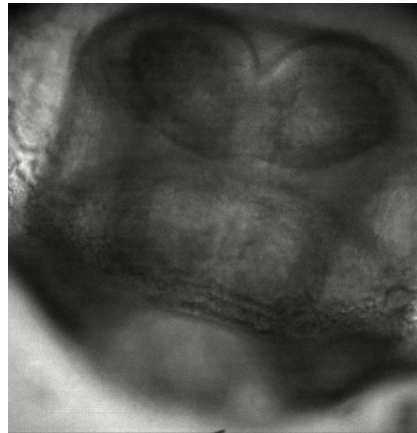


Visualising early mammalian development with light sheet microscopy



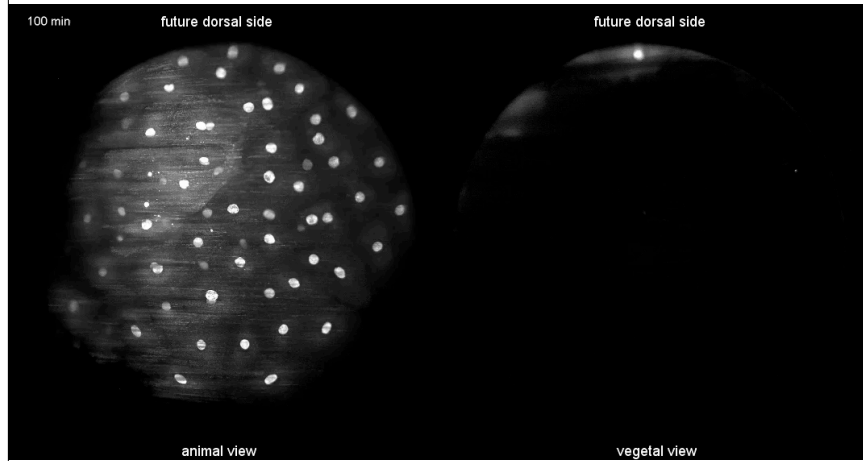
Shankar Srinivas

Physiology Anatomy & Genetics
University of Oxford



1

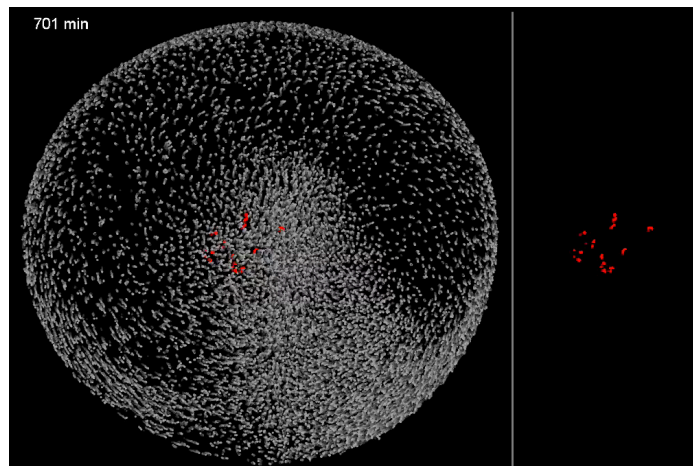
Light sheet microscopy – eye candy



Keller et al. 2008

2

