System and Method for Diagnostic Imaging of a Biopsy from a Coring Needle

This technology offers a rapid biopsy system for disease diagnosis using an inserted sheathed coring needle and a custom millifluidics chip. This biopsy can be removed and undamaged after tissue imaging.

What is the Problem?

Tissue removed from the human body is often a requirement for making a diagnosis of disease and determining its stage of progression. To preserve the living state of the tissue, the tissue is typically placed in chemical preservative within 3 to 5 minutes of being removed from the body. Handling of this vital tissue from biopsy device to imaging for disease diagnosis requires sample preparation procedures that require several manual steps in the process. A core needle biopsy (CNB) procedure is an example of a minimally-invasive method of removing vital tissue from the human body to determine if an area is cancerous. The rapid on-site evaluation (ROSE) for a CNB involves manually removing a small thread of tissue from a needle of 1-2 millimeters in diameter and touching and rolling it against a microscope slide to remove cells from the outer surface. This method is damaging to the CNB integrity for further downstream analysis. Currently, there is no clinical ROSE procedure that is not damaging to the biopsy.

What is the Solution?

The solution is a new biopsy system. This new system accepts an inserted sheathed coring needle into a custom millifluidics chip. The needle sheath is retracted to expose the tissue biopsy surface facing toward a flat clear surface for imaging by a microscope. The chamber can then be flooded with processing fluids that contain stains or die. The fluidic port can be oriented to the microscope and biopsy in any orientation. This enables the collection of a series of high-resolution surface images or 3D microscopy. After imaging, the biopsy can be removed, undamaged.

What is the Competitive Advantage?

Current cancer diagnosis requires hours to days of manual processing of tissue in a pathology lab. This solution enables rapid diagnosis of core needle biopsies without manual processing.

Patent Information:

WO2023107588A1

Technology ID

BDP 8657

Category

Device/Imaging
Selection of Available Technologies

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