

# OME Paris

June 2012

Inspiring application of OMERO  
– a case study

Dr Steve Rawsthorne  
John Innes Centre



# Acknowledgements



Jerome  
Avondo

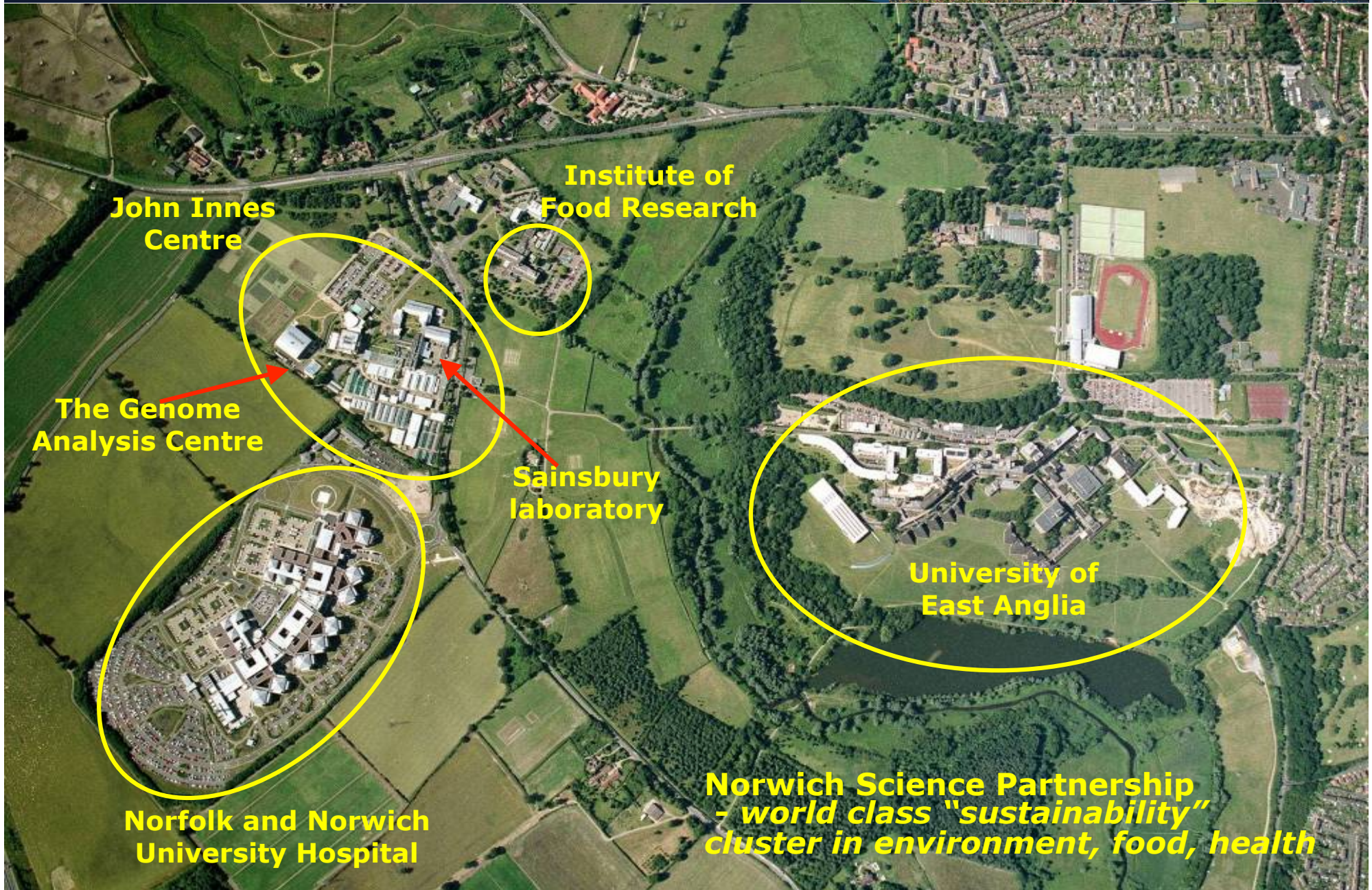


Paul  
Fretter

The OMERO Team – Jason Swedlow  
UEA  
JISC – Simon Hodson  
BBSRC

Sam Fox (Coen Lab)  
Grant Calder (JIC BioImaging)

