
BiolmagingUK & Euro-Biolmaging
Towards a world-class, open, shared,
accessible imaging infrastructure

Jason Swedlow
University of Dundee

EPSRC Town Hall Meeting
April 9, 2014

Talk Outline

BioImagingUK

- What is it?
- 2012 Strategy Meeting
- 2013 Activities

Euro-BioImaging

- Goals & Mission
- Summary of 2010 – 2013 Preparatory Phase

Strategic Community-driven Scientific Infrastructure

UK Science– World Leading & Growing

World-leading UK research

- £3bn invested p.a. in UK research

2011 BIS Report

- International Comparative Performance of the UK
- “The UK’s share of the world’s top 1% of most highly cited papers, which indicates its share of the highest quality published research, was 13.8% in 2010, 2nd only to the US. “
- “The UK’s field-weighted citation impact, an indicator of quality is 2nd only to and closing in on the US... [w]ithin the UK, its constituent countries reflect the UK’s overall positive trend in field-weighted citation “

Biological & Medical Imaging– Strategic Investment

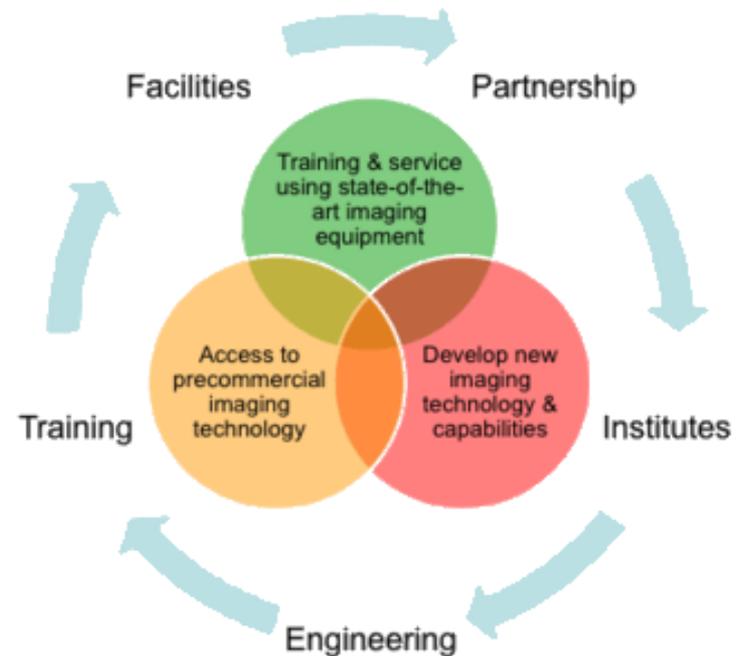
Major investments in biological & medical imaging

- EPSRC Medical Imaging :
Current Grant Portfolio (2011): £79M
MRC & NIHR: ~ £75M
- Wellcome Trust Brain Imaging:
2% of total funding 1990 – 2009
- EPSRC/CRUK Cancer Imaging:
£50M 2008 – 2013
Cancer Imaging Initiative 2013 - ??
- MRC/BBSRC/EPSRC (2012)
Next Generation Optical Microscopy: £25M
- RCUK Framework for Capital Investment

Total investment hard to quantify, so strategic impact analysis difficult

Aims & Activities

1. To **develop and exploit new imaging technologies**– driving development of and access to state-of-the-art imaging instrumentation.
2. To devise and help implement mechanisms to enable **shared access to the general and specialized expertise** based in life sciences imaging laboratories and facilities throughout the UK.
3. To engage our departments, universities, and funding bodies to develop **career models for the personnel** that develop, maintain, and enable advanced imaging technology for the life sciences.
4. To define **new training programmes**, to provide the foundation for the next advances in life sciences imaging within the UK.
5. To work inclusively to define short and long-term strategy statements to our research funding bodies, in order to help **articulate funding requirements and priorities**.



<http://bioimaginguk.org> (see *Meetings, Working Groups & Documents*)

Unfunded, grassroots consortium of imaging scientists

Meetings Page

Meetings of interest to the BiolmagingUK Community

in reverse chronological order

■ 6th UK Facility Manager Meeting Jan 6-7 2014

- Organiser: [Michelle Peckham](#)
- Registration [Form](#). **NOW CLOSED**
- Meeting [Info](#)
- Provisional Programme ([PDF](#))
- Location: Conference Auditorium, University of Leeds. [GMaps](#) or University of Leeds Map ([PDF](#)); The Meeting Page at rms.org.uk has lots of great tips for getting to the meeting.

■ Euro-Biolmaging Stakeholders Meeting, Heidelberg, Nov 25-26, 2013

- Meeting [Info](#)
- Registration [Form](#)
- Meeting Agenda ([PDF](#))
- Presentations from the Meeting
 - Status Report-- Oliver Speck ([PDF](#))
 - Access Examples-- Karsten Specht and Judith Klumperman ([PDF](#))
 - Infrastructure Access Model-- John Eriksson ([PDF](#))
 - The Euro-Biolmaging Hub and Node Model and its Governance Structure- Antje Keppler ([PDF](#))
 - The Euro-Biolmaging 1st Open Call for Nodes - Pamela Zolda ([PDF](#))
 - Achievements of Euro-Biolmaging Preparatory Phase ([PDF](#))
 - Next steps towards construction - Benny Geiger ([PDF](#))
 - ESFRI Research Infrastructures and Horizon 2020- Ann Uustalu (European Commission) ([PDF](#))
 - Break-out session Medical Imaging- Aad van der Lugt ([PDF](#))

<http://bioimaginguk.org> (Click on *Meetings*)

BioImagingUK Community

Organising Committee

- Jason Swedlow (Dundee)
- Paul French (Imperial)
- Kurt Andersen (Beatson)
- Nick Long (Imperial)
- Tony Gee (Kings)
- Lucy Collinson (LRI/CRUK)
- David Hawkes (UCL)
- Paul Verkade (Bristol)
- Patrick Hussey (Durham)

BioImagingUK Strategy Meeting

A UK Roadmap for Imaging?

