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題目: Pushing the spatiotemporal resolution in 3D live imaging



**Challenges**

- Samples are alive and dynamic
- High 3-D resolution is desired
- Limited photon budget
- Aberration

**Bessel Beam Plane Illumination: Swept Sheet Mode**

actomyosin contractions precede initial gastrulation of *C. elegans* embryo

local Wnt source induces oriented stem cell division and different cell fates

S.J. Habibi, et al., *Science* 339, 1445 (2013)

M. Roh-Johnson, et al., *Science* 335, 1232 (2012)  
w/ Chris Higgins, Bob Goldstein, UNC

T. Mancho, L. Gao, et al., *Nat. Methods* 8, 417 (2011)

**Multi-Bessel Structured Plane Illumination**

seven parallel Bessel beams with DOE

membrane ruffling and vacuole trafficking, COS-7 cell

L. Gao, et al., *Cell* 151, 1370 (2012)

- larger fields of view
- faster imaging
- reduced photodamage



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