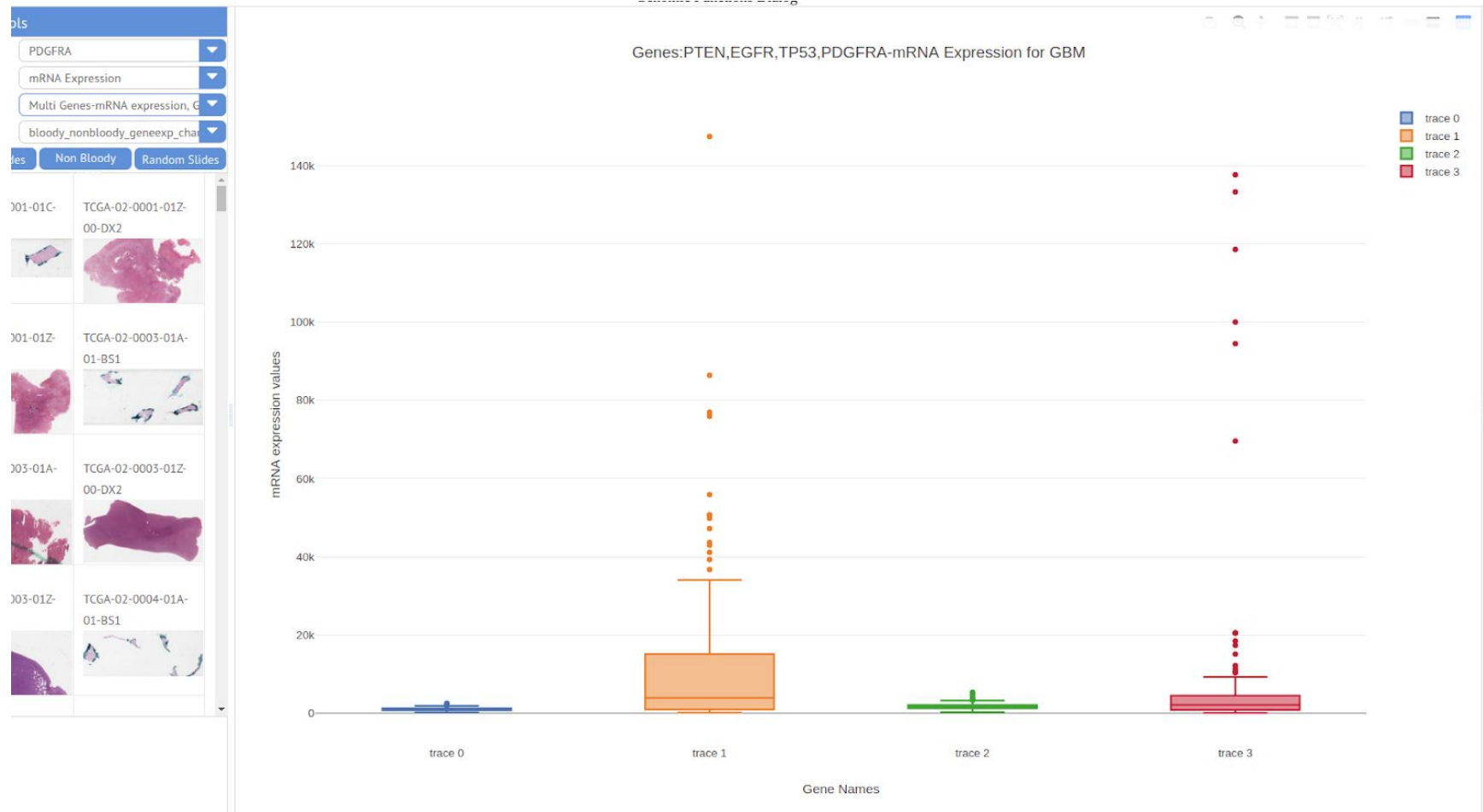