# Context - Norwich Research Park



# Role – Why am I here?



“Build it and  
they will come”



# Role – Why am I here?



- Science Operations Manager
- I could see a potential project
  - Enhancement of the Scientific Process
  - Data Management
  - Data Storage
  - Quality Assurance

# The Project.....



# Data Management (*for*) BioImaging

JISC

# DMBI – the foundations



- JISC funding to BBSRC
- Project area
  - Rico Coen lab – world leading research group
  - Bio-Imaging platform
  - Data output, storage and exchange
  - Receptive environment for change

# DMBI – the players



- Jerome Avondo\* (computational scientist)
- Paul Fretter\* (Computing Dept – systems)
- Grant Calder (JIC bio-imaging specialist)
- Sam Bean (QA specialist)
- Rico Coen (JIC Project Leader – developmental biologist)
- Andrew Bangham (UEA computational scientist – mathematical modelling of development)
- Steve Rawsthorne (JIC Science Operations)



# Our aims in DMBI



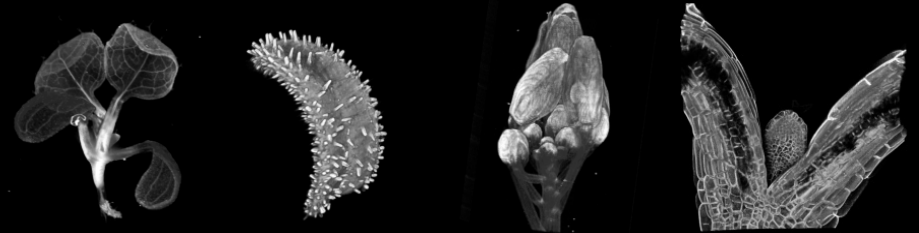
To identify opportunities to:

- improve users day-to-day working environment
  - Data capture and throughput
  - Data storage and organisation
  - Pipelines to improve efficiency
  - Single software platform
- improve institute computing architecture and storage efficiency
  - Server and fileshare architecture
  - (OMERO) Server-side access to High Performance Compute Cluster
  - Server-side access to GP-GPU processors (NVidia Tesla)
- improve quality assurance
  - Reusability
  - Clarity of ownership
  - Funding body data policies