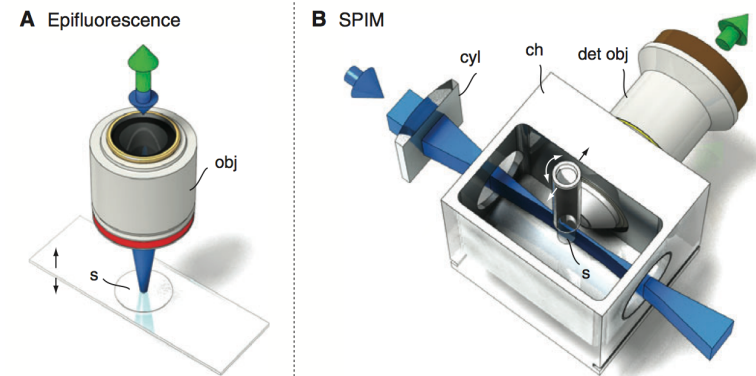
Light sheet microscopy – eye candy



Keller et al. 2008

3

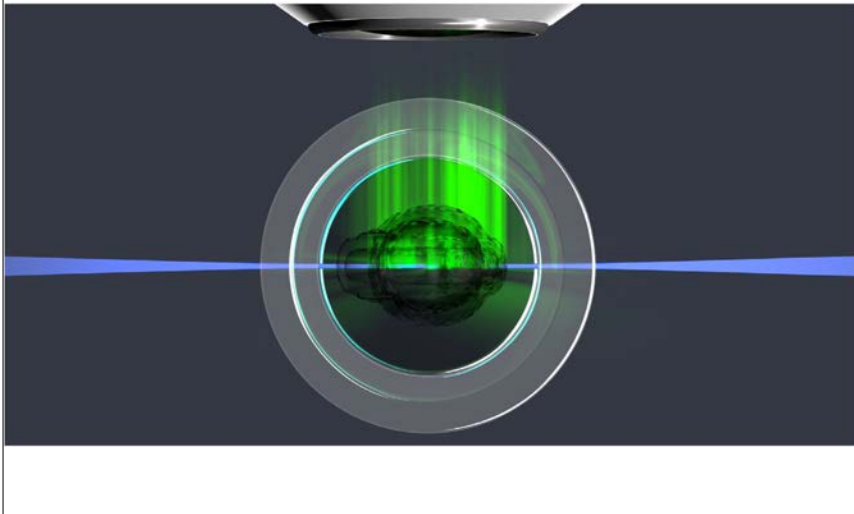
Light sheet microscopy – the basics



Huisken and Stainier 2009

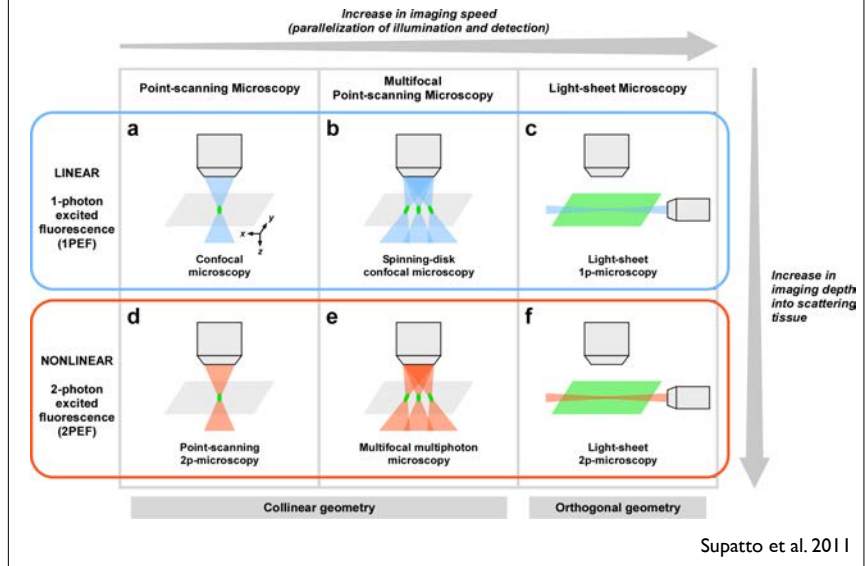
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Light sheet microscopy – the basics



