Review of:

“*Genome-wide transcriptional analysis of T cell activation reveals differential gene expression associated with psoriasis”* [1]

Sam Brown, Wayne Kunze, Caleb Perry

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# Introduction

The paper selected for review investigates the genetic mechanisms that cause activation of T cells, responsible for the inflammation of skin is sufferers of Psoriasis, a common autoimmune disease.

Short description of method

Short details on data set background. Large p

Our methods

Supervised

Feature Reduction

Unsupervised

# Data Set and Paper

The paper examines Gene expression profiles from in vitro activated T cells from 17 psoriasis patients and 7 control subjects. The data set developed for this study contains 47,222 transcripts for each sample cataloging the level of gene expression in the activated T-cells for each gene in each individual.

More details on data set

WCGNA

Focus on ID of genes, not pathways or biological background

# Results

Were we able to find SPAT2L and KLF6 as highly expressed

# New methods used

Tree

PCA

Clustering

# Conclusions

Comparisons to original paper findings

Difficulty with large feature/small sample data set

Cross-Validation

Future: SVM?

# References

Palau, Julia, Ferrandiz, Puig, Fonseca, Fernadez, Lopez-Lasanta, Tortose, Marsal. "Genome-wide transcriptional analysis of T cell activation reveals differential gene expression associated with psoriasis." *BMC Genomics*  (2013): 14:825

James, Witten, Hastie, Tibshirani. *An Introduction to Statistical Learning with Applications in R*. New York, NY: Springer, 2013. Ebook.

Hastie, Tibshirani, Friedman. *The Elements of Statistical Learning*. New York, NY: Springer, 2009. Ebook.

# Source Code

Table 1: Significantly Upregulated genes in Psoriasis patients compared to healthy controls

|  |  |  |  |
| --- | --- | --- | --- |
| Probe | Gene | Fold Change | P value |
| |  | | --- | | ILMN\_1683678 | | ILMN\_1735014 | | ILMN\_1703263 | | ILMN\_2322498 | | ILMN\_2246956 | | ILMN\_2397721 | | ILMN\_1781285 | | ILMN\_2321064 | | ILMN\_1731107 | | ILMN\_1729749 | | ILMN\_2095660 | | ILMN\_1681301 | | ILMN\_1767470 | | ILMN\_1735979 | | ILMN\_1719543 | | ILMN\_2188333 | | ILMN\_1776723 | | ILMN\_1721626 | | ILMN\_1773742 | | ILMN\_1741003 | | ILMN\_1729374 | | ILMN\_1660368 | | ILMN\_2406410 | | ILMN\_2305112 | | ILMN\_2284998 | | |  | | --- | | *SPATS2L* | | *KLF6* | | *SP140* | | *RORA* | | *BCL2* | | *GLB1* | | *DUSP1* | | *BAX* | | *CCDC92* | | *HERC5* | | *TMEM156* | | *AIM2* | | *SCPEP1* | | *BCKDHA* | | *MAF* | | *CD69* | | *PHF11* | | *ARID5B* | | *DNAJB9* | | *ANXA5* | | *ETFB* | | *TRRAP* | | *RHBDD2* | | *CTH* | | *SP100* | | |  | | --- | | 1.37 | | 1.32 | | 1.38 | | 1.31 | | 1.23 | | 1.23 | | 1.21 | | 1.24 | | 1.33 | | 1.72 | | 1.29 | | 1.42 | | 1.26 | | 1.21 | | 1.36 | | 1.33 | | 1.24 | | 1.27 | | 1.23 | | 1.27 | | 1.23 | | 1.20 | | 1.39 | | 1.57 | | 1.27 | | |  | | --- | | 0.0009 | | 0.0012 | | 0.0025 | | 0.0041 | | 0.0062 | | 0.0062 | | 0.0071 | | 0.0096 | | 0.0136 | | 0.0267 | | 0.0453 | | 0.0464 | | 0.0469 | | 0.0639 | | 0.0658 | | 0.0677 | | 0.0683 | | 0.0788 | | 0.0805 | | 0.0896 | | 0.0921 | | 0.0922 | | 0.0925 | | 0.0944 | | 0.0944 | |

Table 2: Significantly Upregulated genes in Psoriasis patients compared to healthy controls

|  |  |  |  |
| --- | --- | --- | --- |
| Probe | Gene | Fold Change | P value |
| |  | | --- | | ILMN\_3286813 | | ILMN\_3281502 | | ILMN\_1778617 | | ILMN\_1689294 | | ILMN\_2143250 | | ILMN\_1720114 | | ILMN\_2135175 | | ILMN\_1764163 | | ILMN\_1746148 | | ILMN\_1715401 | | ILMN\_2299072 | | ILMN\_2124802 | | ILMN\_1655827 | | ILMN\_2402936 | | ILMN\_3230435 | | ILMN\_1803799 | | ILMN\_1704873 | | |  | | --- | | *LOC391019* | | *LOC653375* | | *TAF9* | | *LOC85390* | | *FAR1* | | *GMNN* | | *SNORD36A* | | *LOC644330* | | *LRRC33* | | *MT1G* | | *CROP* | | *MT1H* | | *COPS2* | | *LOC440926* | | *LOC729086* | | *LOC649555* | | *TCEB1* | | |  | | --- | | -1.38 | | -1.31 | | -1.25 | | -1.20 | | -1.20 | | -1.20 | | -1.27 | | -1.20 | | -1.22 | | -1.82 | | -1.20 | | -1.64 | | -1.20 | | -1.22 | | -1.24 | | -1.21 | | -1.21 | | |  | | --- | | 0.0001 | | 0.0009 | | 0.0009 | | 0.0120 | | 0.0207 | | 0.0269 | | 0.0303 | | 0.0577 | | 0.0656 | | 0.0677 | | 0.0683 | | 0.0778 | | 0.0800 | | 0.0827 | | 0.0886 | | 0.0921 | | 0.0970 | |

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