Wellcome Trust, Euston Road

July 2-3, 2012



Why a Strategy Meeting (I)?

Current Success/Future Delivery

Overall Goal: deliver the best, most important, most effective science possible, given the available investment

Technology needed to deliver this science must be the best, most appropriate for the scientific goals & needs.

The status quo (largely) delivers: UK delivers highest research metric/investment

Looking to the Future:

Over the next 10 years, how do we deliver research imaging technology in UK?

- provide necessary infrastructure to underpin world-class science
- keep pace with growing complexity & costs
(equipment, personnel & tech development)

- I. *Bioimaging facilities*** are needed in the UK – including National Facilities, Centres of Excellence, and, critically, Department or Institute level facilities. These serve different complementary roles and an active, world-class, scientific infrastructure requires multiple levels to be developed and sustained.
- II. *Training programmes*** that cover all aspects of bioimaging - EM, optical, ultrasound, X-ray CT, MRI, PET/SPECT, detector technology, probe development, image processing and analysis, modeling, and data management - are the foundation for continued world class performance of UK science. Training programmes that build a sustainable pool of scientific and technical talent must be developed and, for at least some fields, coordinated on regional or national levels.
- III. *Career structures and opportunities*** for bioimaging staff must be developed, to nurture and sustain the critical expertise needed to design, build, run and further develop bioimaging infrastructure and technologies.

BioImaging on the UK Strategic Roadmap

RCUK Framework for Capital Investment 2012:

“There are many exciting new advances in the complementary imaging technologies...[a] national programme of infrastructure investment is needed to establish national capability in these next generation technologies to maintain the UK at the scientific cutting edge. *Bioimaging UK is one example of an investment for a distributed bioimaging infrastructure proposal that will provide the latest technologies in distributed technical hubs for academic and industrial collaborative access, with an underpinning open-access data repository to enable comparative studies and generate research efficiencies.*”

(emphasis added)

BiolmagingUK– 2013 Activities

Meeting with RCUK & Wellcome Trust:

- Paul French & Jason Swedlow, March 15, 2013
- Strategy Meeting and Summary very important
- Appearance on RCUK Capital Framework a major step
- Articulation of an open grassroots community vision critical and unique
- MRC/BBSRC/EPSRC Next Gen outcomes recognised “community” concept