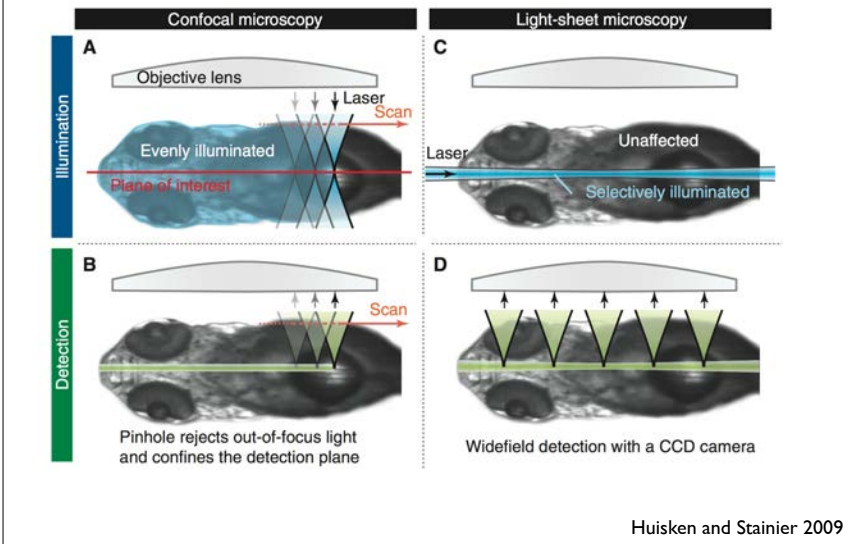
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Faster and less damaging



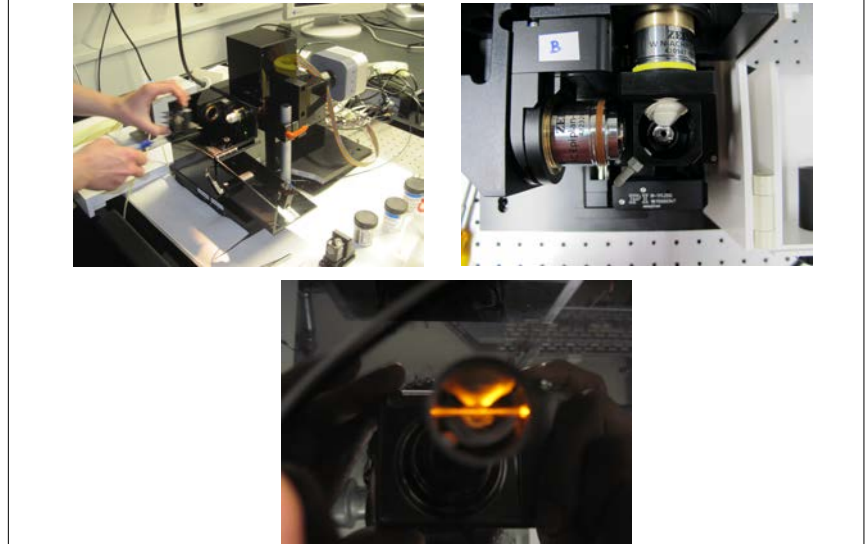
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Faster and less damaging



7

Stelzer mDSL



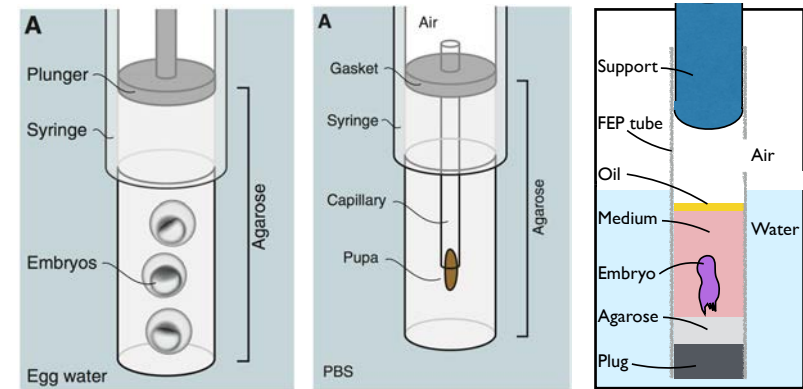
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Lightsheet Z1



