UNIVERSITY OF WYOMING
Wyoming Technology Transfer and Research Products Center

Non-Intrusive Laser-Based Technique for Monitor and Control of Protein Denaturation of Surfaces

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Patent Status:
Utility Patent Pending

Description of Technology

Denaturation takes place when a protein's bonds start to break and the protein loses its three-dimensional structure. Denaturation is often performed in tissues for in situ protein identification as part of a biological imaging measurement. A method for controlling the extent of denaturation is needed because without such a method, knowing the required length and severity of a denaturation treatment is difficult. Currently, extensive trial and error approaches determine the optimal conversion conditions for each type of sample. Such an inaccurate approach is not optimal due to variability between samples of a given type such as tissue thickness. Intrusive techniques for monitoring protein conversion, such as thermocouples during thermal treatment, are also not suitable because of the small sample size and the likelihood that intrusive measurements will interfere with the effectiveness of the treatment.

Researchers at the University of Wyoming have invented a way to control and monitor denaturation by a creating a non-intrusive, laser-based technique. The technique directs a low power laser through the sample to a photodetector. The baseline transmissivity of the sample is observed throughout treatment of the sample through continuous monitoring of the signal voltage detected at the photodetector. Protein denaturation corresponds to a significant increase in sample transmissivity. A detected increase indicates the desired end of treatment.

Applications

This laser-based technique identifies in situ protein in a much faster and repeatable way than previous methods, leading to better results in lab experiments.

Features & Benefits

- Provides real-time feedback regarding protein denaturation and digestion
- Non-intrusive
- Faster and more repeatable than trial and error methods

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