SPOKE Visualizer Video Tutorial

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Date: 10/12/21

Welcome to the SPOKE Visualizer! In this tutorial, we are going to explain what the SPOKE Visualizer is and how to use it. Feel free to follow along as we explore how to visualize certain subsets of the underlying SPOKE data to uncover relationship between food and diseases. Specifically, the SPOKE Visualizer shows connections between foods and diseases via compounds in that food. Let’s have a look at this ourselves.

When you enter the website, you are greeted by a landing page with some information about the size and goal of SPOKE. Click the blue button labeled Spoke Visualizer at the bottom to get to the visualization proper. The next page shows the overview. On the right side, you see a network visualization. On the left side, you see two dropdown menus that allow you to customize what you see in the visualization on the right. Now, let’s select a disease and a food between which we would like to explore connections. From the dropdown menu on the top-left, let’s select coronary artery disease. Then, from the other dropdown menu, let’s select Almond. Now, let’s click Search. Then, the visualization on the right changes. Food, Compound, and Disease are now in normal colors while everything else is in the background. Now, if you move your cursor over the edge between Food and Compound of Disease to learn more about the nature of this connection. For example, we learn that the target (Almond) has a relationship of type “contains” with the source (Folic Acid), meaning simply that almond contains folic acid. Likewise, when we move our cursor over the edge between Compound and Disease, we see that the target (Folic Acid) has a relationship of type “treats” with source (coronary artery disease), which means that folic acid is a good influence on patients with coronary artery disease.

So it is good to know that on a surface level, but would it not be interesting to see these relationships visualized in a way that is more familiar to many of us, like, say a map? Let’s do that! Click the blue Show Details button on the left, and the visualization on the right side changes into a map. If you have ever used Google Maps or a similar application, this will be familiar. The purple marker highlights coronary artery disease; the yellow marker highlights our selected food: almonds. The yellow lines show all the of compounds that are connected to coronary artery disease. Let’s now navigate through this map to uncover more insights. Use your mouse scroll wheel to zoom into the map. Let’s go to the yellow marker. We then see more yellow lines appear, going from other foods to the almond compound. Press and hold the left mouse button to pan along the map. You can then see all the different foods that contain folic acid, like acorn and buttermilk. Panning over to folic acid shows us just how many foods in the SPOKE graph contain folic acid.

In the bottom-right corner, we have what is called a mini-map. This shows an overview of the entire map, with a rectangle showing your viewport, that is what you currently see in the big view of the map. Now, if we want to explore a new connection, we can go back to the overview by clicking theOverview button. We can then simply select new entries in the two dropdown menus on the left. Let’s go with epilepsy and arepa. According to the overview, the connecting compound is Pyridoxine. Let’s click Show Details to get back to the map, and then we see new markers for epilespy in purple and Pyridoxine in yellow.

In this tutorial, we discussed how to select a food and a disease, read the overview visualization, and then navigate the details visualization. Please take some time to explore the SPOKE Visualizer on your own before continuing with the study. Maybe try a few more combinations of food and disease, maybe with your favorite food?