

## Texture Analysis in Cervical Optical Coherence Tomography Images of Pregnant and non-Pregnant Women

**Introduction:** Pre-term birth is a dangerous complication that can occur during pregnancy that can be linked to premature remodeling of the cervix. Over the course of the summer, we attempted to identify this remodeling of the cervix using a noninvasive imaging technique called optical coherence tomography (OCT). This summer, we attempted to use texture analysis to differentiate between the OCT images.

**Methods:** Before the start of the summer, 13 cervix specimens were taken from 11 non-pregnant hysterectomy patients and 2 pregnant patients undergoing Cesarean hysterectomy. The cervix specimens were then divided into 3mm-5mm slices, imaged with OCT, and pre-processed. In MATLAB, the images were separated into 50x50 grids, and a texture analysis was performed on each grid cell of the OCT images to assess contrast, correlation, energy, and heterogeneity.

**Results:** In order to quantify the differences between these properties for pregnant and non-pregnant specimens, the receiver operator curve was found and the mean +/- 95% confidence interval was calculated, and t-tests showed that there was a statistical difference for all four properties between pregnant and non-pregnant cervix specimens. The highest difference seen was in correlation, with an AUC of .71.

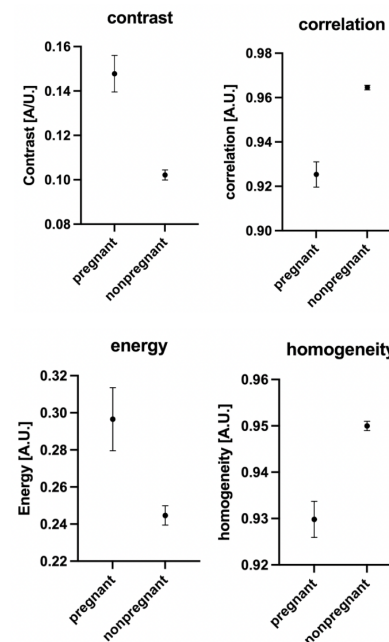
**Conclusions:** Our research has proven that there is a statistical difference in texture

analysis between pregnant and non-pregnant specimens, but there is not yet enough evidence to be able to differentiate between pregnant and non-pregnant cervix specimens.

### References:

1. Wang Y. et al. PLOS. 2016.
2. Gan Y. et al. Optica. 2015

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**Figure 1.** Shows the mean +/-95% confidence interval for each texture feature.