

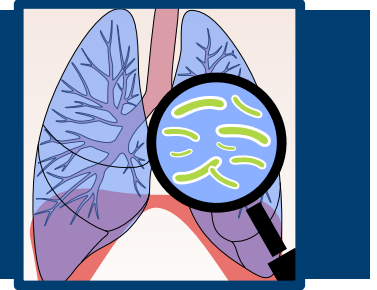
# Student Background

## TUBERCULOSIS

### LESSON 1: GOOD NEWS! TB KILLER ON THE LOOSE!

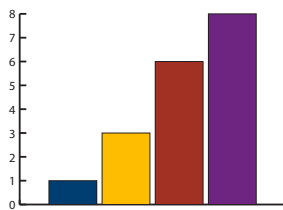
*Activity B: Getting “Graphic” with TB!*

*Activity C: Design a TB Visual Abstract*

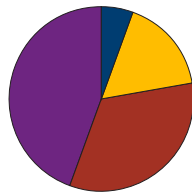


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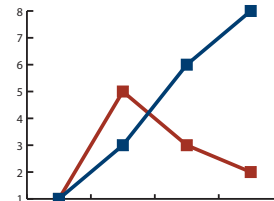
Reading a research article can be overwhelming. Transforming a research article into a shorter and more understandable form can make the information more accessible to the general public. The same is true for research data. The data collected from TB research is often represented by graphs, tables, and charts. Knowing how to interpret graphs, tables, and charts is an important skill. There are different types of graphs: bar graphs, pie charts, line graphs, and whisker plots.



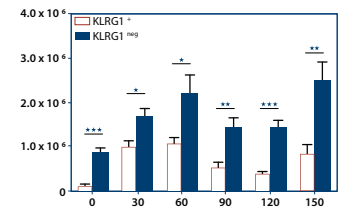
Bar Chart



Pie Chart



Line Graph



Whisker Plot

Bar charts are used to show distribution of data or comparisons between data. Pie charts are used to show a percentage of a whole with each “slice” representing a percent. Line charts are used to show trends or to show comparisons between different data sets. Whisker plots are also known as box plots. The “whisker” is the line which extends above or below the box of data and shows the range of data. Most of the data falls within the range inside the box. However, a few data points fall outside of the box. These data points are statistically important, but are considered “outliers”.

### Directions:

Read the transformed article. Circle/highlight new vocabulary terms. Underline sentences which may be challenging to understand.

The following whisker plot graph represents data from TB research focusing on two different receptors on immune cells called T cells. T cells are released by the thymus gland (T for thymus) which is part of the immune response to TB infection. The graph shows the correlation between two receptors: the KLRG1 and the CD4+ receptor. A receptor is a specialized protein embedded in the cell membrane. Each receptor “recognizes” and connects or bonds with a specific molecule. When bonded to a specific molecule, the receptor can be either “activated” or “inhibited”. If activated, the receptor relays a signal, creates a passage for a molecule to enter the cell, or causes the cell to secrete an enzyme. If inhibited, the receptor causes the cell to stop relaying a signal, closes a pathway to prevent molecules from entering the cell, or stops secreting enzymes.

### MIDDLE & HIGH SCHOOL LEVEL

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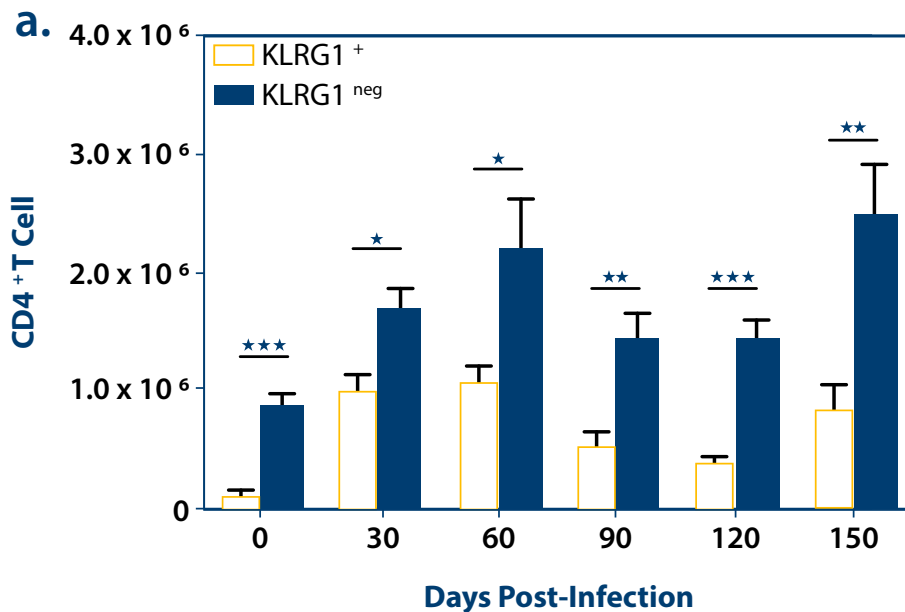
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## LESSON 1: GOOD NEWS! TB KILLER ON THE LOOSE!

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T cells naturally have both types of receptors. In seeking treatments for TB, scientists investigated how different receptors affect one another. In vitro (non-living) experiments suggested the KLRG1 receptor blocked the CD4<sup>+</sup> receptor, which secretes gamma interferon. Gamma interferon is thought to be the body's natural defense against TB bacteria. Scientists hypothesized KLRG receptors interfered with the release of gamma interferon from the CD4<sup>+</sup> receptors. To test this hypothesis, scientists genetically modified mice so their T cells lacked KLRG receptors. Using these mice and wild-type mice (not genetically modified), scientists were able to compare the impact of KLGR1 on CD4<sup>+</sup> gamma interferon release.