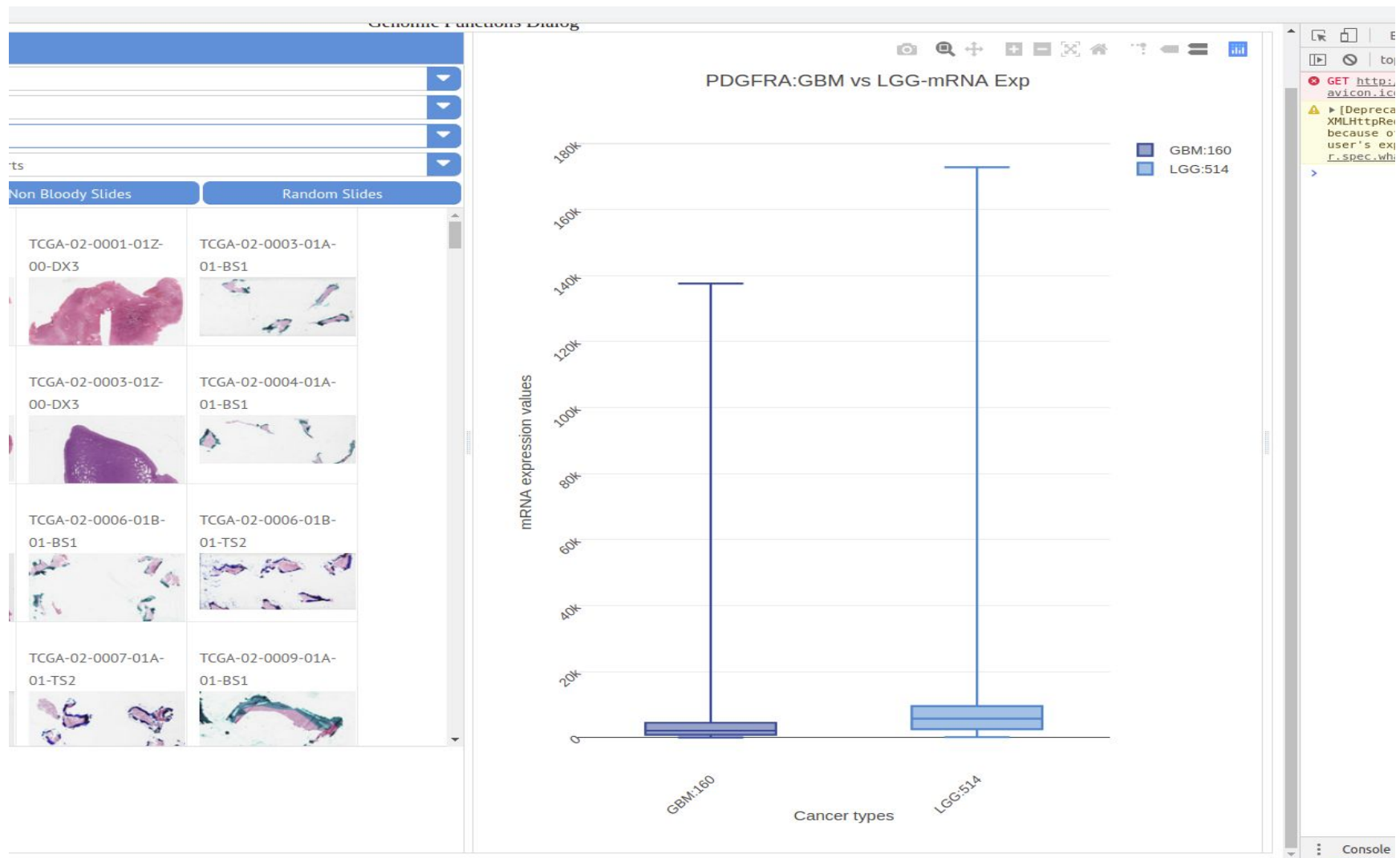


