Shelby Thomas

Dr. Pawar

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Microarray normalization refers to the process of removing/ adjusting sources of variation which can affect the measured gene expression. It is important for microarray data to be normalized because it allows us to account for technical variation between the arrays. Normalization can often be represented by a bell-shaped curve, in which its values for it mean (average), median (middle value), and mode (most frequent number in data set) are all the same value, while the standard deviation will always equal one. Sometimes there are outliers, which are values outside the normal range and typically are very rare but can happen due to technical errors. They are also viewed as bias and the goal when these outliers pop up is to try to pull the outliers onto the normal distribution curve. Normalization is important because it controls technical errors and technical variation, while still leaving room for biological variation. Some examples of normalization are RMA normalization and quantile normalization. RMA stands for Robust Multi-array Average and “RMA is a normalization procedure for microarrays that background corrects, normalizes and summarizes the probe level information without the use of the information obtained in the MM probes” (Molecular). Quantile normalization got its name because the normalized datasets have identical quantiles. “Quantile Normalization lets us compare data that has all kinds of noise in it… you just sort each sample data from high to low. If your samples are rows, you then replace the values with the average of each row”(Quantile normalization).

Work Cited

*Molecular organisation and assembly in cells*. RMA and GC-RMA Normalisation. (n.d.). https://warwick.ac.uk/fac/sci/moac/people/students/2003/sam\_robson/usergroups/rmavsmas5/#:~:text=RMA%20is%20a%20normalisation%20procedure,obtained%20in%20the%20MM%20probes.

YouTube. (2017, November 20). *Quantile normalization, clearly explained!!!*. YouTube. https://www.youtube.com/watch?v=ecjN6Xpv6SE