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BIO 620

Assignment 2

Write 2 paragraphs with a minimum of 5-10 sentences on the following techniques of normalization

1. RMA normalization
2. Mas 5.0 Normalization

RMA Normalization is a microarray analysis technique used in interpreting the data generated from experiments on DNA, RNA and protein microarrays. This technique helps researchers to investigate the expression state of a large number of genes most especially, an organism’s entire genome. RMA normalization stands for Robust Multiarray Averaging normalization. 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. Gene chip RMA is an improved form of RMA that can use the sequence-specific probe affinities of the gene chip probes to attain more accurate gene expression. RMA uses a multi-chip model to normalize data and it does not mismatch probes because their intensities are often higher than the match probes. RMA values are in log 2 units. RMA has better precision and provides more consistent estimates for fold change.

Mas 5.0 Normalization is also a microarray analysis technique used in interpreting the data generated from experiments on DNA, RNA and protein microarrays. Mas 5.0 normalization is one of the common techniques used in normalization. It normalizes each array independently and sequentially. it uses data from mismatch probes to calculate a robust average based on subtracting mismatch probe value from match probe value. Mas 5.0 values are not directly comparable because they are not in log2 units. Based on research, most researchers prefer RMA to Mas 5.0 normalization when analyzing data. Mas 5.o compares PM and MM probes. It is usuable with single chips and gives a p-value for expression data. It is a commonly used processing method for Affy chips and it is highly dependent on mismatch probes.

References.

Irizarry, Rafael A, et al. “Summaries of Affymetrix Genechip Probe Level Data.” *Nucleic Acids Research*, Oxford University Press, 15 Feb. 2003, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC150247/.