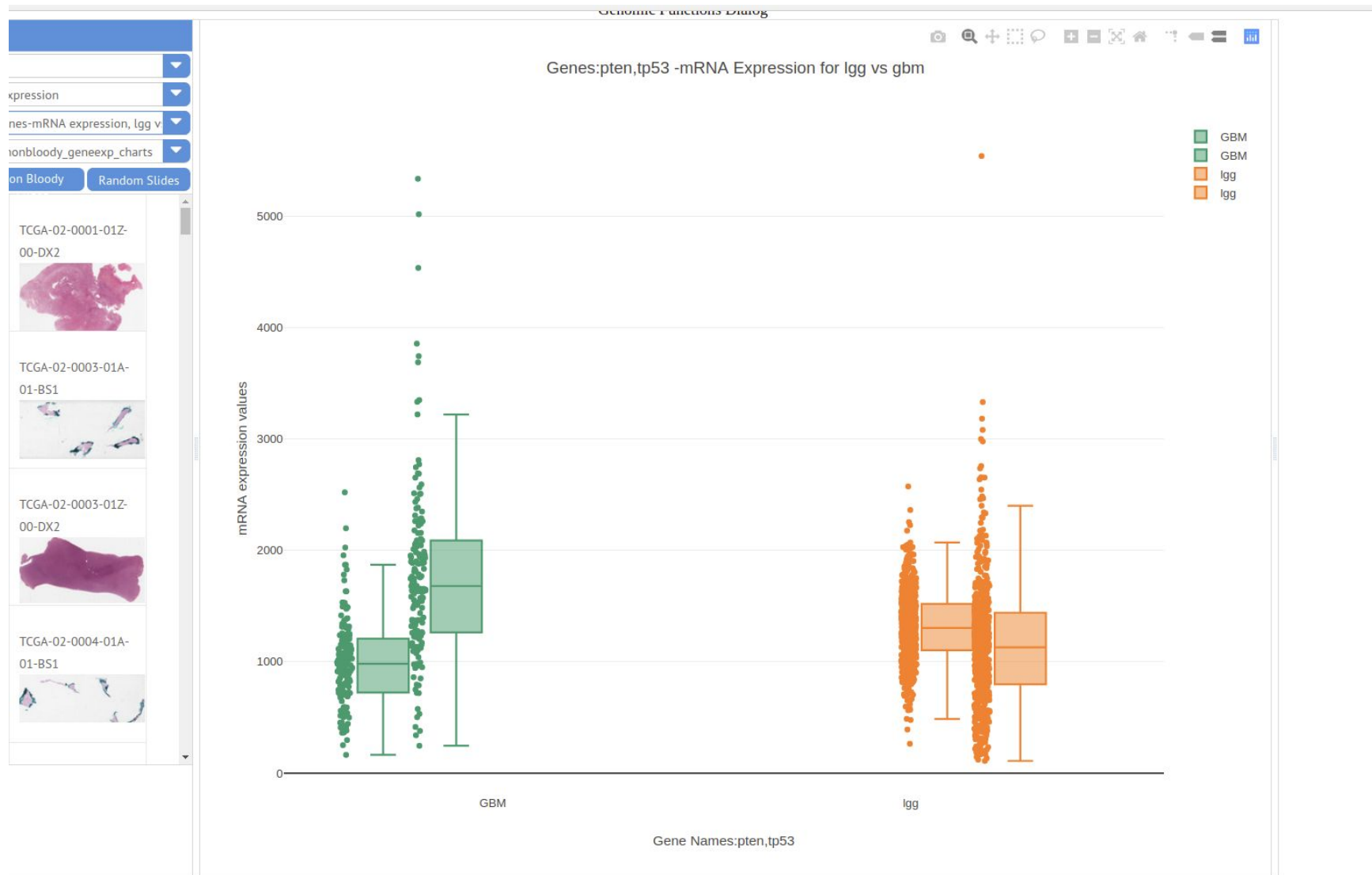
## mRNA expression of PTEN, EGFR, TP53, PDGFRA on GBM



