System, Device, And Method For Biopsy Removal From Needles Into A Fluidic Device

This technology offers a method for removing core needle biopsy form a core sample needle. A millifluidic design retains orientation, shape, and structure of the tissue for consistent biopsy sampling and processing.

What is the Problem?

What is the problem?

To determine a diagnosis for various diseases, pathologists typically obtain biopsies from patients, which are first processed in large-scale pathology laboratories and then assessed after specimens are observed in two-dimensions (2D) through a microscope using white light. Thinly sectioned 2D core biopsies, which are chunks of biological tissue, contain the most information that best represents the in vivo condition of a disease state. However, 2D slides are inherently distorted and disorienting when observed by pathologists, hence significant tissue architectural information is lost. Three-dimensional (3D) imaging aids pathologists by providing an even more complete picture of the disease state, which promotes rapid on site evaluation and enhances diagnostic accuracy. However, manual handling of bulk biological tissue samples required for 3D imaging is difficult due to tissue viscoelasticity. Consequently, fixing, staining, and optical clearing of such biological tissue samples is inherently time intensive. These factors have been raised by clinicians as major limitations for the rapid processing and throughput of intact, 3D biological tissue samples to be used for diagnosis and study. Removal of these 3D samples often cause the biopsy to fold over itself, or be damaged by manipulation. There is a need for a 3D biopsy sample removal method that maintains the orientation, shape, and structure of the sample.

What is the Solution?

The solution is a milli-fluidic design which can work across all tissue types and a range of needle sizes to easily remove a core needle biopsy from the core sampling needle while retaining its orientation, shape, and structure. The design is automation friendly, works with sidecut and endcut biopsy needles and can be used to transport the biopsy to processing (staining, etc) and imaging chambers.

What is the Competitive Advantage?

Existing solutions methods of 3D biopsy removal result in the sample losing its original orientation, shape, and structure, limiting the usefulness of the sample for diagnosis. This

method maintains the original orientation, shape, and structure, allowing for consistent usages of 3D biopsy samples.

Patent Information:

WO2021102397A1

References

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