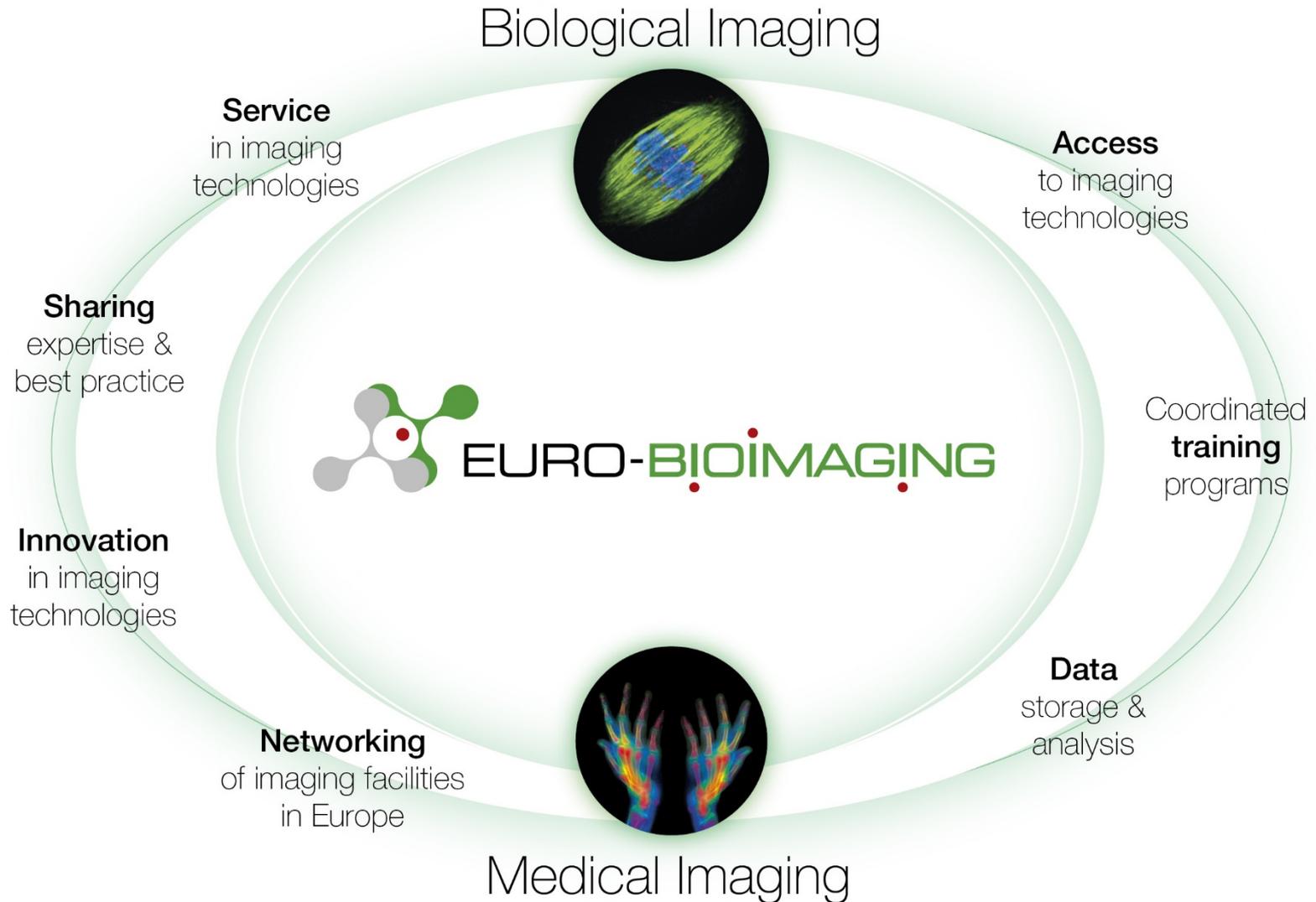
Euro-Biolmaging Node EoI Call

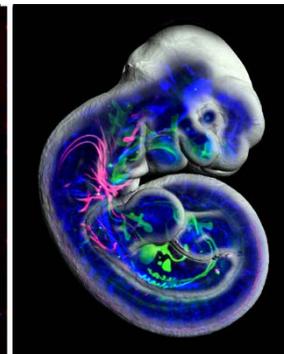
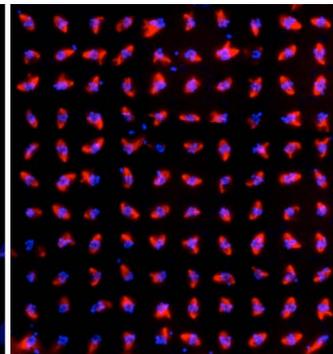
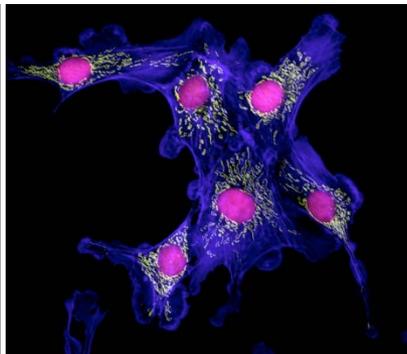
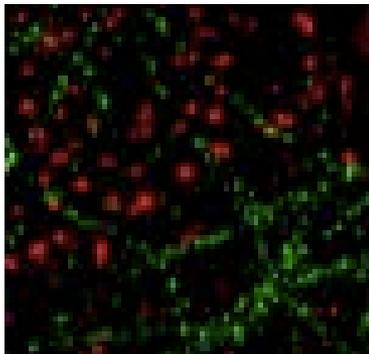