## mRNA expression of PDGFRA gene on GBM vs lgg

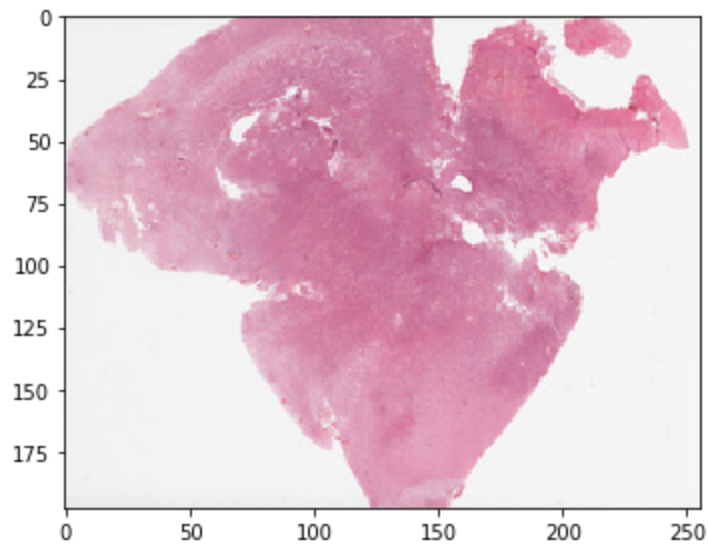


## mRNA expression of pten, tp53 genes on GBM vs lgg groups



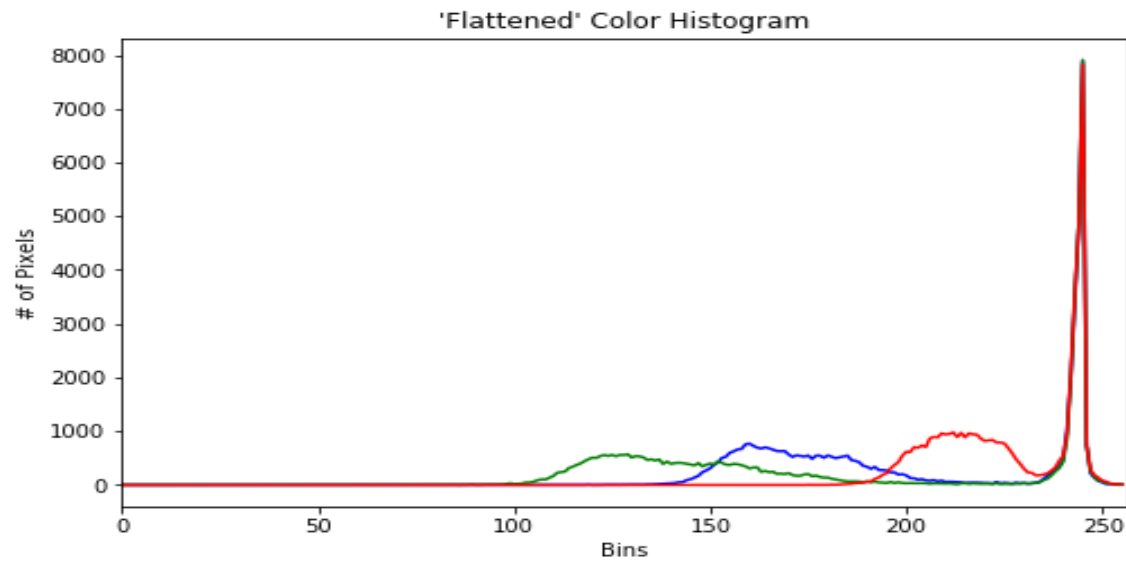
**A python pipeline to extract Quantitative/statistical Features from the Histo images for subsequent cancer grading/classification (Need to be integrated with DSA\_UI)**

**Original Image**

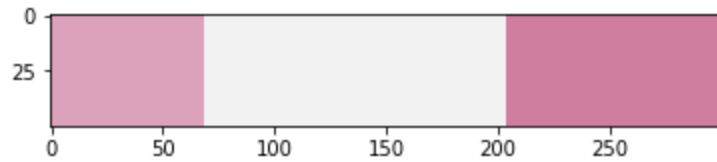


Comments:

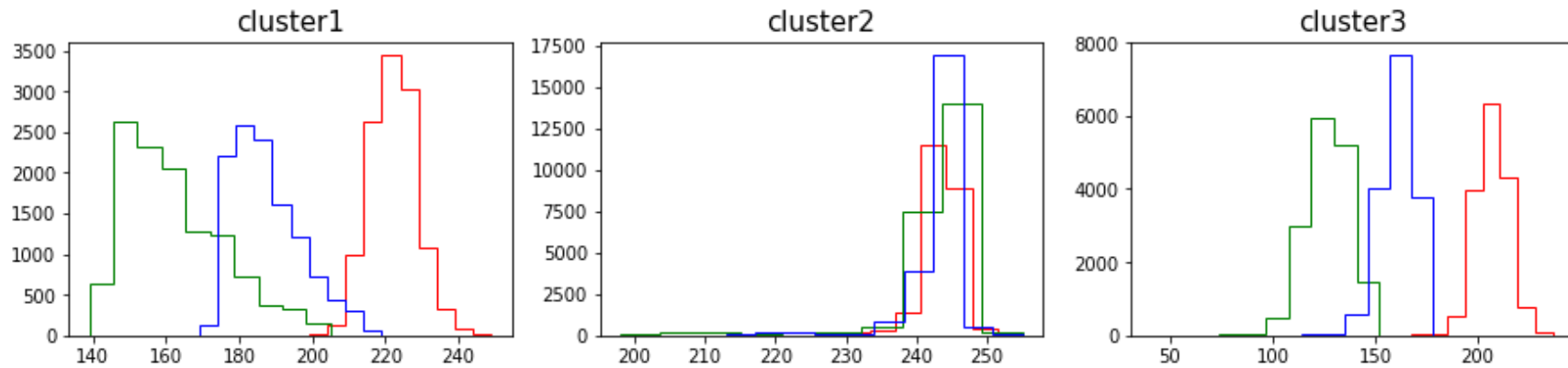
**Color histogram of above image against each channel (R,G,B)**



**Bar showing most dominant colors in the above image, based on kmeans cluster (3 clusters)**



Heatmap of above image clusters with RGB channels:



#### Pythonic Neuro Image Analysis pipeline to generate object detection

1. Generate random Tiles from selected GBM-SVS slide (grabTiles\_forTraining\_gbm.py), by doing
  - a). Simple Masking on lowResPILImage
  - b). Getting intended tiles using Girder calls on candygram server
2. Standard Colour deconvolution using HistomicsTK to generate Hematoxylin-stain, Eosin-stain images from the given tile
3. Generate histologic components or histologic objects by quantizing pixels in the above H-Stain and E-Stain channel into following groups (approximation)
  - a. Purple Pixels - Cell Nuclei material
  - b. Pink pixels - Stroma, Stomal cells' cytoplasams, mucin-poor epithelial cells's cytoplasms
  - c. White pixels - Lumina, mucin-rich epithelial cells's cytoplasms
4. Using least squares circle fitting algorithm for a set of 2D points (x,y) generate all the possible local histological objects of above color-grouped pixels
 

Need to detail out the steps needed in this algorithm
5. From the above generated local histological objects, classify the tissue images
 

Need to detail out the steps needed in this algorithm

A pipeline which generate object detection in the above image using further

1. Sub-clustering on the above 3 clusters
2. Obtain spatial information by using Gray Level co-occurrence matrix
3. Segmentation and Classification

#### Reference

##### Image Analysis Pipeline :

1. Local Object Patterns for the Representation and Classification of Colon Tissue Images, Gulden Olgun, Cenk Sokmensuer, and Cigdem Gunduz-Demir, IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS, VOL. 18, NO. 4, JULY 2014

##### Glioblastoma pathogenesis:

1. Discovery and validation of a glioblastoma co-expressed gene module, Leland J. Dunwoodie<sup>1</sup>, William L. Poehlman<sup>1</sup>, Stephen P. Ficklin<sup>2</sup> and Frank Alexander Feltus<sup>1</sup>