9

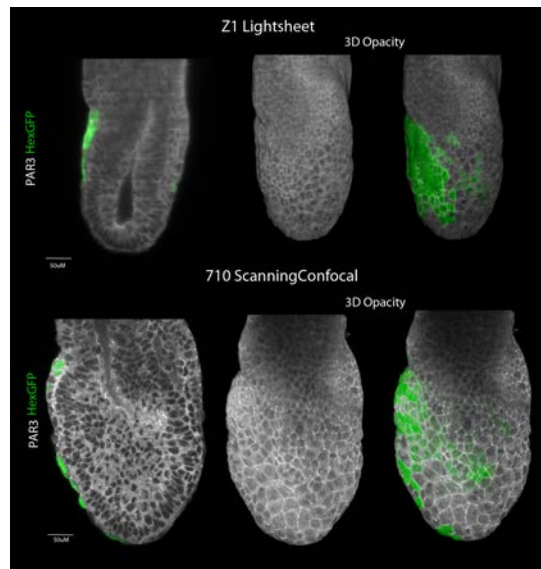
Sample presentation



Huisken and Stainier 2009

10

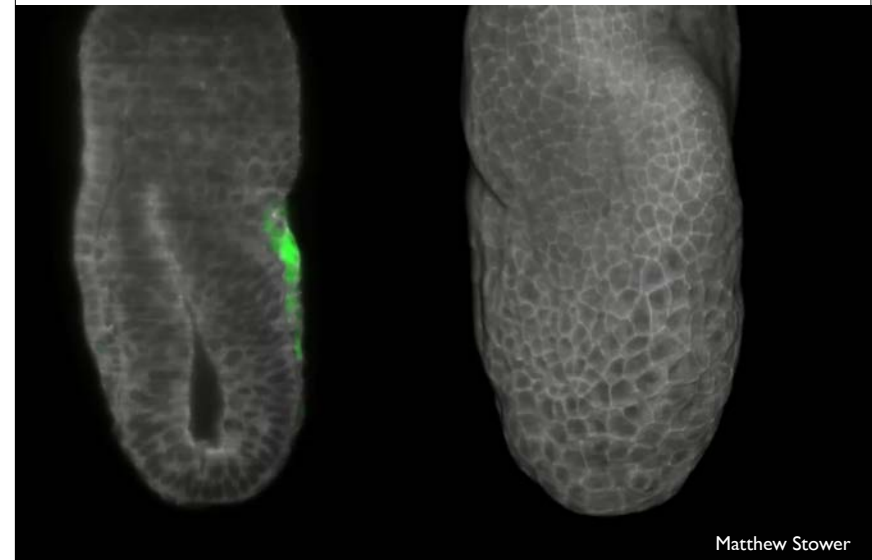
Z1 compared to 710



- 256 sections
- 1 μ m interval
- Exp 29.97ms
- 1x zoom
- lightsheet 4.56 μ m thick
- acquisition <40s
- laser: 488 & 561
- dual side illumination

