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Single Cell In-Situ Extraction with Intact 3D Morphology from Formalin Fixed Paraffin Embedded (FFPE) Tissues

FFPE is a well-established and widely used method for preservation and histological analysis of tissue samples. DNA/RNA/and Proteins can be extracted from FFPE samples, but generally lack single cell resolution and completely lack 3D spatial resolution. Enabling 3D resolution allows the correlation of morphology to information like gene expression, which could illuminate disease mechanisms, treatment efficacies, and facilitate the move towards personalized medicine.

Researchers at the Biodesign Institute have developed a novel method and device for continuously extracting single/bulk cells and their contents from FFPE tissues. The cell(s) can be extracted in a high throughput manner while at the same time accurately relating the results to the spatial location of the cells in the tissue. This allows a researcher or physician to connect the single cell analytics back to the morphology of the patient's specimen and increases the overall quality of the collected material.

This system has the unique ability to integrate into both the research and clinical setting for disease and efficacy studies and advancing personalized medicine. It could also be a valuable tool for histological characterization of tumors and other tissue specimens.

Potential Applications

- Extracting single/bulk cells in formalin fixed paraffin embedded tissue for downstream analyses
 - DNA analysis
 - RNA analysis
 - Protein Analysis
- Enhanced histological characterization of tumors/tissue

Benefits and Advantages

- Enables continuous and sequential extraction of single cells directly above and below each other on an FFPE sample
- Does not require bulk tissue be disaggregated a priori
- Easily scale to high throughput
- Prevents bias in the analytical results

