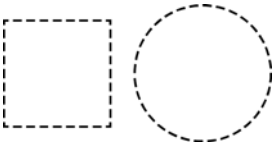
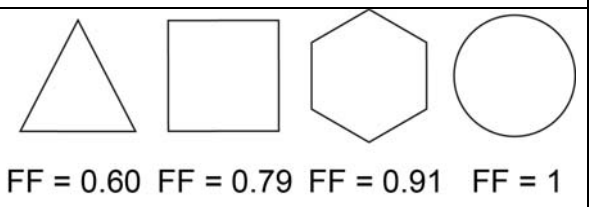
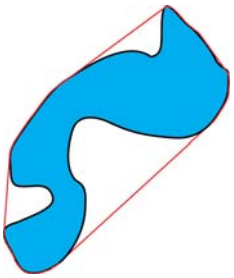
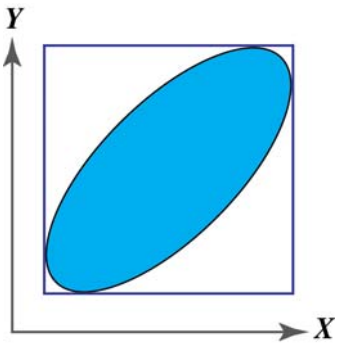
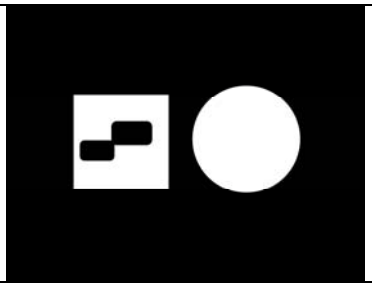
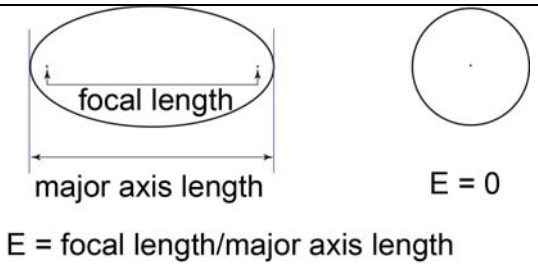
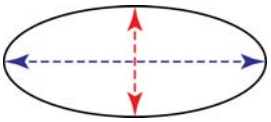
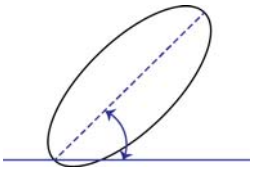
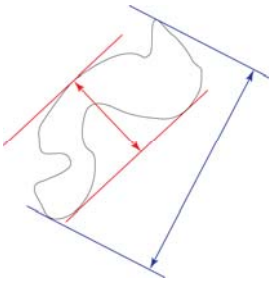
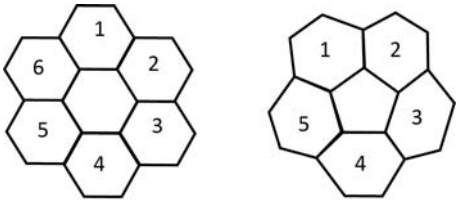
Appendix 9: Cell size and shape measurements used in this study.

Metric Name	Definition or Mathematical Formula	Examples
Area	Actual number of pixels or square microns in a cell. Example of a square and circle with the same area	
Perimeter	Distance following the edges of a single cell. Example of a square and a circle with the same perimeter.	
Form Factor	4*pi*Area/Perimeter^2,	
Solidity	Area / Convex Hull Area The convex hull area is that circumscribed by a rubber band stretched around an object.	
Extent	Area divided by area of a bounding box.	
Euler Number	Number of objects in the image minus the number of holes in those objects. Example: On the black background the white circle and square contribute +2 and the bi-lobar black object contributes -1, for an Euler Number of +1.	
Cell center location (X and Y coordinates)	X,Y coordinates of the "center of mass" of a cell.	
Eccentricity	Ratio of distance between	

	focal length of an ellipse and major axis length. A circle has no focal length, and E=0.	
Major and Minor Axis Length	Length of major (Blue) and minor (Red) axis of an ellipse best fitting a cell	
Orientation	Angle between x-axis and major axis of best-fitting ellipse	
Compactness	(4*Area/pi)^1/2 / Max Diam	
Median and Mean Radius	Median and Average distance of any point in a cell to the closest point outside the cell.	
Minimum and Maximum Feret Diameters	Minimum (Red) and Maximum (Blue) distance between two parallel tangential lines touching the edge of a cell; also known as "Caliper distance."	
Zernike shape features	These characterize a cell using the coefficients from Zernike polynomials invariant to cell orientation.	
Sidedness	The number of neighbors of a given cell. The center cell has 6 sides and 6 neighbors on the left image and 5 on the right image.	
Number of cells	Count of the number of cells	