Matthew Stower

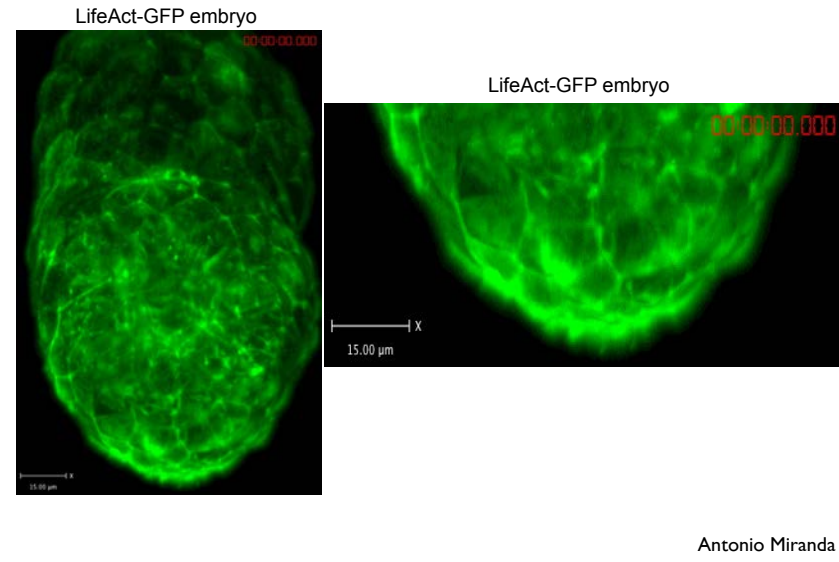
11



Matthew Stower

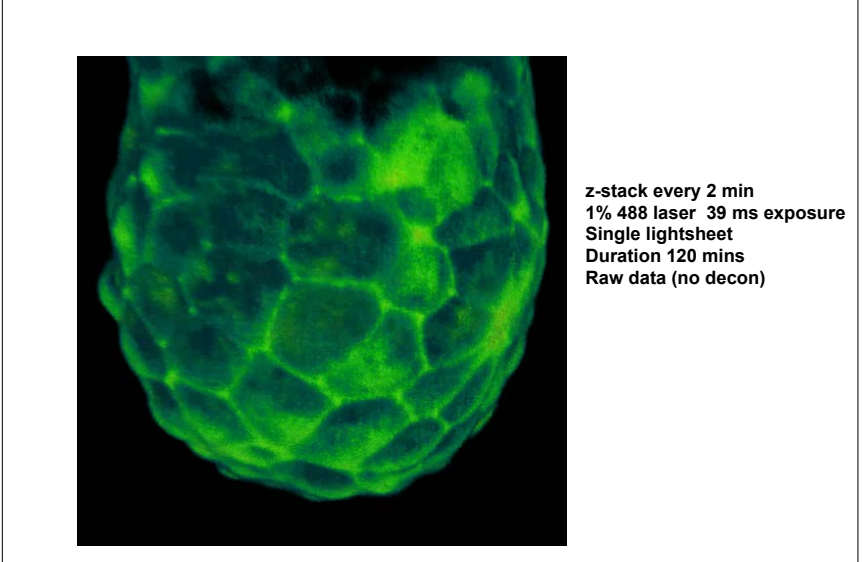
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Apical projections from VE cells



