A Vertically Integrated System for Tracking and Assessing Cell-Cycle-Aware Phenotypes under Confinement

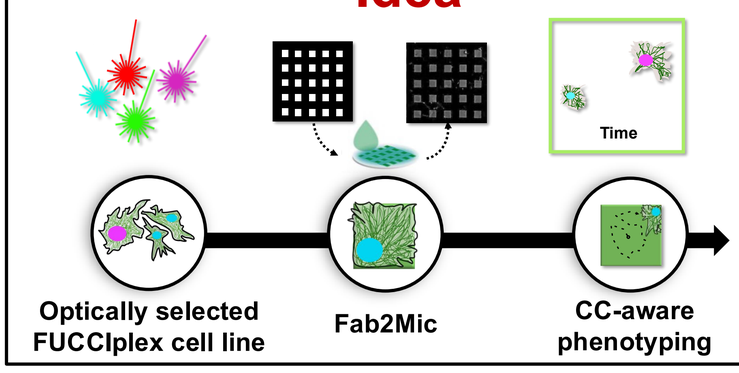
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Problem

- Live multiplexing is technically limited by fluorescent channel competition
- Confinement studies are still hard to run reproducibly at scale
- Standard assays usually separate migration from cell-cycle readouts

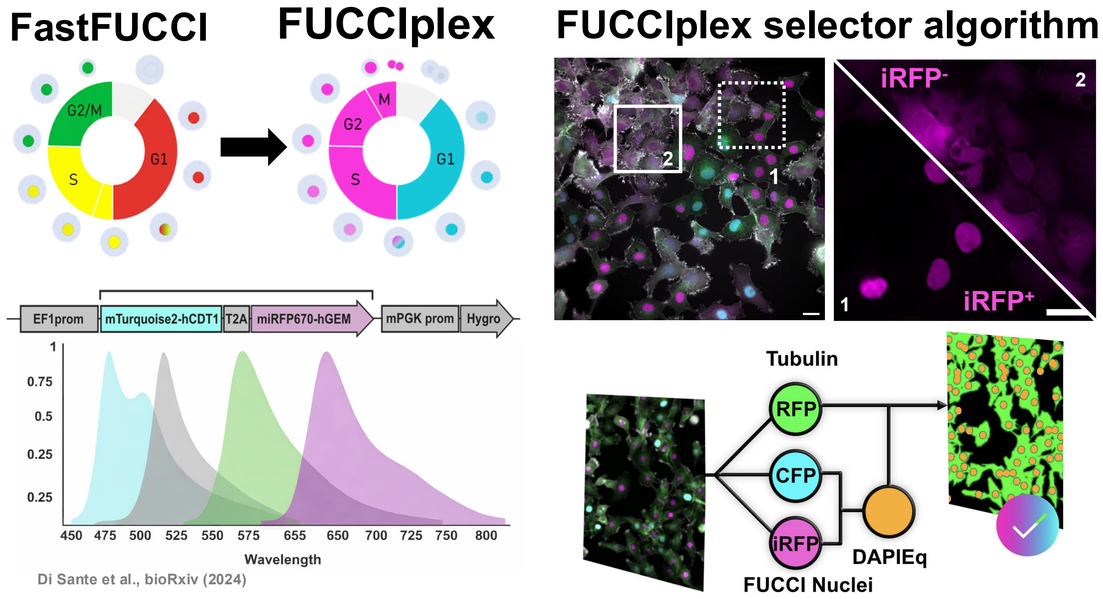
Idea



Plan

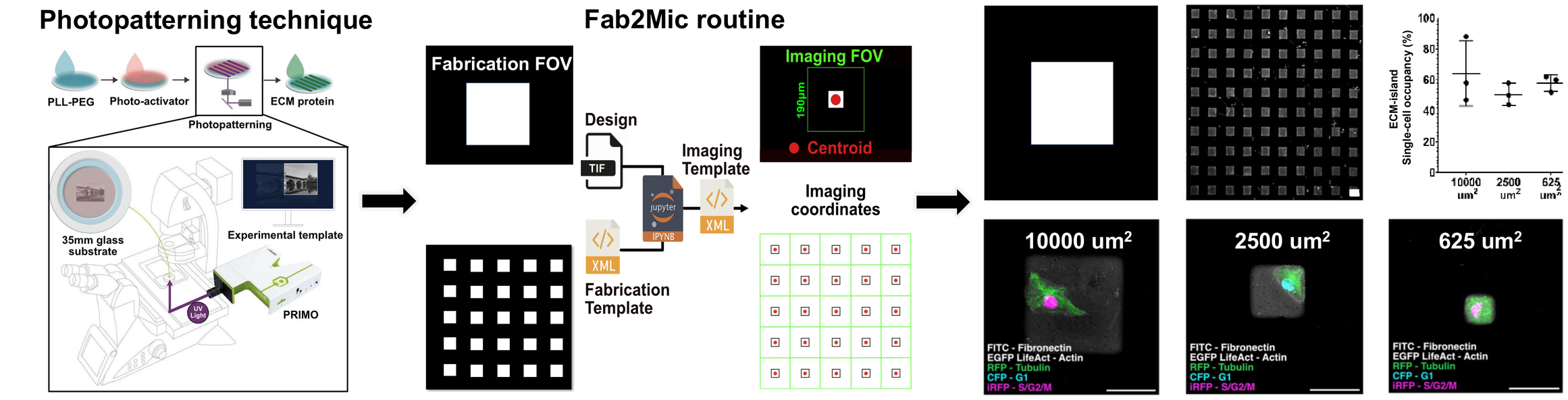
- FUCCIplex HT1080 editing and optical selection
- Link fabrication layouts to microscopy coordinates
- CC-aware phenotyping under confinement

HT1080 FUCCIplex cell line

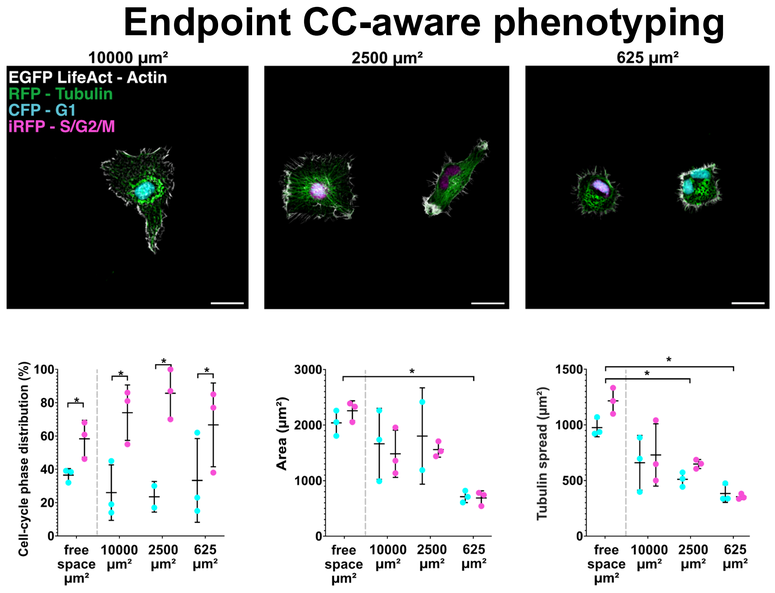


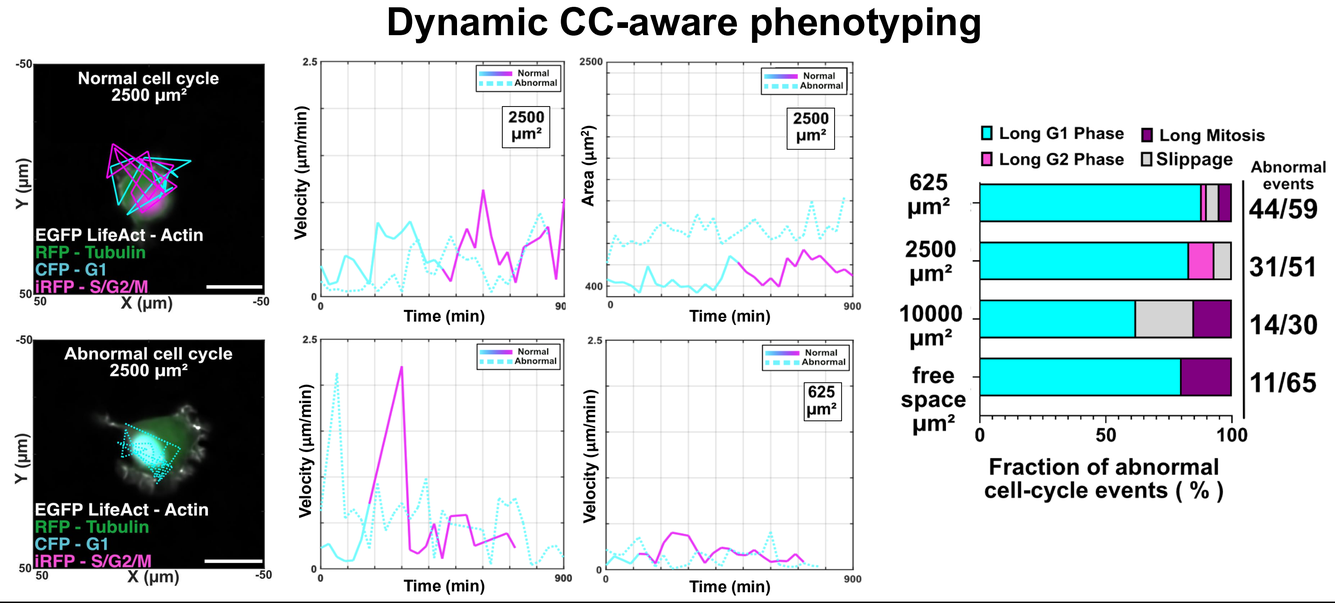
Di Sante et al., bioRxiv (2024)