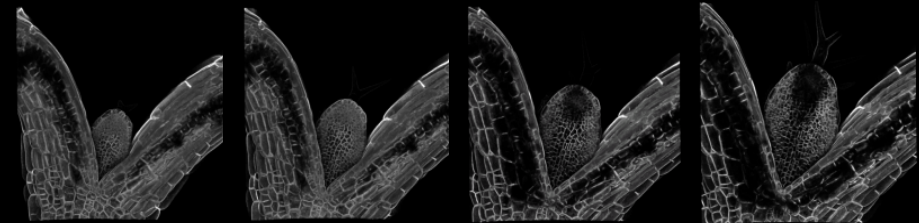
# Bio-Images – 5D



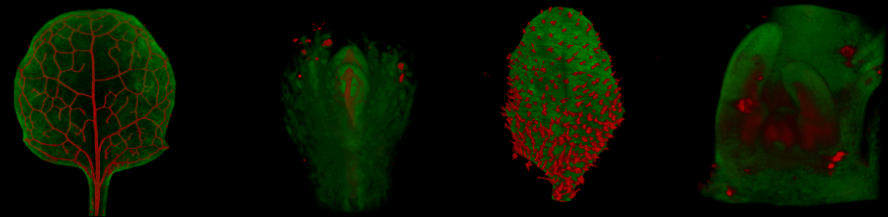
- Spatial



- Temporal



- Spectral / Channels



# Image data basics

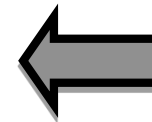
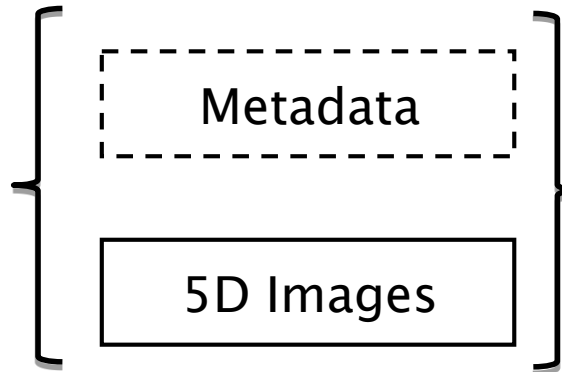
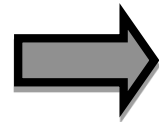


- Data Capturing
  - Resolution, timesteps, wavelengths, ...
- Visualisation
  - Projections, thresholding, contrast, ...
- Quantitative Analysis
  - Segmentation, measurements, ...

# User and designer needs?



How do we manage all this information?

