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Optical Coherence Tomography Application to Alopecia in the Scalp

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Opportunity and Significance
- Alopecia is the loss of hair, whether it be from the scalp or other regions of the body.
- Need for efficient and accurate alopecia diagnosis techniques
- Current techniques used to best diagnose and track alopecia are often invasive, requiring a biopsy for results
- The use of the OCT, or optical coherence tomography, could drastically improve a patient's experience in undergoing a diagnoses while proving accurate results.
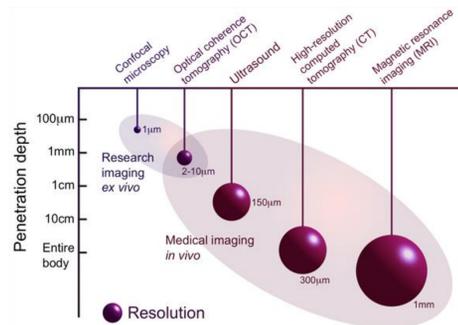
Technical Objectives
The objective is to develop diagnostic algorithms for the rapid, non-invasive diagnosis of alopecia with OCT. The first step is collecting OCT images of a healthy scalp to understand the anatomical structures with the imaging technique

Commercialization Plan
When a precise algorithm is achieved, training will be implemented at clinics to teach medical professionals how to use the method of OCT to diagnose and track progression of alopecia.
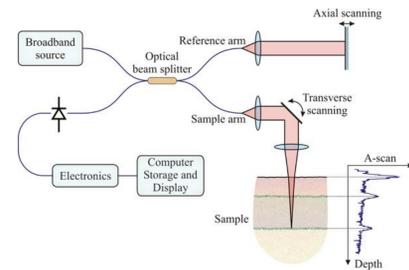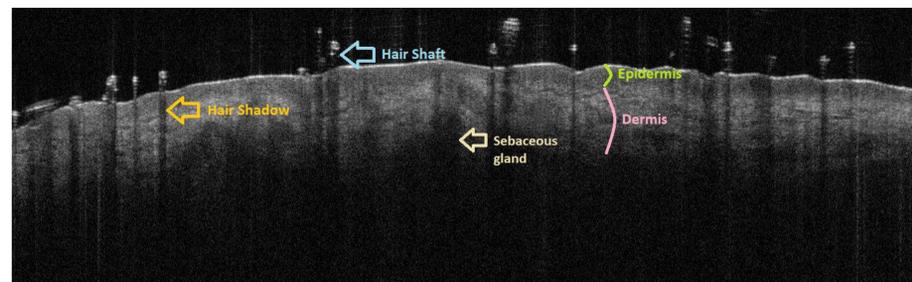

Biopsy

Alopecia

Ideal OCT Scalp image with Minimal Hair Interference

OCT Scalp image with Hair Interference

Collect scalp OCT images of alopecia patients, and compare images to trichoscopy or biopsy result

Develop algorithm for alopecia diagnoses through OCT imaging

Implement OCT method in clinics as an effective, non-invasive diagnoses technique for alopecia in the scalp.

State of Practice
The current obstacle is the hair impeding the scalp OCT image; this may lead to specific modification for development such as trimming a small section of hair, if necessary. Patients undergoing different types of alopecia are still being sought out, as a patient must be followed to acquire both OCT images and final diagnoses through the current methods of biopsy or trichoscopy.

Next Steps for Development and Test
- Collect OCT images of various forms of alopecia to determine patterns that help differentiate and diagnose the various forms of alopecia.
- Relate scans to the patients' biopsy or trichoscopy results to develop diagnoses algorithm
- Begin to develop additional algorithm to track progression of alopecia treatment