Fab2Mic



CC-aware phenotypes under confinement



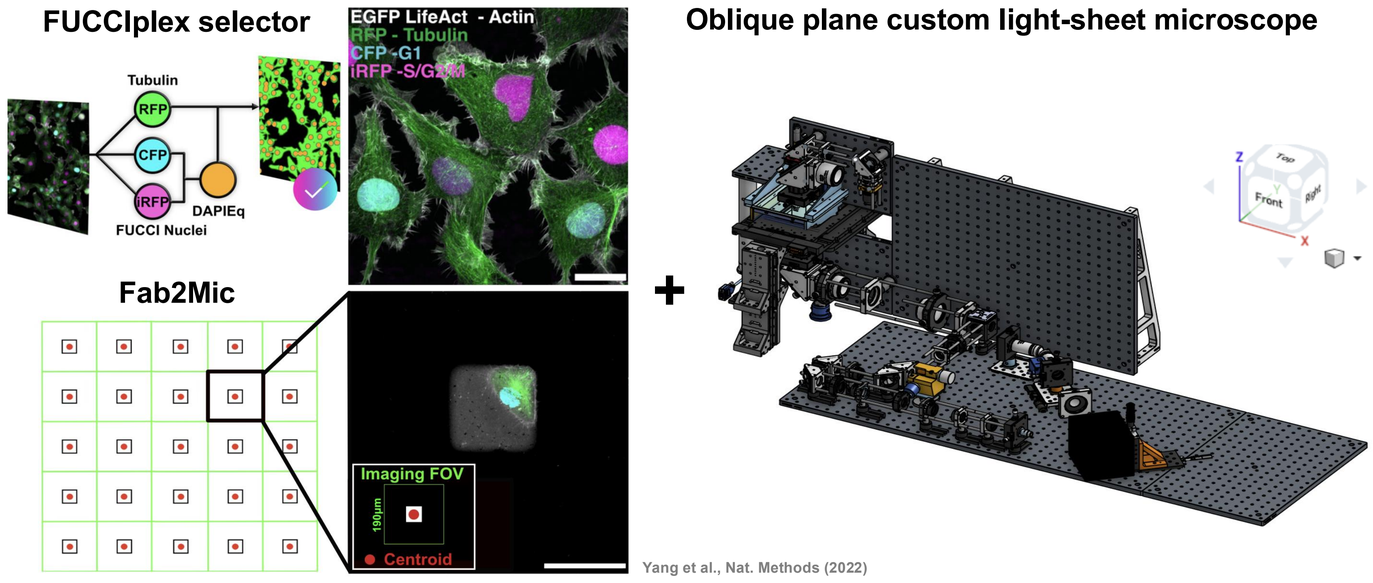


Conclusions and future directions

- Optically selected migratory **HT1080 FUCCIplex** edited line enables CC-aware motility and morphology studies
- **Fab2Mic** directly links fabrication layout to microscopy acquisition coordinates
- **Dynamic CC-aware phenotyping** uncovers abnormal cell-cycle progression under different grades of planar confinement

Future directions

Structural and functional CC-aware 3D phenotyping in engineered microenvironments



Yang et al., Nat. Methods (2022)

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