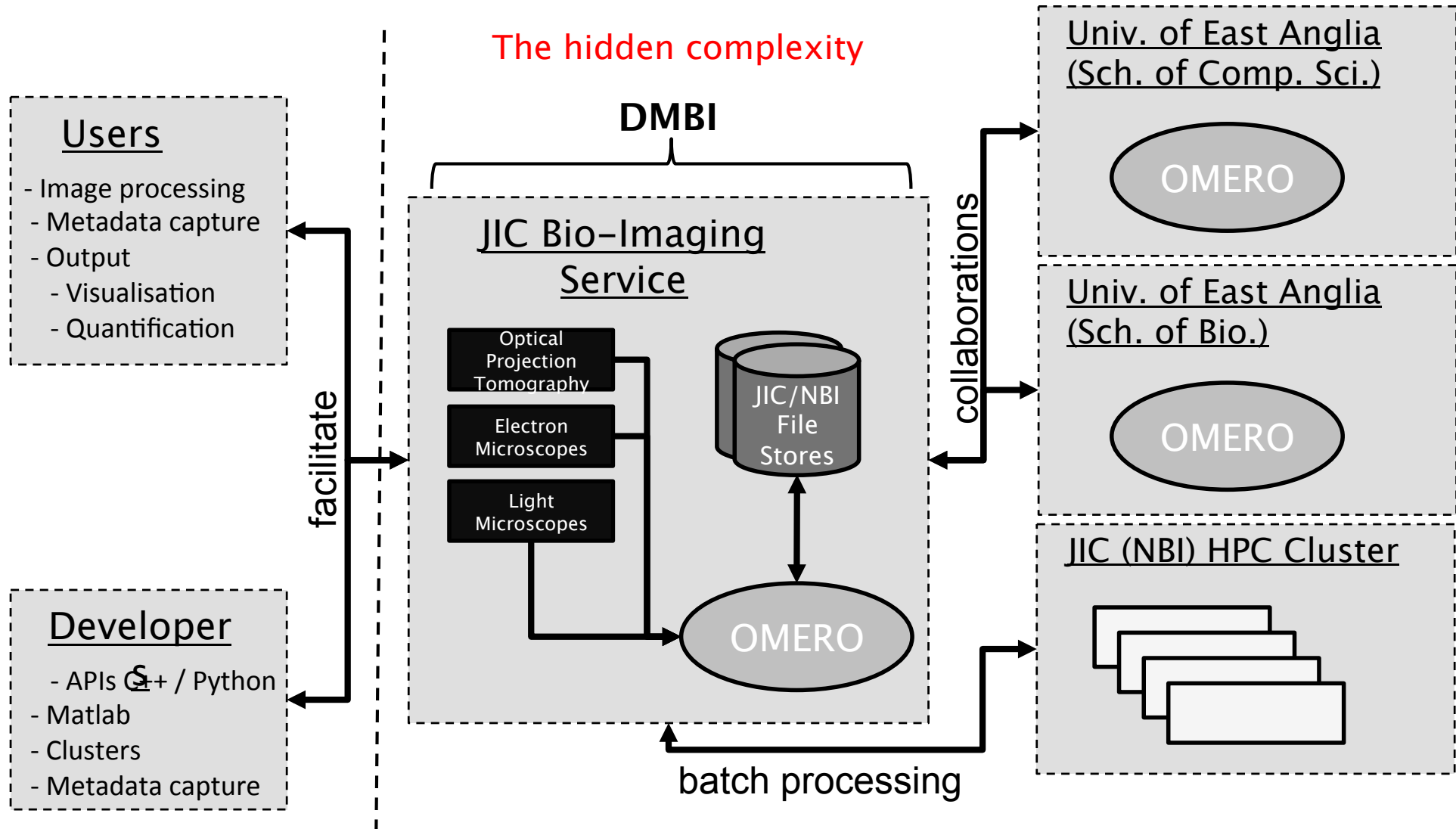


How do we promote successful interaction with this data?

**Open Microscopy Environment**



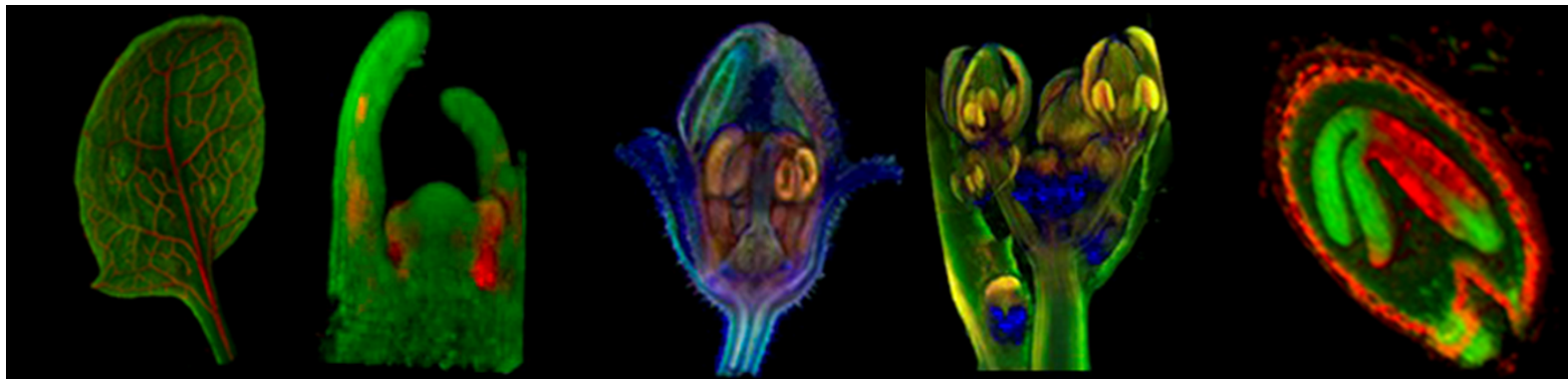
# Challenge and Vision



# Outputs 1



- Enhanced and robust data management plans
- A prototype DMBI system around OMERO
- Strengthened links between images, software and results
- DMBI has improved interactions:
  - Biologists and image processing (at least getting there!)
  - Developers and bio-images
  - JIC and collaborators



# Outputs 2



- Increased understanding how the responsibilities for storing and caring for experimental data can be divided
- Developed (prototype) standard data management and processing pipeline schemes and templates
- Provided an indication of the level and cost of staff resources
- Workshops for Imaging Community

**2012 Plant Systems Biology UK Workshop**  
John Innes Centre, Norwich  
20<sup>th</sup> April

Including workshops on data management and future funding strategies

Speakers to Include:

