



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Swetha Revanur	Project Number S1210
Project Title Multi-Dimensional Genomic Data Analysis of Hidradenitis Suppurativa (Acne Inversa) and Associated Comorbidities	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Hidradenitis Suppurativa (HS) is a debilitating chronic skin disease marked by large, painful cysts. There is very little research being conducted on HS (1% prevalence yet no treatment/cure exists). I performed a novel multi-dimensional genomic data analysis of HS and its comorbidities (Crohns Disease, Down Syndrome, Rheumatoid Arthritis (RA), Squamous Cell Carcinoma (SCC), and Hypothyroidism) as they are better understood than HS itself. I analyzed gene, pathway, and microRNA relationships between the diseases to shed light on HS.</p> <p>Methods/Materials I compiled a collection of data sources for every dimension. After I acquired a pre-curated data set from every database, I performed data cleansing. I utilized Microsoft Excel functions to remove duplicates, extra lines, and standardize the format. I analyzed these curated sets for each disease and dimension.</p> <p>Results Genes IL6, IL10, and TNF seem to play an active role in all comorbidities. Alzheimers Disease pathway plays a major role in some comorbidities. These diseases seem to have a strong genomic correlation. There are few common pathways with HS marker genes between HS and Down/Hypothyroidism. Certain miRNAs directly influence HS marker genes and several diseases.</p> <p>Conclusions/Discussion HS has a strong correlation with SCC and RA, a moderate correlation with Crohns and a relatively weak link with Down and Hypothyroidism. hsa-miR-214, hsa-miR-31, and hsa-miR-7 can be identified as biomarkers of HS since they influence HS marker genes. My study also provides a rationale for why HS is seen more often in women by utilizing links with estrogen regulation.</p>	
Summary Statement A novel multi-dimensional (microRNA, gene, pathway) analysis of Hidradenitis Suppurativa and its commorbidities	
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