

# TCGA PanCancer Analysis

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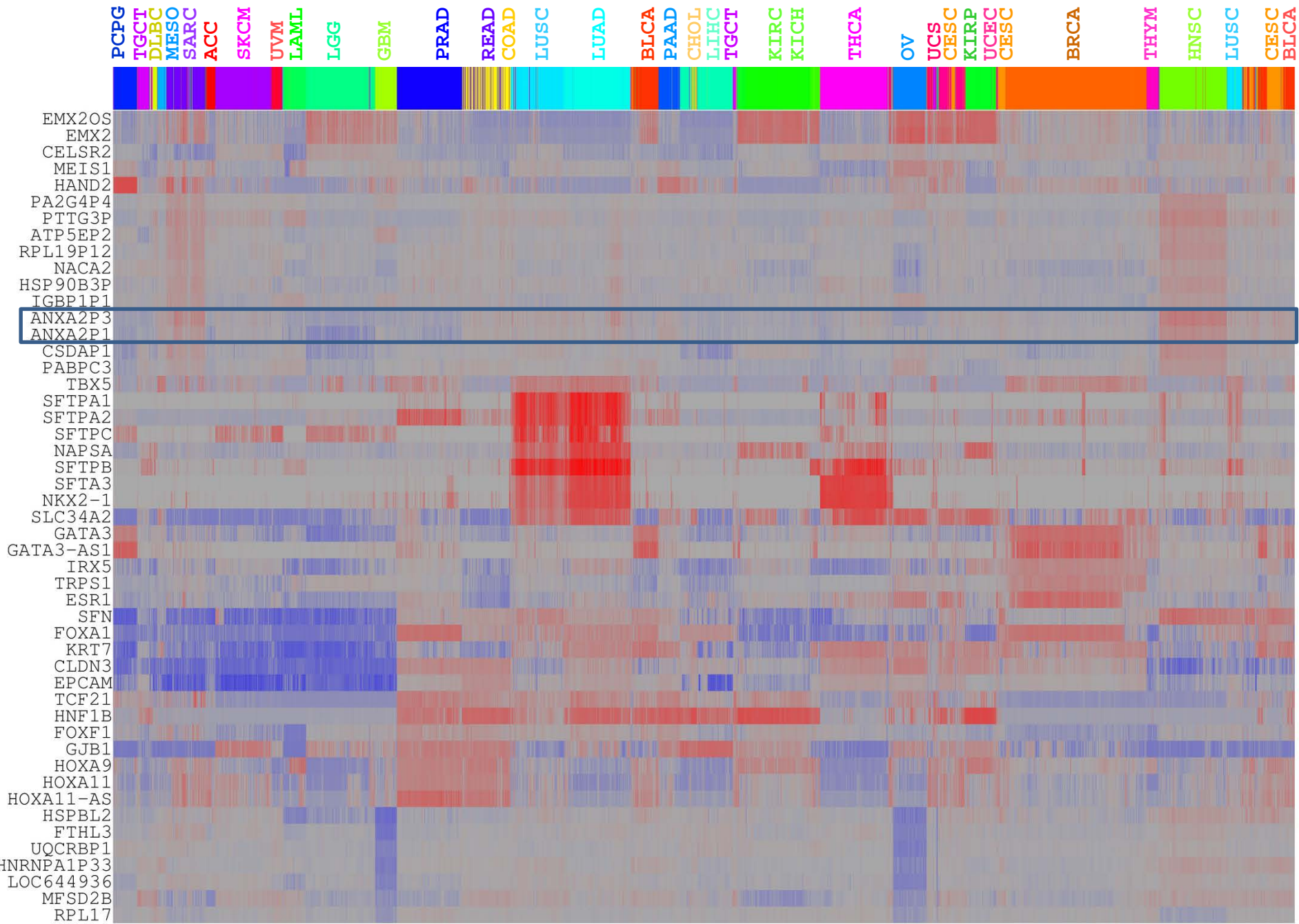
# Bhattacharyya Distance

- Find the Bhattacharyya bound given means and covariances of single Gaussian distributions.

$$D_B = \frac{1}{8}(\mu_2 - \mu_1)^T \times \left(\frac{\Sigma_1 + \Sigma_2}{2}\right)^{-1}(\mu_2 - \mu_1) + \frac{1}{2} \ln\left(\frac{\det\left(\frac{\Sigma_1 + \Sigma_2}{2}\right)}{\sqrt{\det \Sigma_1 \det \Sigma_2}}\right)$$

$$P_{error} = \sqrt{p_1 \times (1 - p_1)} \times \exp^{-D_B}$$

Pearson



# Top 49 Genes (1 vs 1)

Gene Name	Tumor	Tumor	P error	References
ANXA2P1	HNSC	LGG	0.002	HNSC: [3]
	HNSC	PCPG	0.003	
	HNSC	PRAD	0.006	
ANXA2P3	HNSC	OV	2.8e-6	HNSC: [3]
	HNSC	LGG	5.7e-5	
	HNSC	TGCT	6.1e-5	
ATP5EP2	HNSC	TGCT	0.006	
	GBM	TGCT	0.009	
	SARC	TGCT	0.010	
C14orf19	SARC	TGCT	0.057	
	LUSC	SARC	0.058	
	LIHC	SARC	0.058	
CELSR2	DLBC	UVM	0.0007	
	DLBC	LGG	0.0009	
	DLBC	THCA	0.003	
CLDN3	GBM	READ	2.4e-9	
	LGG	READ	5.2e-9	

# Top 49 Genes (1 vs all)

Gene Name	Tumor	P error	References
ANXA2P1	BLCA	0.133	
	BRCA	0.221	[1]
	CESC	0.357	
ANXA2P3	BLCA	0.064	
	BRCA	0.274	
	CESC	0.283	
ATP5EP2	BLCA	0.178	

# References

1. Yin P, et al,. Genome-Wide Progesterone Receptor Binding: Cell Type-Specific and Shared Mechanisms in T47D Breast Cancer Cells and Primary Leiomyoma Cells. PLoS One. 2012; 7(1): e29021. Published online 2012 Jan 17. doi: 10.1371/journal.pone.0029021
2. <http://tcng.hgc.jp/index.html?t=gene&id=305>
3. The Role of Annexin A2 in Tumorigenesis and Cancer Progression