Andrew Bangham	University of East Anglia
Malcolm Bennett	University of Nottingham
Jim Beynon	University of Warwick
David Fell	Oxford Brookes University
Martin Howard	John Innes Centre
Ottoline Leyser	Sainsbury Laboratory Cambridge
Andrew Miller	University of Edinburgh
Steve Penfield	University of Exeter
Chris Rawlings	Rothamsted Research

To register click the Plant Systems Biology tab at <http://plantsci2012.org.uk>

John Innes Centre BBSRC EMC PROACT



# Outcomes



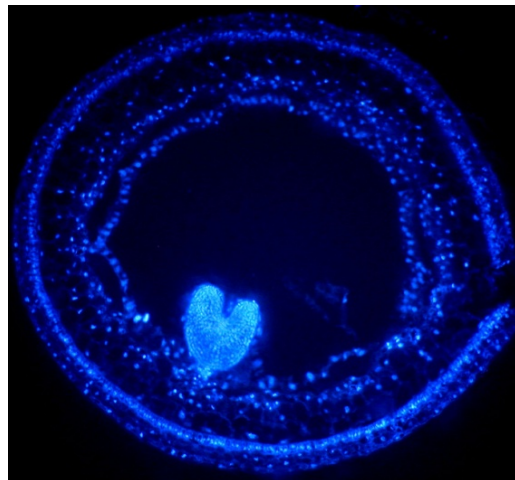
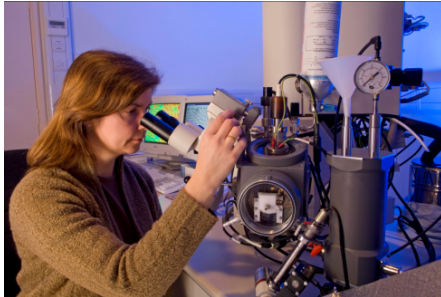
- This project has catalysed further work both in JIC/BBSRC/NRP and the wider BioImaging community
  - 5 new user groups on NRP
- Contributed to OMERO development
  - VolViewer and ongoing user feedback
- Increased Community awareness and skills
  - Workshop training materials on-line
- Exportable image processing pipelines implemented
  - Good news for all.....



# ...what next???



- User feedback continues to identify how developer and user interactions could be further enhanced
  - Embedded developers is a big key here
  - Facilities with lots of users, varied platforms and enthusiasm should be used as exemplars for this



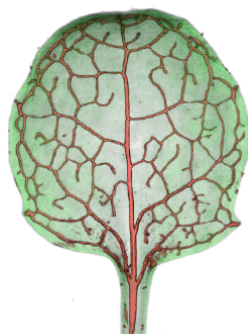
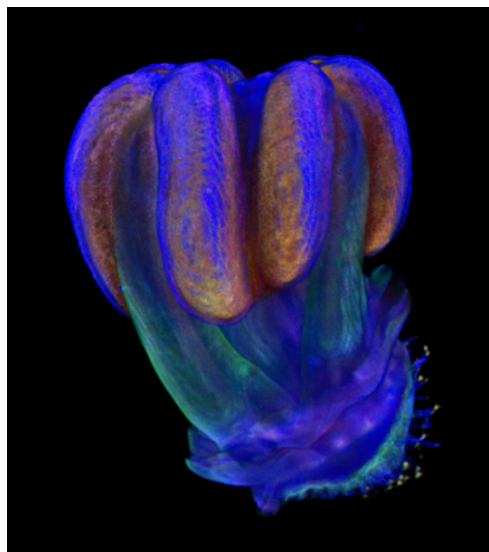
# ...what next???



- Advocacy/championing still required
  - if it works users will follow!
  - how can we make it work (better)?? e.g. context of the experiment
- Resourcing in systems and expert users to train others
  - management needs to recognise costs and plan
- How to do the training?
  - training the trainers and embed in culture

.....the journey continues!





Thank you!

