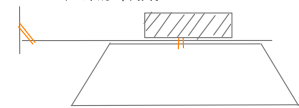


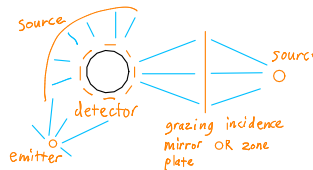
Bone removal end mill.  
Mechanical resistance may indicate soft rather than hard tissue, both while spanning and while stopped, with side and downward pressure regarded differently.



Vibrating or otherwise kinetic blade may achieve useful 2D cross section slices of whole brain.



X-Ray detection sphere. Differentially determines material density in all directions. Sudden changes reflect more local condition. With contrast agents, this allows identification of blood vessels, bone, etc. High dose rates are tolerable when the goal is in-vitro extraction, as cell multiplication may be controlled by mechanical confinement, and low yields may be acceptable.



Tritium perfusion emitter may be observable, if this is not immediately taken up by local cells (dubious).

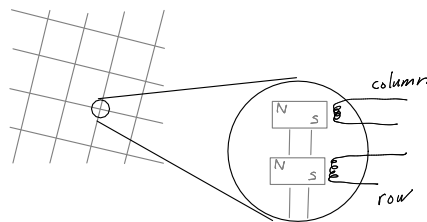
Continuous liquid flow across glass knife followed by valve trap allows slices to be isolated for automatic mechanical pickup and further processing.



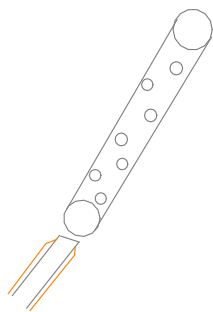
Microfluidic valve 'activeMatrix' (albeit arguably passive). Both row and column valves must be set open and fluid must be pressurized to allow flow.

Electromagnets shown may be entirely external to microfluidic device.

Not known to have any plausible biological production use.



Alternatively, a single valve may be powered by an electrical active matrix.

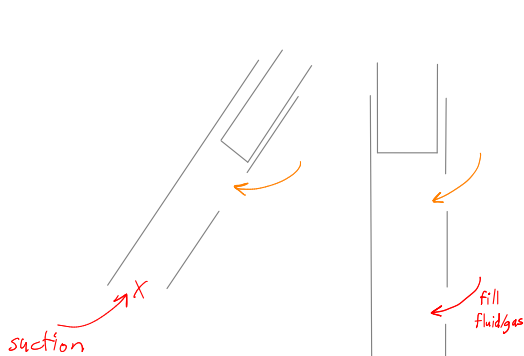


Bulk tissue, at the cost of some inflammation, may be interfaced by permanently embedded rigid tubing, confining collateral damage from repeated needle insertion.

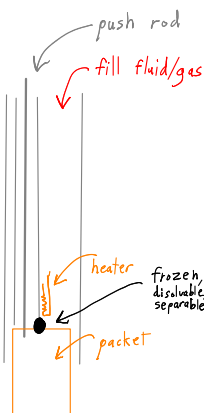
Minimizing collateral damage to nearby 'neuralBits' hardware (as opposed to protecting biological tissue), during routine protein or gene delivery (ie. for voltage sensitive dye) is the only obviously plausible use case.

Otherwise, other means are expected plausible in every plausible use case. Neural electrical interfacing may be done solid-state by permanent 'neuralBits' with no routine mechanical access. Fluid transfers are usually destined for voids where large pumps are highly tolerable if not far more desirable. Reconfiguration of neural networks is better facilitated by nondegradable scaffolding fabricated onto or adhered to 'neuralBits'.

Such permanent access corridors may require some kind of actuated door (eg. spring) to prevent cross-contamination (experiments with replicating transcription factors being particularly sensitive to unintended tissue being affected sooner than expected).



Single needle with side hole may be used as both pick-and-place, tool, minimizing non-friction collateral damage.



Fill fluid/gas may be pushed out as needle is withdrawn, minimizing collateral damage from undesired displacement suction.

