Antibiotic Effectiveness

Concentrate Required to Prevent Growth into Vitro:

Less Concentrate
More Effective

More Concentrate
Less Effective

Gram Staining Test:

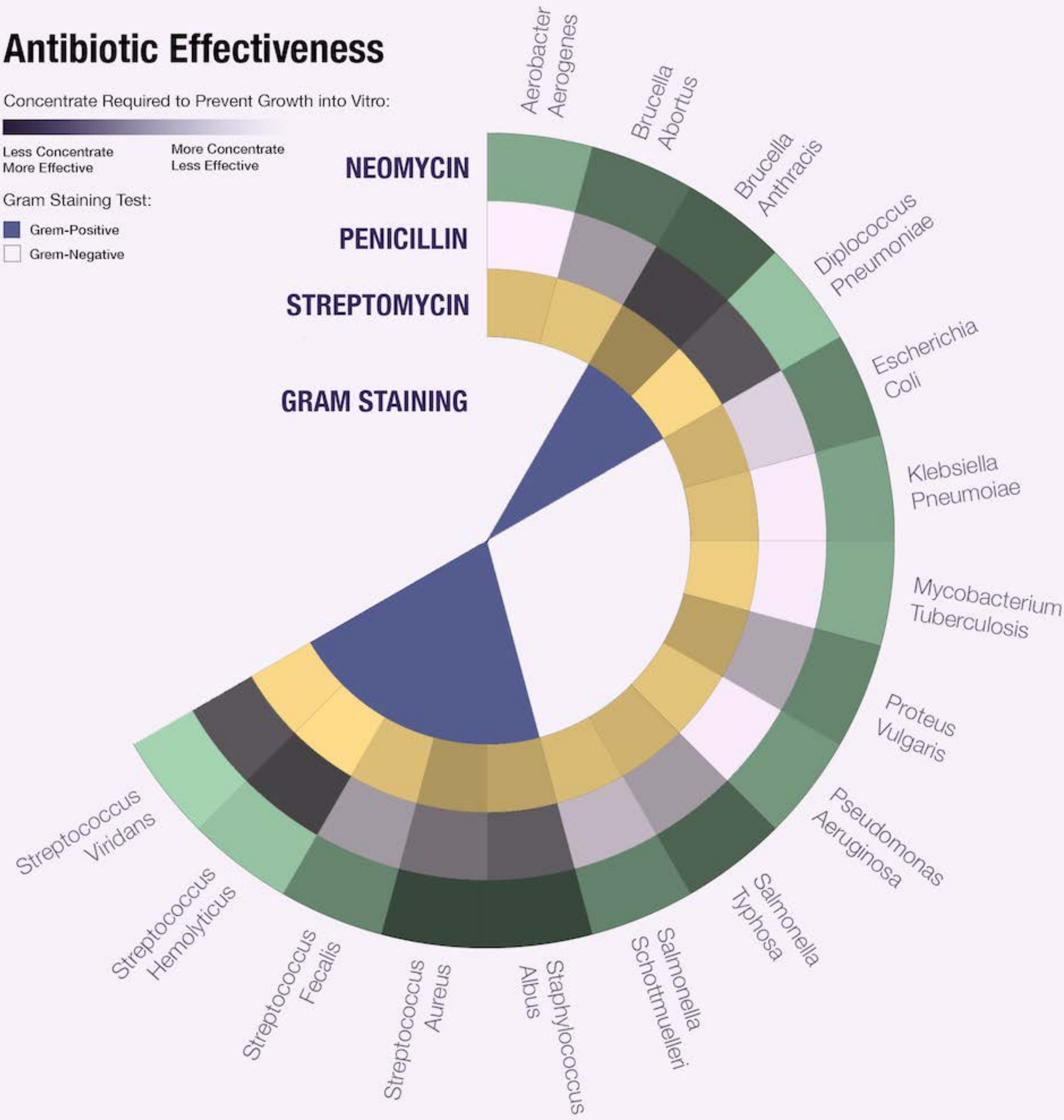
- Grem-Positive
- Grem-Negative

NEOMYCIN

PENICILLIN

STREPTOMYCIN

GRAM STAINING



Antibiotic Effectiveness Visualization Write-up

Visualization Style Selection:

Style: Circle grid to visualize the antibiotic effectiveness on different bacterial infections. Circle gives people a feeling of a union, so showing a table in the circle grid will help to remember the whole table and positions more easily. In the center of the circle grid i used it to showing he gram staining, because the arrow represents some indicator and test meaning.

Order: I ordered three types of antibiotics with alphabet order as Neomycin, Penicillin and Streptomycin for easy memory indexing. Same as the bacterial, I also ordered them with the alphabet order, starting from the top to the left bottom.

Size: Each grid has equal height because they are equally important. Same as the bacterias, I assigned them with equally angle. Initially I used half circle to show all the 16 grid, but then I feel that will be too narrow for each grid and couldn't use the space of the whole page very well, so I increased the size of the grid.

Color: Three different color with some high contrast on the Hue, and less contrast on the Saturation. The differences on the Hue will make grids visually separated. They are all low saturation to keep some visual balance and harmony. Balance difference represents the different antibiotic effectiveness. Darker means less concentration of antibiotic required to precent growth in vitro, which means more effective. Lighter means less effective. Darker - Lighter and More - Less can be visually connected. More often we want to find out more effective antibiotic and darker color always draw more attention. Dark blue represents gram staining positive. Because bacteria that are stained dark blue or violet are Gram-positive. Otherwise, they are Gram-negative.

Text: Labels are next to each grid showing the types of antibiotic and bacteria. Legend on the top left corner is helping user understand the graph.

Data transformation:

Range: The original data range is really large ranging from 0.0001 to 800, it is hard to represent them with color difference, so i take the log of the original data to reduce the range differences. $x' = Log(x) + 10$.

Value: In order to match the color balance range from 0 - 100%, i scale and shift the data with some constants. $x'' = x' / c1 + c2$. In this design, I use $c1 = 2.8$, $c2 = 2.8$.

Visualization Emphasis and Ignorance Analysis:

Effectiveness: The visualization shows the effectiveness level more clearly, people can easily index which antibiotic is more effective to which bacteria. The gram staining is also more meaningful, that people can link the actual test color with the graph. For same type bacteria it's also easy to tell which antibiotic is more effectiveness based on the balance difference.

Drawbacks: The visualization showing the comparison of the effectiveness more clearly, but didn't quantify the real effectiveness level. For example, it is hard to know the real concentration difference from dark to light one, since the data is transferred to a non-linear model.