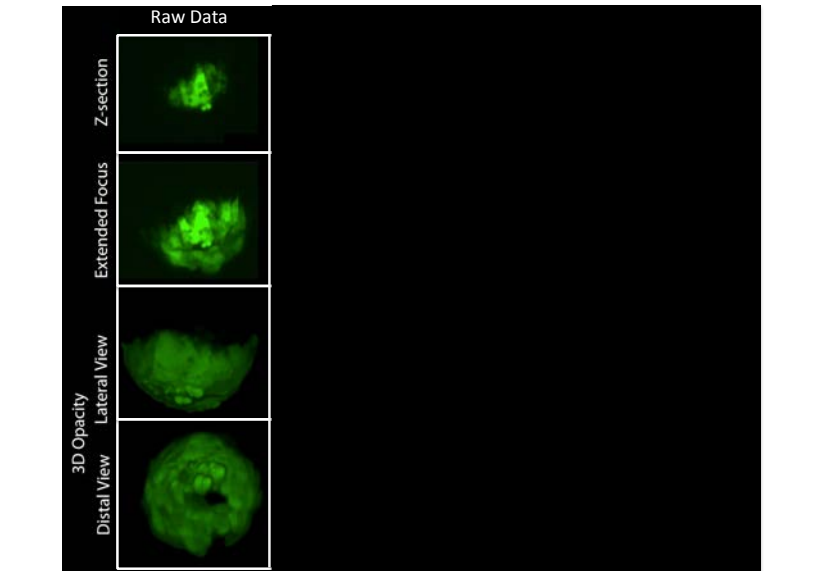
13

Cell shape and actin dynamics during migration



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Deconvolution

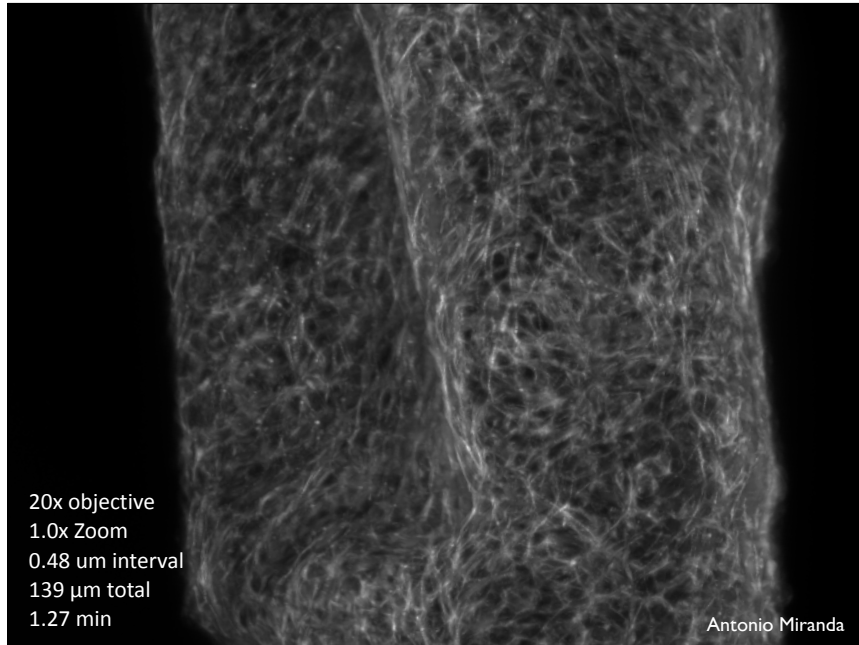


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Large field of view



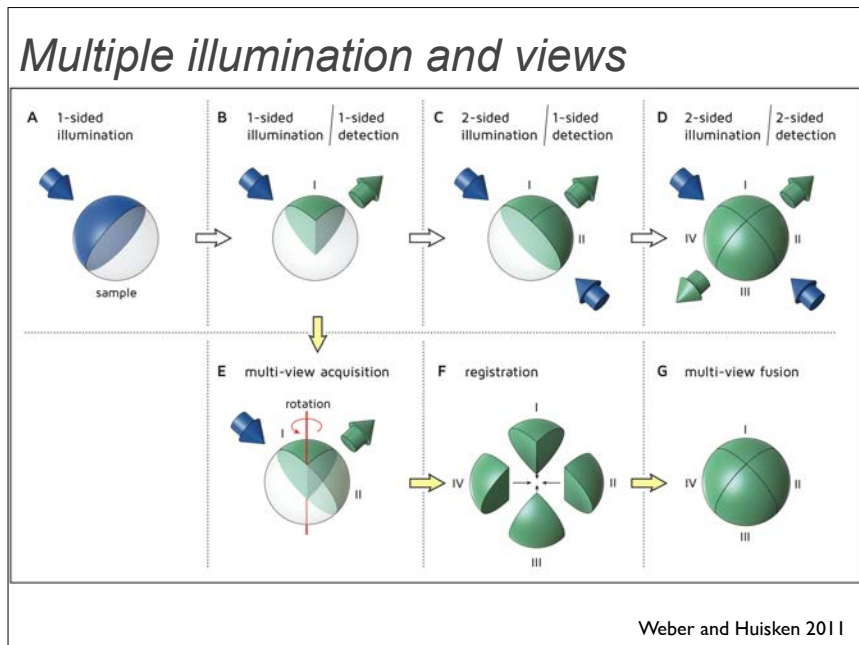
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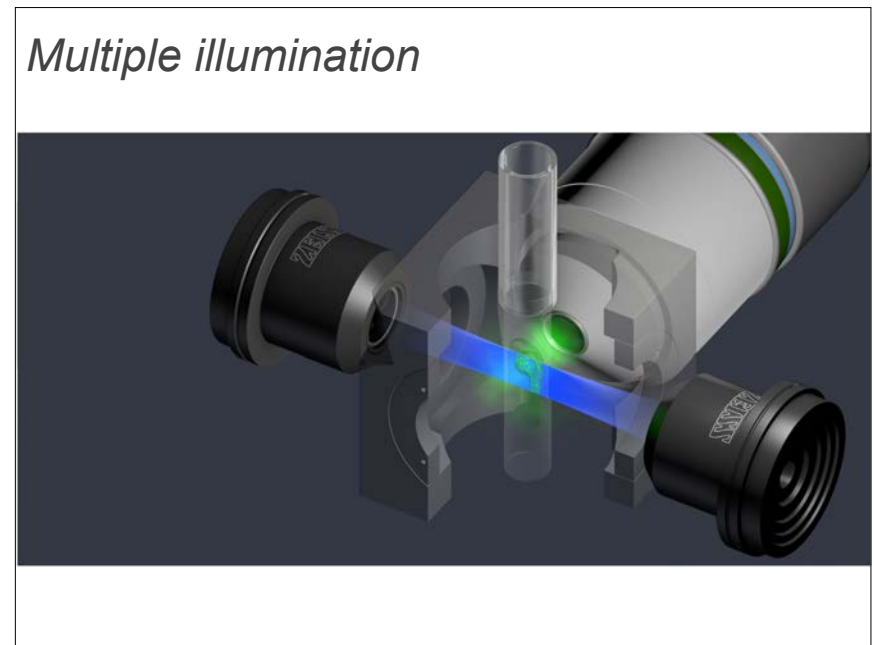
