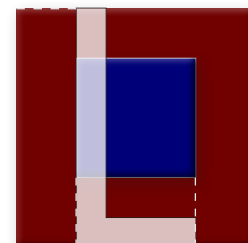


BASIC DEFINITIONS

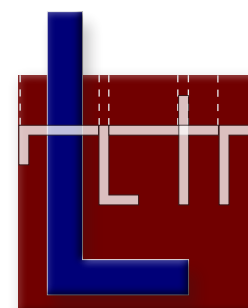
Name	Description	How its calculated	Unit
Pixel size	The width of an image pixel, height = width.	Calibrated	μm
Pixel area	The size of the area that is imaged by a pixel.	$Pixel\ size \times pixel\ size$	μm ²
Cell perimeter pixel	A pixel of the 2-dimensional perimeter of a cell.	The perimeter pixels of a cell are set by the user when identifying cells.	
Cell pixel	A pixel that is a <i>cell perimeter pixel</i> or is on the inside of the <i>cell perimeter pixels</i> .	Automatically	
Optical density difference	The difference in optical density between the cell and the surrounding cell culture media.	The optical density (refractive index) of the cells and the cell culture media are given by the user.	
Pixel thickness	The calculated physical thickness of a pixel.	The phase shift of the illuminating light of a pixel is obtained from the recorded hologram. Its is proportional to the physical thickness of the cell in the point imaged by the pixel \times optical density difference.	μm



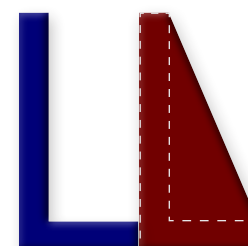
The **eccentricity** of L is $1 - \frac{\text{area of the blue square (width} \times \text{width)}}{\text{area of the red square (height} \times \text{height)}}$.

PARAMETER DEFINITIONS

Name	Description	How its calculated	Unit
Area	The projected 2-dimensional cell area as viewed by the image sensor.	$Pixel\ area \times \text{the number of cell pixels}$	μm ²
Average thickness	The calculated average thickness of a cell.	$Average\ pixel\ thickness\ of\ the\ cell\ pixels$	μm
Volume	The calculated volume of a cell.	$Average\ thickness \times area$	μm ³
Perimeter length	The length of the cell perimeter.	$\text{The number of cell perimeter pixels} \times pixel\ size.$	μm
Eccentricity	The elongation of a cell. A value of 0 means that the cell perfectly fits within a square. A higher value means that the cell only fits perfectly within a rectangle.	The square root of $1 - \frac{w^2}{h^2}$ where h and w are the height and width of the minimum rectangle, $w \leq h$.	
Irregularity	A value of 0 means that a cell is circular. A higher value means a longer, more irregular perimeter.	$1 - 4\pi \times \frac{area}{perimeter\ length^2}$	
Hull convexity	Measures <i>pixel thickness</i> roughness. When the optical density of a cell varies smoothly this corresponds to surface roughness. A value of 1 means that the cell hull has no surface dents.	$volume / volume\ without\ indents$	
Migration (distance)	The distance between two cell positions of the same cell at different points in time.	Pythagorean theorem	μm
Motility (distance)	The length of the track traveled to move the migration distance.	Sum of Pythagorean theorem	μm
Directness	A cell traveling in a straight line has a value of 1.	$Migration / motility$	
Motility speed	The current speed of a cell.	$\frac{motility\ distance\ of\ the\ 5\ latest\ movements}{(5 \times time)}$ where time is the time interval between image frames.	μm/h



The **irregularity** of L is $1 - \frac{\text{area of the blue L}}{\text{area of the red square}} \times \frac{1}{perimeter\ length^2}$.



The **hull convexity** of L in 2 dimensions is the ratio of the area of the blue L and the red shape, L without indents.