

# Rebecca Lancefield

*A dedicated and inspiring microbiologist...*



*By Alexandra Lopez  
Business Development Associate  
HARDY DIAGNOSTICS*

*June 2023*



**T**he Lancefield grouping is a method of serological classification based on the carbohydrate composition of antigens found on the cell walls of catalase-negative Gram-positive cocci. This grouping has been used in various applications since its creation by Rebecca Lancefield in the mid-20<sup>th</sup> century. Today, Lancefield designations are still used to convey medical microbiology test results.(1)



**Figure 1: A young Rebecca Lancefield.**

Rebecca Lancefield was born in Staten Island, New York. While attending college, Lancefield became interested in the sciences and graduated with a degree in zoology. While Lancefield hoped to jump straight into

graduate training, the death of her father placed financial pressure on her family. Lancefield worked as a teacher at a girl's school for a year to financially support her mother and sisters. Through her hard work, Lancefield was able to accept a scholarship to study bacteriology at Columbia University.(2)

Lancefield received her master's degree from Columbia in 1918 and married Donald Lancefield, a fellow student at the Department of Genetics. She was also accepted as a technical assistant into the Rockefeller Institute for Medical Research.(2) At Rockefeller, Lancefield worked alongside molecular biologists Oswald Avery and Alphonse Dochez who had been tasked with studying streptococcal infections.(4)



**Figure 2: Rebecca and Donald Lancefield in 1928.**

During this time, *Streptococcus* was causing an outbreak of infection in Texas and it was unknown whether the cause was one or multiple strains.(3) While working together, the team published a paper after identifying 125 different strains and organizing them into four different group. Despite being a technician, Lancefield was listed as an author due to her integral research for the project.(4)

After returning to Columbia for her PhD, Lancefield joined bacteriologist Hans Zinsser's lab. She was instructed though to move to colleague Homer Swift's lab at Rockefeller because Zinsser did not want to work with a woman.(1) Despite Zinsser's discrimination, Lancefield would break many boundaries in the study of streptococci, earning her PhD and continuing her studies.



**Figure 3: Lancefield accepting the T. Duckett Jones Memorial Award in 1960 for her work on hemolytic streptococci.**

Lancefield's greatest scientific contribution came when she discovered a system to differentiate streptococci. She found that streptococci could be classified into groups based upon the unique carbohydrate antigens in the cell wall of bacteria. This serological grouping method, named the Lancefield grouping, allowed for further understating of strep infection progression and transmission.(3)

# LANCEFIELD GROUPING

Used in classification of gram positive, catalase-negative bacteria based on the carbohydrate composition of bacterial antigens found on their cell walls.

Lancefield group	Bacteria
Group A	<i>Streptococcus pyogenes</i>
Group B	<i>Streptococcus agalactiae</i>
Group C	<i>S. equisimilis</i> , <i>S. equi</i> , <i>S. zooepidemicus</i>
Group D	<i>Enterococcus faecalis</i> , <i>E. faecium</i> , <i>E. durans</i> and <i>S. bovis</i>
Group E	<i>Enterococci</i>
Group F, G & L	<i>S. anginosus</i>
Group H	<i>S. sanguis</i>
Group K	<i>S. salivarius</i>
Group L	<i>S. dysgalactiae</i>
Group M & O	<i>Streptococcus mitior</i>
Group N	<i>Lactococcus lactis</i>
Group R & S	<i>Streptococcus suis</i>

Other *Streptococcus* species are classified as 'non-Lancefield Streptococci'

6

## References

1. [https://en.wikipedia.org/wiki/Lancefield\\_grouping](https://en.wikipedia.org/wiki/Lancefield_grouping)
2. [https://en.wikipedia.org/wiki/Rebecca\\_Lancefield](https://en.wikipedia.org/wiki/Rebecca_Lancefield)
3. <https://www.rockefeller.edu/support-our-science/women-and-science/portrait-initiative/rebecca-lancefield/>
4. <https://massivesci.com/articles/rebecca-lancefield-streptococcus-strep-rheumatic-fever-scarlet-fever-antibiotics-rockefeller/>

Lancefield remained dedicated to her studies until the very end, traveling from her home to her lab as long as her age would allow. Her colleagues appreciated her kindness and her iconic recipe for eggnog (provided below) that she provided for them every Christmas season.

Lancefield passed away at the age of 86, leaving behind over 6,000 streptococci strains that can still be accessed today.(4)

## Dr. Rebecca Lancefield's Eggnog Recipe

This recipe comes from Dr. Rebecca Lancefield (1895 – 1981), a prominent microbiologist who worked at The Rockefeller University. One of her perhaps lesser-known legacies is related to eggnog: every year, she would make eggnog in the lab before Thanksgiving, let it "mellow," and then serve it at Christmas. Forty years later, the eggnog tradition persists in that laboratory.

- 1 dozen eggs
- 1 quart heavy cream
- 1 quart light cream
- 1 pint bourbon
- 1 quart rum
- nutmeg
- sugar to taste (1/2 - 3/4 lb)

Add the light cream with stirring. Add the sugar to taste with mixing (1 pound/batch), then add nutmeg to taste.

Leave standing at least overnight with lid slightly ajar in refrigerator. Serve after 2-3 weeks in the cold.

