Docket #: S20-435

'?Dicer' for Uniformly Sectioning Tissue Samples

Stanford researchers in The Tang Group have developed a reproducible, high throughput device that dices tissue into uniformly sized sub-millimeter sample fragments. Commonly used manual mincing (figure 1) produces samples of varying sizes (figure 3) with potentially unwanted variations in subsequent assays. The Tang Group's "?Dicer" (figure 2) quickly and reliably generates uniformly sized 100-300 ?m fragments. Researchers fabricated prototypes from 500-micron thick silicon wafers, and then tested the prototypes with soft material and tissue. Device optimization is ongoing, especially for dicing cancer tumors and other tissues, and capturing the fragments for spatial-omics research. Ultimately, the ?Dicer will facilitate tissue sample preparation for applications like genetic screening, drug screening, and spatial-omics.

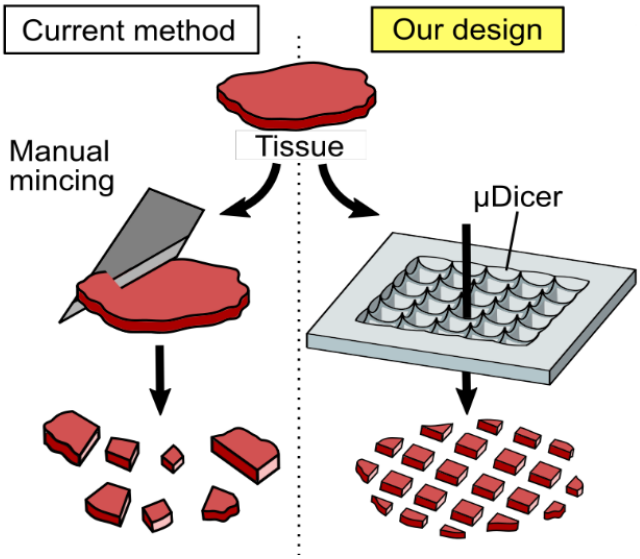


Figure 1 Schematic of manual mince (left), ?Dicer (right)
Image Courtesy The Tang Group

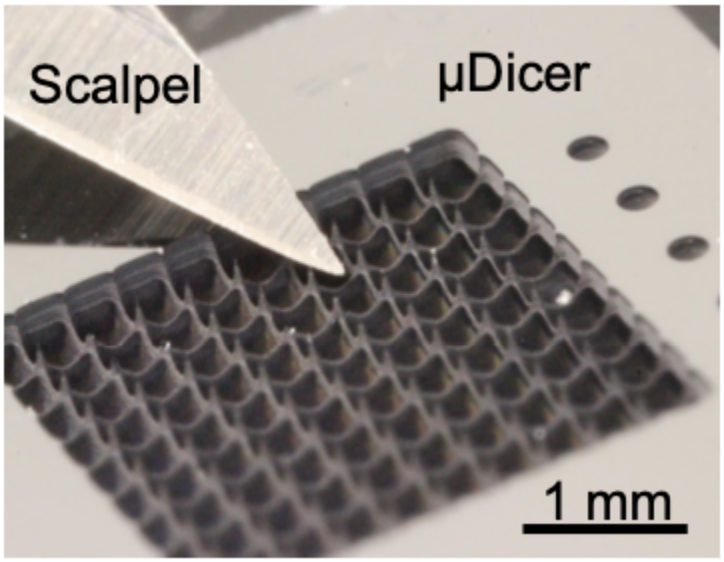


Figure 2 The ?Dicer next to #10 surgical scalpel commonly used for manual mincing.

Image Courtesy The Tang Group

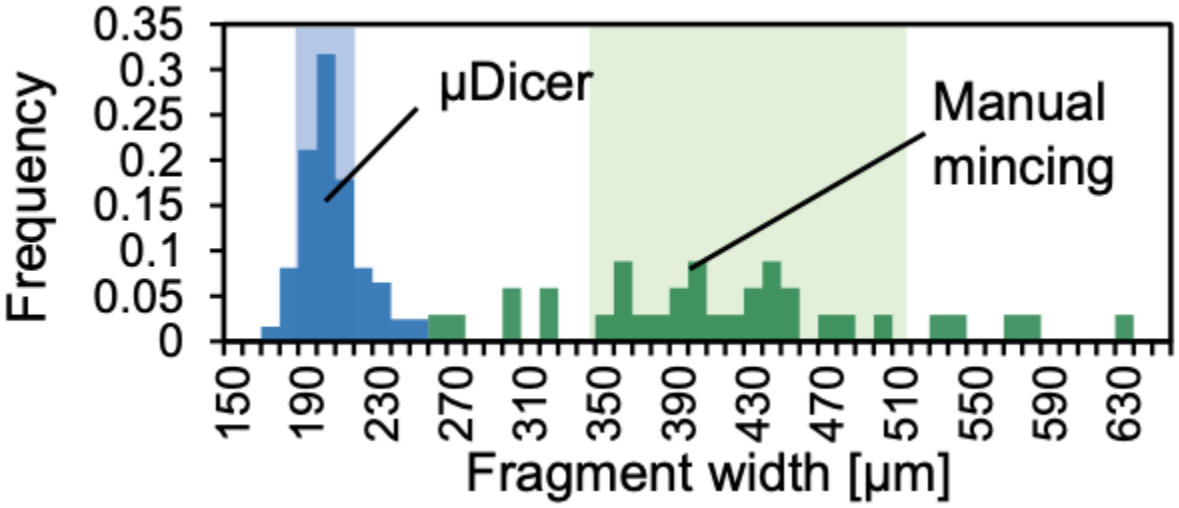


Figure 3 Mean fragment width dicing 5% agar manually and with a ?Dicer with an opening width of 195.75 ?m

Image Courtesy The Tang Group

Stage of Development – Prototype

Applications

- Biopsy tissue samples for drug and genetic screening
- Generating fragments for tissue culture studies
- Dicing tissue for spatial-omic studies of molecules, cell distributions within tissues, and location-specific gene expression
- Dicing soft materials into uniform fragments

Advantages

- Uniform submillimeter sample size (100-300 ?m)
- Accurate, reproducible, and repeatable
- High throughput, less time consuming

Publications

- Cordts, S. C., Castaño, N., Koppaka, S., & Tang, S. K. (2021). Fabrication of a silicon ? Dicer for uniform microdissection of tissue samples. *Applied Physics Letters*, 119(1), 011904.

Patents

- Published Application: 20220214249

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