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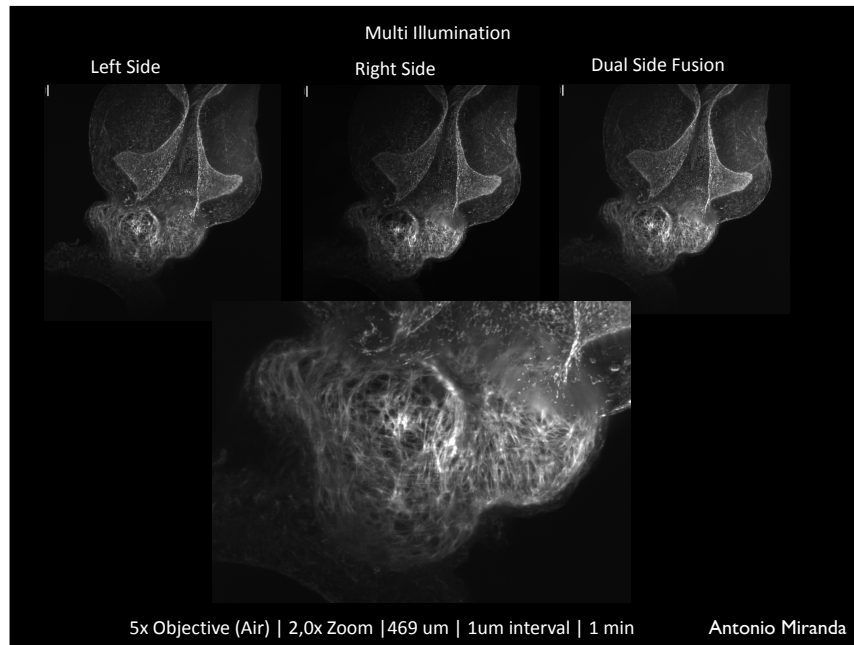
18



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Major challenges

- Further optimise mouse embryo mounting
- Image processing – terabytes of data
- Automated segmentation
- Data visualisation

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Acknowledgments

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Eva Wegel		
Ilan Davis		

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