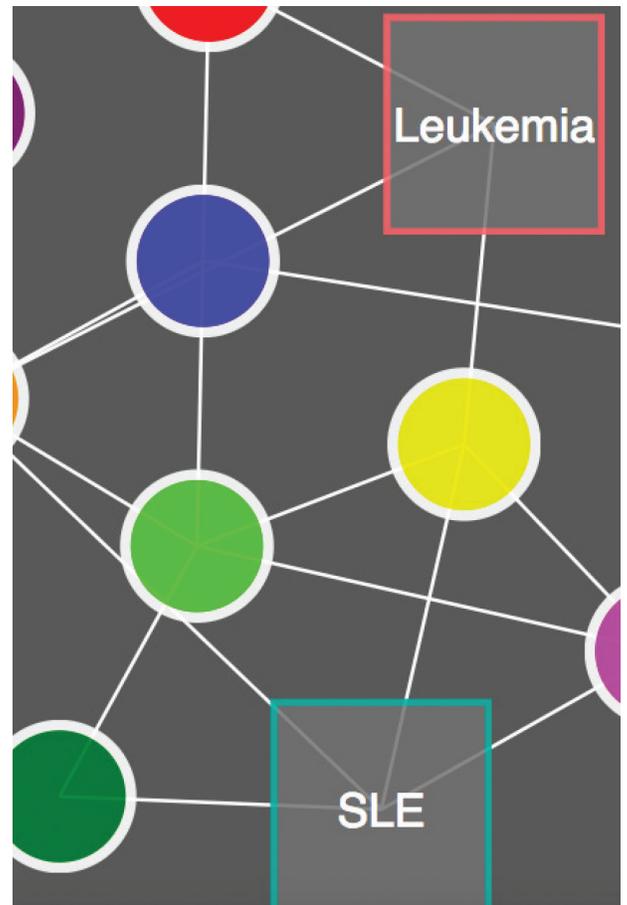
A visualization using test data. Square nodes represent diseases. Circular nodes represent symptoms and display the symptom name on hover.

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