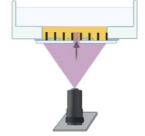


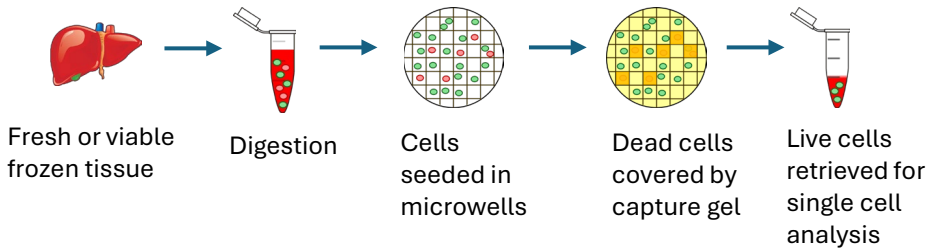


Live cell enrichment from tissue samples for Single-cell RNA seq analysis by Enrich TROVO system

Dissociating and isolating single live cells from tissue samples is an important step for basic and clinical research. Enrich TROVO exploits image-based automatic cell selection and capture to enrich live cells from digested tissue samples. Using light-induced microgel lithography, TROVO can create hydrogel microwells on tissue culture dishes and capture cells in microwells.



Simple process for preparing tissue samples for single cell analysis:



- From tissue to single live cell suspension, 4 hours for 3 samples
- Automatic dead cell selection and capture based on fluorescent signal analysis

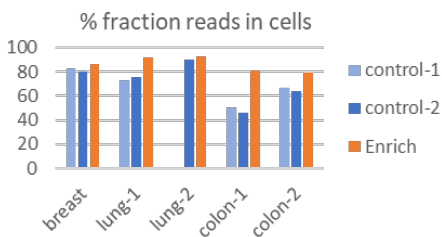
Current challenges in tissue sample processing for single cell analysis:

- Processing fresh tissue, especially fresh human tissue, is logistically difficult.
- Requiring $> 10^6$ cells dissociated from tissue for live cell purification, thus need big tissue size and long digestion.
- Cell sorting systems involving fluidics are at risk of clogging by cell clumps and debris.
- High pressure environment of FACS impairs cell viability.

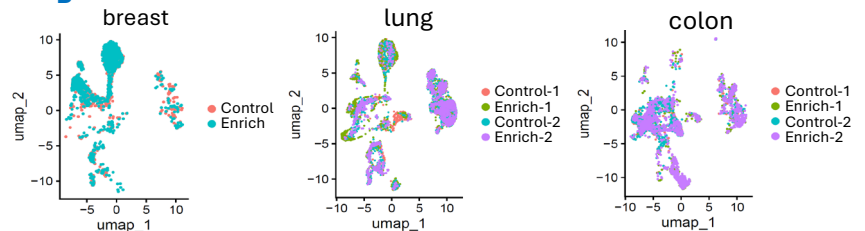
Enrich TROVO meets the need for tissue sample processing:

- Process fresh and viable frozen tissue: tissue collection and processing time is flexible, and batch processing is possible.
- Small sample size: 5mm piece of tissue; requiring only 10^4 cells dissociated from tissue for Enrich TROVO sorting, which enables short digestion time.
- Fluidics-free system: non-clogging, with high debris tolerance.
- Gentle for cells: low pressure, 4°C environment ensures high viability and intact transcriptome.
- Experimentally demonstrated to achieve higher % fraction reads in cells in 10X Genomics single-cell RNA seq compared to unenriched control, indicating a higher percentage of intact cells after live cell enrichment by Enrich TROVO.
- Tissue samples processed by TROVO allow the detection of multiple cell types and preserve tissue-specific cell features in 10X Genomics single-cell RNA seq.

A



B



Single cell RNA sequencing of frozen human tissue with (Enrich) or without (Control) live cell enrichment by Enrich TROVO:

A, % fraction reads in cells is higher in samples with live cell enrichment by Enrich TROVO in multiple tissues. B, cell clustering overlaps between Enrich and Control samples within the same tissue, and tissue-specific distribution is preserved in Enrich samples.