

Luis Garcia-Lamas

Dr. Yanming Di

Statistical Genomics

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### Journal Club 2 Review Report

In the paper "Principal Components Analysis Corrects for Stratification in Genome-Wide Association Studies" (Price et al., 2006), the authors investigated the effects of population stratification in genome-wide association studies (GWAS) and how these effects can be corrected using principal component analysis (PCA). The authors applied PCA to the data from a GWAS of rheumatoid arthritis to demonstrate the effectiveness of this method in correcting for population stratification (Nature Genetics).

The authors found that PCA was able to effectively correct the effects of population stratification in their GWAS of rheumatoid arthritis. The results of the association analysis showed a significant reduction in the false positive rate after applying PCA to the data. From this stuff, it seems that PCA is a powerful tool for reducing the impact of population stratification on the results of GWAS.

In addition to its effectiveness in correcting for population stratification, the authors also discussed the advantages of PCA in GWAS. PCA allows for the identification of the underlying population structure in the study sample, which can be used to control for the effects of population stratification in the association analysis. This can lead to more accurate results and increased confidence in the conclusions of

the study (Nature Genetics). Furthermore, PCA is computationally efficient and can be easily applied to large data sets, making it a practical solution for controlling population stratification in GWAS.

In conclusion, the study by Price et al. (2006) highlights the importance of considering population structure in genetic association studies and provides strong evidence for the utility of PCA in controlling for the effects of population stratification in GWAS. In my opinion, this is a valuable contribution to the field and highlights the need for appropriate statistical methods to be used in genetic association studies. The results of this study suggest that PCA is a useful and powerful tool for reducing the impact of population stratification on the results of GWAS and for increasing the accuracy and confidence of the conclusions drawn from these studies.

#### **Sources:**

Price, Andrew L., et al. "Principal Components Analysis Corrects for Stratification in Genome-Wide Association Studies." *Nature Genetics*, vol. 38, no. 8, 2006, pp. 904-909.