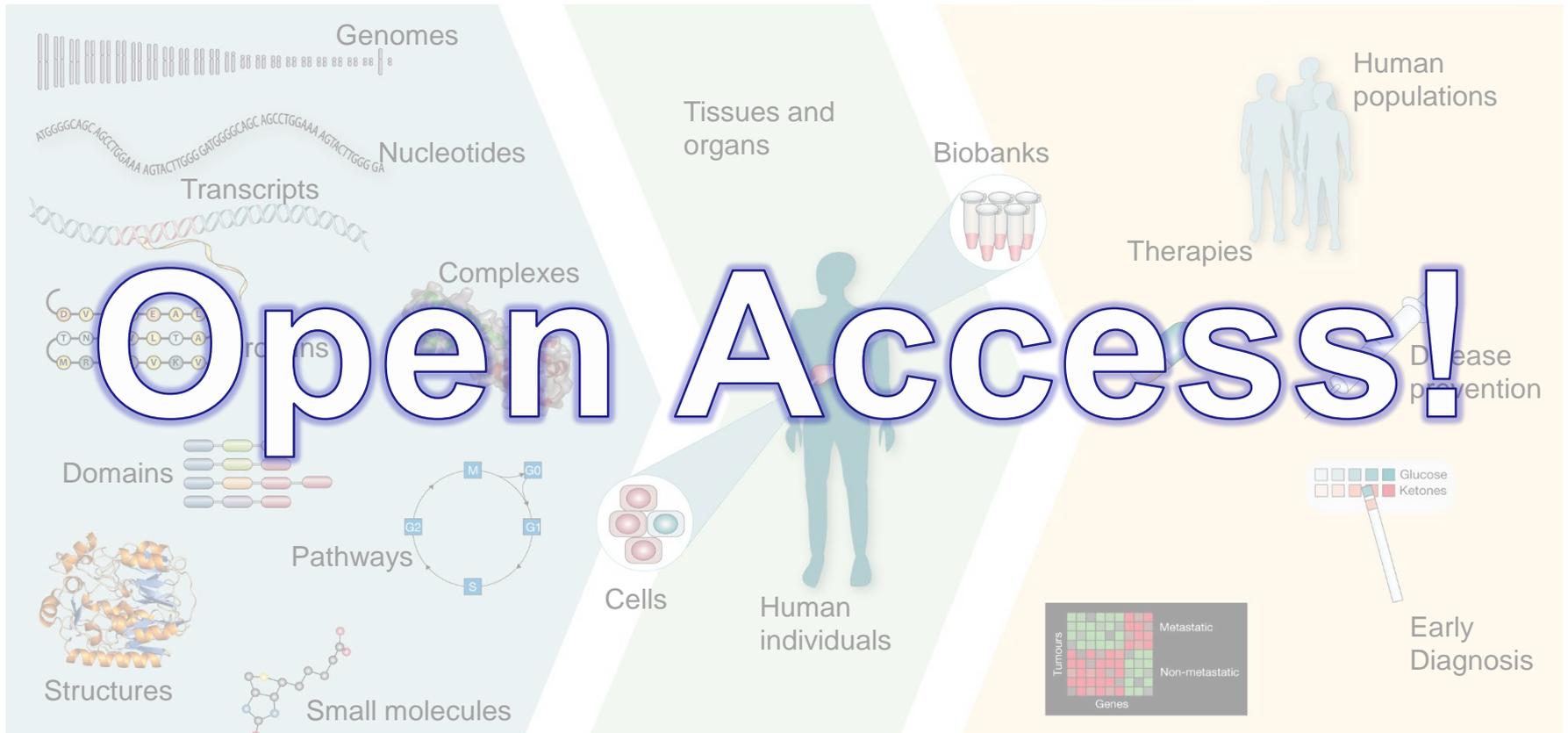
- April 2013 UCL Mtg
- BBSRC, MRC offered conceptual support
- Support working towards complementary Node applications
- Shared EoI applications list w/ applicants, UK funders, & Euro-Biolmaging

