[Name of the Writer]

[Name of Instructor]

[Subject]

[Date]

**Assignment**

**Introduction:**

Bacteria are the kind of biological cell. It is the domain of prokaryotes which is a unicellular organism without membrane. Bacteria do not have the specific shape they can be of spiral, rods, or spheres shape. They are the tiny creature of few micrometers in length (*About Microbiology – Bacteria*). Bacteria are useful for human in various way that is why bacteria culture is important to propagate the bacteria by letting them reproduce in pure culture. It is used to understand the type and abundance of the organism. It is also significant to determine the causes of infectious diseases and producing effective vaccines (Gill). Bacteria are needed to be stained to study because they are mainly transparent and dye makes them visible under a microscope. Staining basically means dyeing the bacteria. It is useful to identify the size, shape, and arrangement of the bacterial cell. Stain enable scientists to observe the thickness of the peptidoglycan layer that their cell wall has. Stain increases the visibility in the microscope and also help to identify whether the organism is alive or dead. There are different staining methods including capsule, Gram’s, PHB, and spore staining.

Simple stain technique is performed by dying the microbial with positively charged dye which attracts the negatively charged material present in the organism. It is used to determine the shape, size, and morphology of the bacteria. Gram stain is the staining method that was named after the bacteriologist Hans Christian Gram who introduced the method. Gram stain is useful to identify the bacteria into two different groups known as Gram-negative and Gram-positive. This is why it is also known as a differential stain. In Gram-positive, cell walls have thick layer of peptidoglycan while Gram-negative cell walls have a thin layer of peptidoglycan. In addition, the flagella structure of gram-positive has two rings in the basal body while gram-negative has four rings. Due to the difference in the thickness of the cell walls Gram-positive stain violet while gram-negative stain red during the staining procedure (“Gram Staining”). The Gram staining consist of the steps including staining cells with crystal violet dye followed by addition of iodine solution to form CV-I complex which enhances the dark purple color and then decolorizer like acetone is added to remove the non-retained CV-I and in the end, a counterstain (safranin) is used to stain it red.

Work Cited

*About Microbiology – Bacteria*. https://microbiologyonline.org/about-microbiology/introducing-microbes/bacteria. Accessed 11 Sept. 2019.

Gill, Alexander. “The Importance of Bacterial Culture to Food Microbiology in the Age of Genomics.” *Frontiers in Microbiology*, vol. 8, 2017, p. 777. *PubMed*, doi:10.3389/fmicb.2017.00777.

“Gram Staining.” *Microscopy*, https://serc.carleton.edu/microbelife/research\_methods/microscopy/gramstain.html. Accessed 11 Sept. 2019.