BiImagingUK– 2013/2014 Activities

Next Steps

- Expand the community (e.g., plants, biomedical imaging)
- BiImagingUK Facility Handbook– Lucy Collinson & Josh Rappaport
- Training & Methodology-- Lucy Collinson
- Imaging Node Models – submitted to RCUK Nov 2013
- Software Node Models – submitted to RCUK Jan 2014
- “Network” Funding– application submitted to BBSRC Feb 2014
- Road trips...

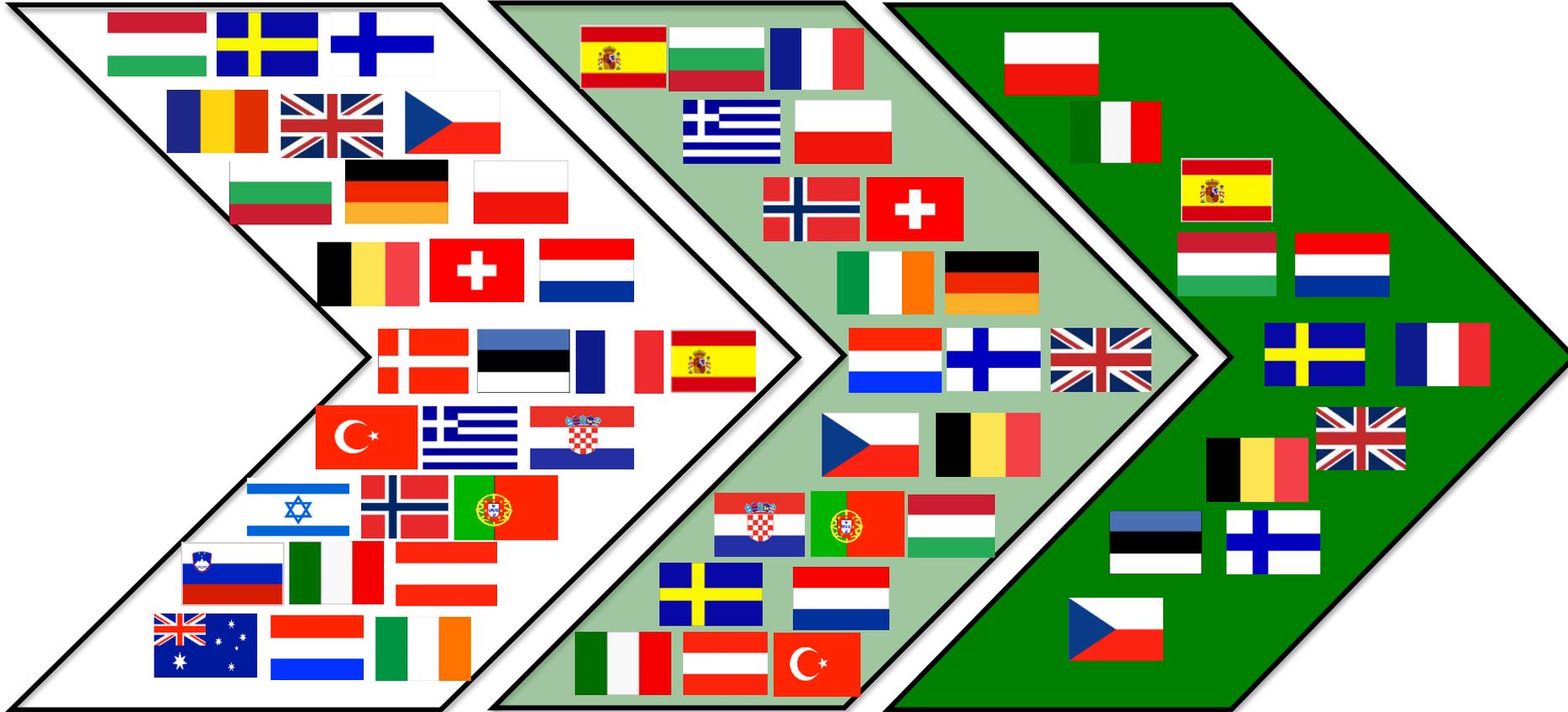




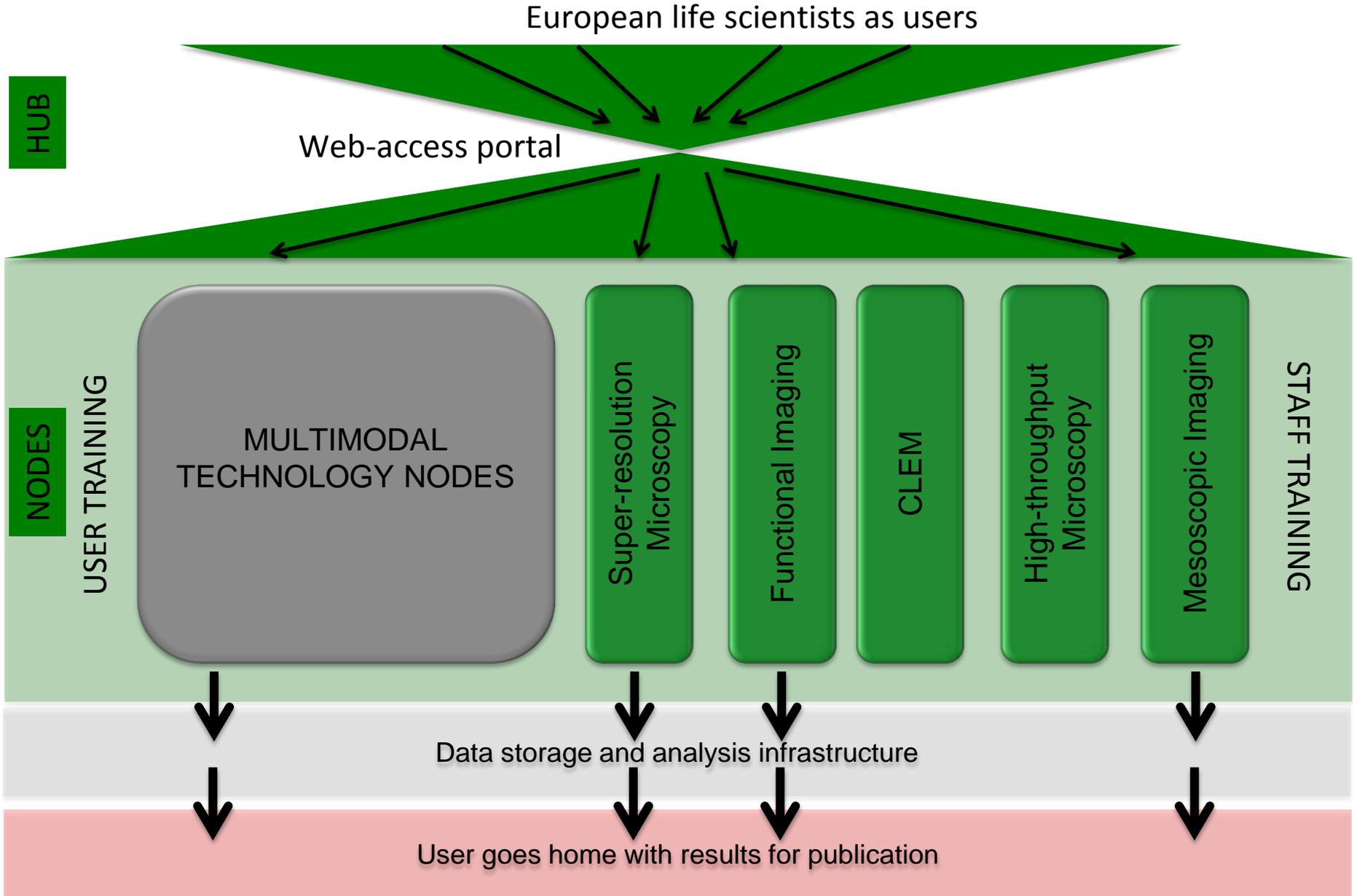
250 Euro-BioImaging Partners from 28 countries

Infrastructure communities In 23 countries

On the roadmap of 12 countries



39 Legal Partners, 250 Associated Partners from 28 Countries, > 270 Letters of Intent, > 1400 Stakeholders



Major Activities

- *Community surveys*– needs of users, capabilities of providers, aspirations of both.
- *Proof of Concept Studies*– Trials of shared access
- *Governance, Legal, and Finance*– running a pan-EU infrastructure.
- *Call for Node Expressions of Interest*– Submissions April 2013, results announced Summer 2013.



Community-driven Strategy Scientific Infrastructure...

Community interest and commitment

- BiolumagingUK, FranceBI, GeBI,....
- Euro-Biolumaging surveys and PCS
- RCUK NGOM applications recognised “access” concept

Strategic Definition and Delivery of Infrastructure

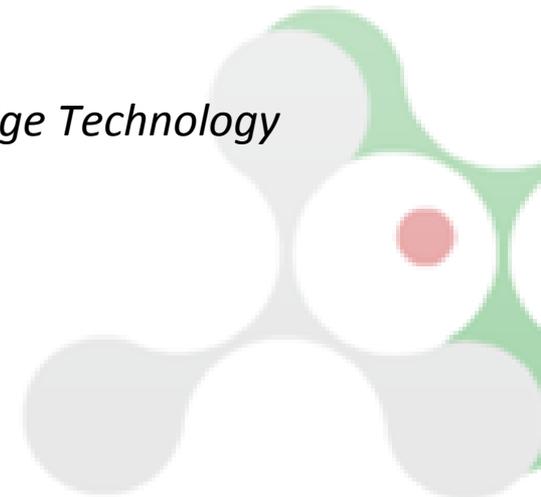
- BiolumagingUK Mtg Summary
 - Community driven
 - Respects different models for different technologies
 - Limited to the breadth and quality of participation
- Partnership of community w/ RCUK & charities
- Commitment to openness
 - Open Wiki
 - Mailing lists
 - Open meetings
- Commitment to partnership
- Other UK imaging communities
- Academic, non-profit and commercial entities

BioImagingUK Community

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- Kurt Andersen (Beatson)
- Nick Long (Imperial)
- Tony Gee (Kings)
- Lucy Collinson (LRI/CRUK)
- David Hawkes (UCL)
- Paul Verkade (Bristol)
- Patrick Hussey (Durham)
- *...and you?*

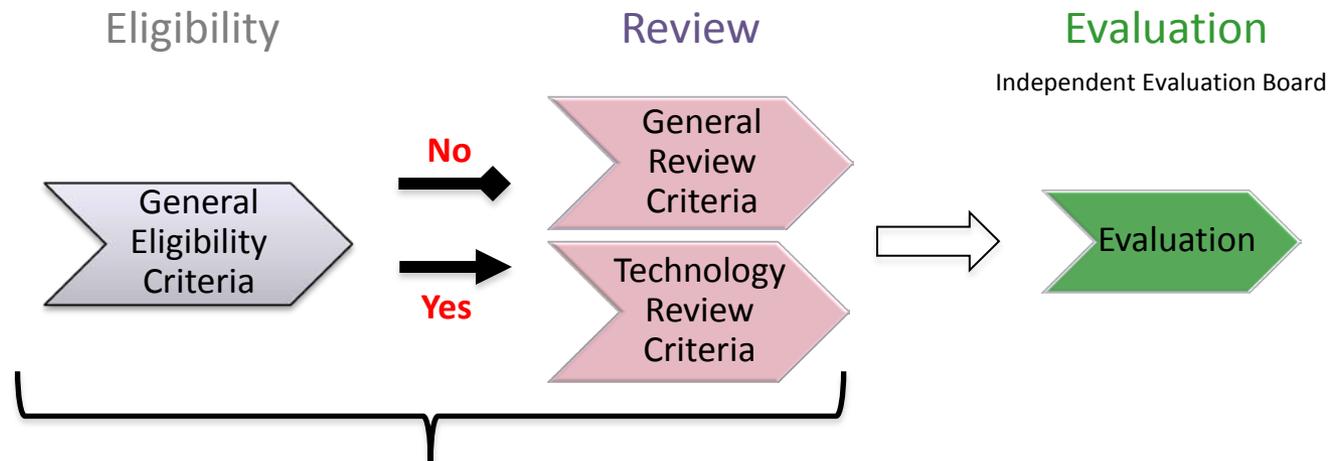
Euro-BioImaging- Moving towards Construction

- Legal & Governance Models: *proposed*
- Community Surveys: *completed & analysed*
- Proof of Concepts: *conceived, run, surveyed, & analysed*
- Plans & Specs for Technical Domains: *completed & approved*
- Data Management & Analysis Strategy: *defined & approved*
- Access & Training Specs: *defined*
- EU Funding Mechanisms: *good progress*
- First Open Call for Euro-BioImaging Nodes: *announced*
- *Formation of BI and MI Working Groups*
- *Final definition of Legal, Governance & Finance Models*
- *Expansion of PCS Concepts to Provide Access to Cutting Edge Technology*
- *EU Funding of Access Proposed*



**1st Open Call for
Euro-BioImaging Nodes**

Criteria and Evaluation Process



Criteria are guidelines for Node applicants to describe the best **integrated service package for the user**

General Eligibility Criteria

- Applicant demonstrates the **user need** for new capacity (Letters of Intent from 50% of external users but max. 30 letters)
- Applicant guarantees to provide **open access** for Euro-BioImaging users to at least 50 % of new capacity (comprises instrument time, staff capacity, storage capacity, ...)
- Applicant demonstrates existing **communication** with national/regional funders for infrastructure capacity upgrade
- The applicant demonstrates that the single-sited or multi-sited Node will constitute a **legal entity**, which in its entirety will become part of Euro-BioImaging and as such a legal contractual partner of Euro-BioImaging
- Applicants from **ESFRI Countries** are eligible.

General Review Criteria

- Applicant describes and demonstrates **scientific and technical excellence** and the suitability, quality and geographic coverage of its academic environment.
- Applicant demonstrates its **European significance**.

1st Open Call: Jan - Apr 2013

- **1st Call** focuses on technologies that will provide **physical open access** to biological and medical imaging technologies. Also calls for Nodes for Data Infrastructure (Challenges) and Population Imaging (Data Sharing and Archive)
- **Applicants have to meet** the general eligibility and will be reviewed by technology specific node **criteria**
- **Additional imaging technologies** will be added in **regular calls** following the Euro-BioImaging technology identification process (user need, infrastructure model, feasibility/PCS, open call)

1. **Independent Evaluation Board of European and international science and technology experts** evaluates all applications according to the published criteria for Nodes.

Nodes are eligible, if they meet the eligibility criteria and will be reviewed for European significance by the review criteria.

2. **Funders decide** if they invest into their successful applicant(s) for constructing and operating the Euro-BioImaging node
3. **Euro-BioImaging governing board representing all participating countries decides** on inclusion of Nodes into the European infrastructure.

Euro-BioImaging & the UK (I)

- Several (>10?) UK facilities preparing Node applications
 - Each requires LoS from UK funding entity
 - Each guarantees 50% of new capacity for external access
- Many of Euro-BioImaging's (advanced technology construction & access, training, etc.) align well with UK goals and reqs for scientific excellence & leadership
- Other EU members (e.g. FR, DE, FI, NL, etc.) moving ahead with national coordination (e.g., Ministry of Science as single Euro-BioImaging Node)
- How do UK scientists access advanced imaging technology as the available resources grow?
 - will my postdoc go to Birmingham, London, Paris, Utrecht, or Heidelberg?
- What financial resources are available to support Euro-BioImaging Nodes?

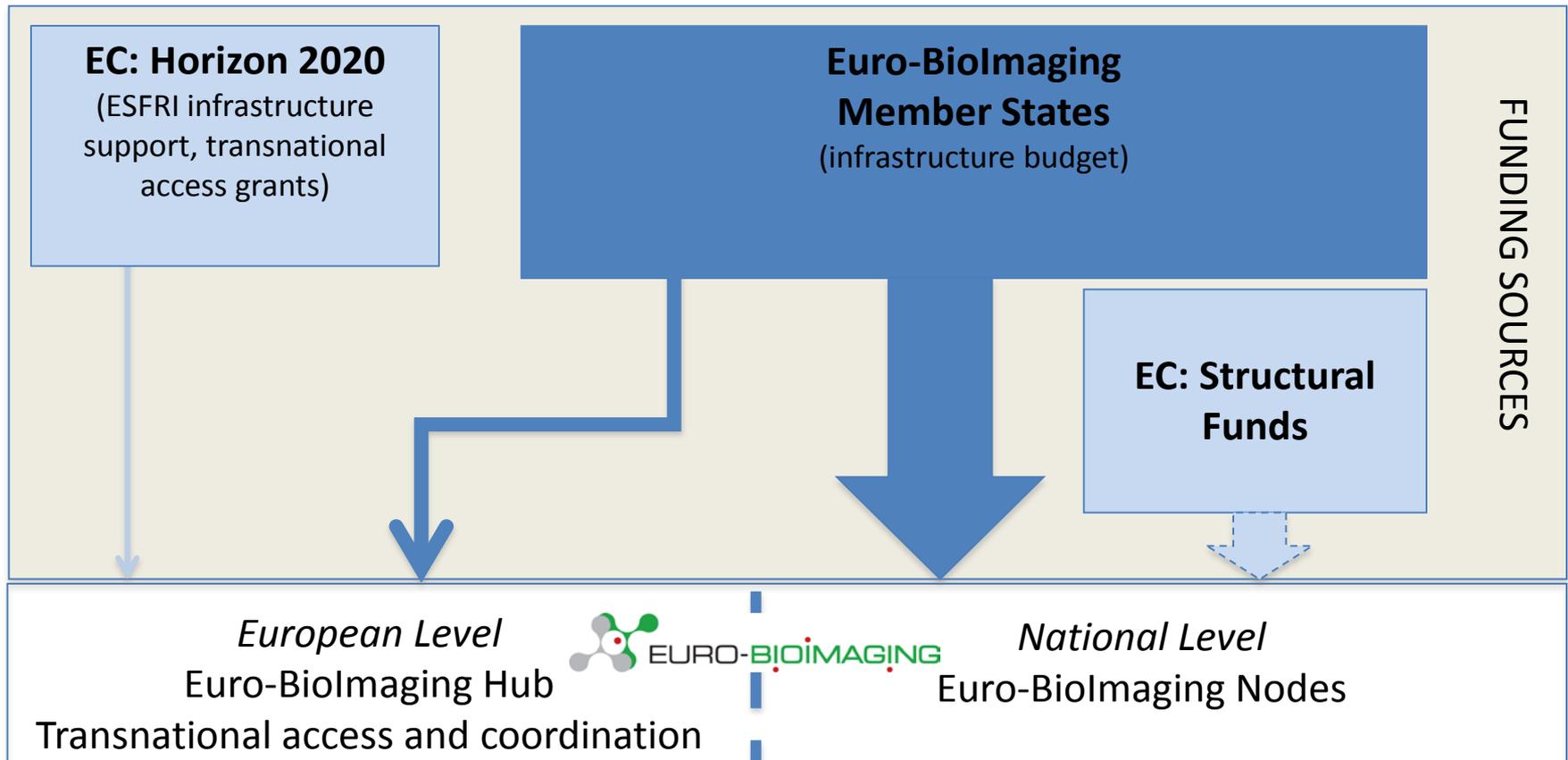
Euro-BioImaging & the UK (II)

- Attempt to coordinate applications
 - BioImagingUK Meeting of all potential applicants (UCLmeeting)
 - Define complementarity, rationalise competition as necessary
 - List of applicants, shared with all applicants, UK funders, Euro-BioImaging
- Future funding?
 - What does Node status mean?
 - Is it useful to create UK value in this status?
 - Who pays? The (evolving) Euro-BioImaging model:
 - National funders fund “Construction”
 - National funders contribute to central European fund for access and maintenance
 - H2020 funding for access
- Management & Review
 - What is the relationship between UK’s Nodes and Euro-BioImaging?

The UK’s Position

- Are current & future UK investments enhanced by strong commitment to Euro-BioImaging?
- Will existing & new investments and facilities compete with others in EU?

Funding sources for Euro-BioImaging Hub and Nodes construction and operation



Euro-BioImaging & the UK (II)

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Not a true scientific meeting (sorry!)

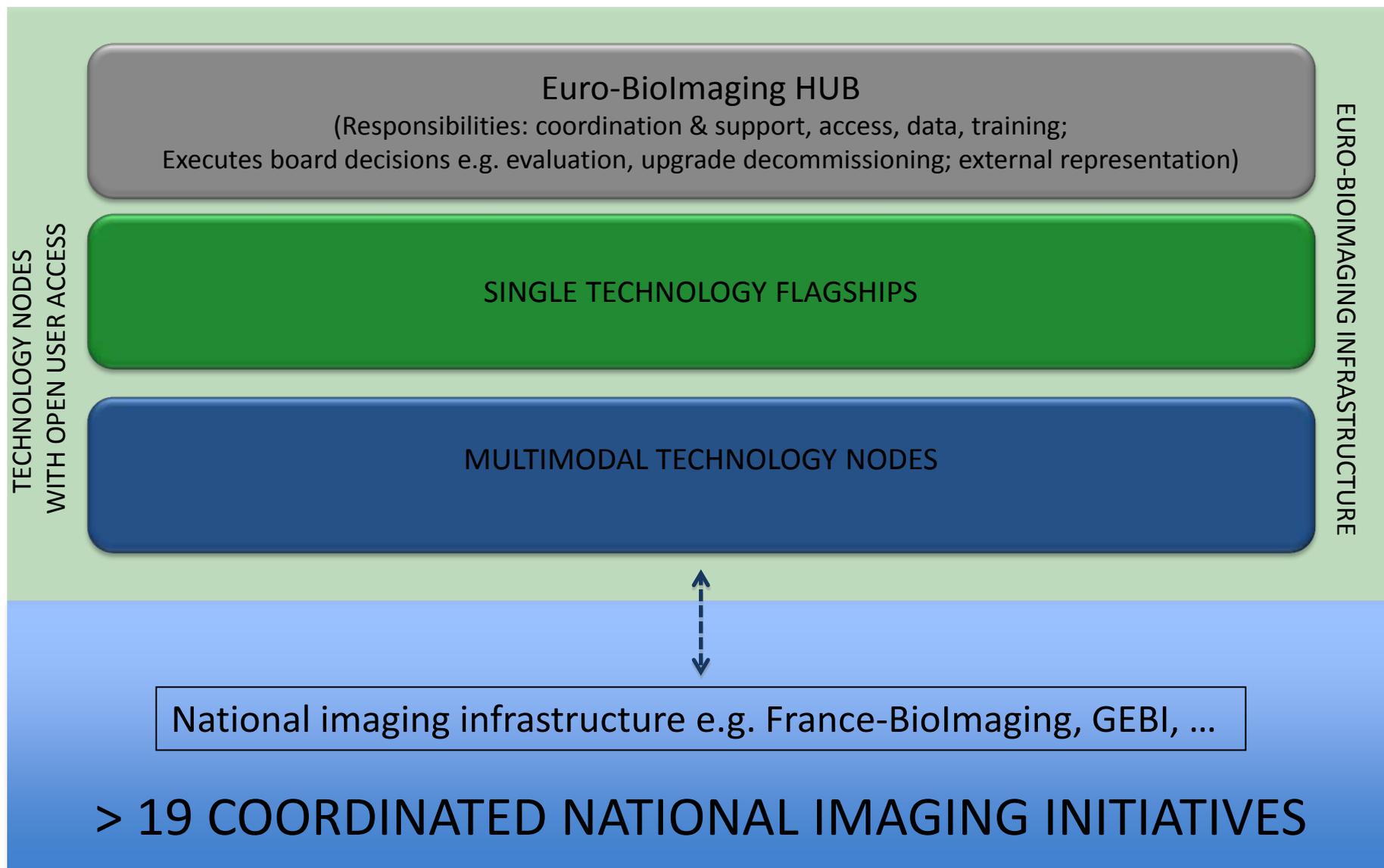
Imaging for Biological & Medical Research

- depends on *sustainable and usable* technical development, hardware, & expertise
- e.g., Probes, Specimen delivery, Image acquisition, Processing & analysis, Sharing & Publication.

Each requires

- Infrastructure & tools
- Expertise and know-how
- Sustainable implementation and development

Each of these steps requires significant *initial* and *ongoing* investment





Major results

- 97% of facilities would offer open access after capacity upgrade
- 99% of PCS users would use Euro-BioImaging facilities again
- > 60% of all users applied for transnational access, 89% left their home town.
- >70% rated results good to excellent for publication