RAMIRI

SEVENTH FRAMEWORK PROGRAMME

European Molecular Biology Laboratory
Case Example

Silke Schumacher

EMBL

European Molecular Biology Laboratory

Case Example

Dr. Silke Schumacher
Director International Relations

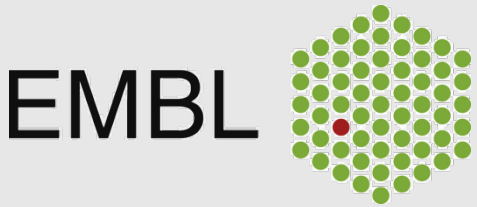
EMBL

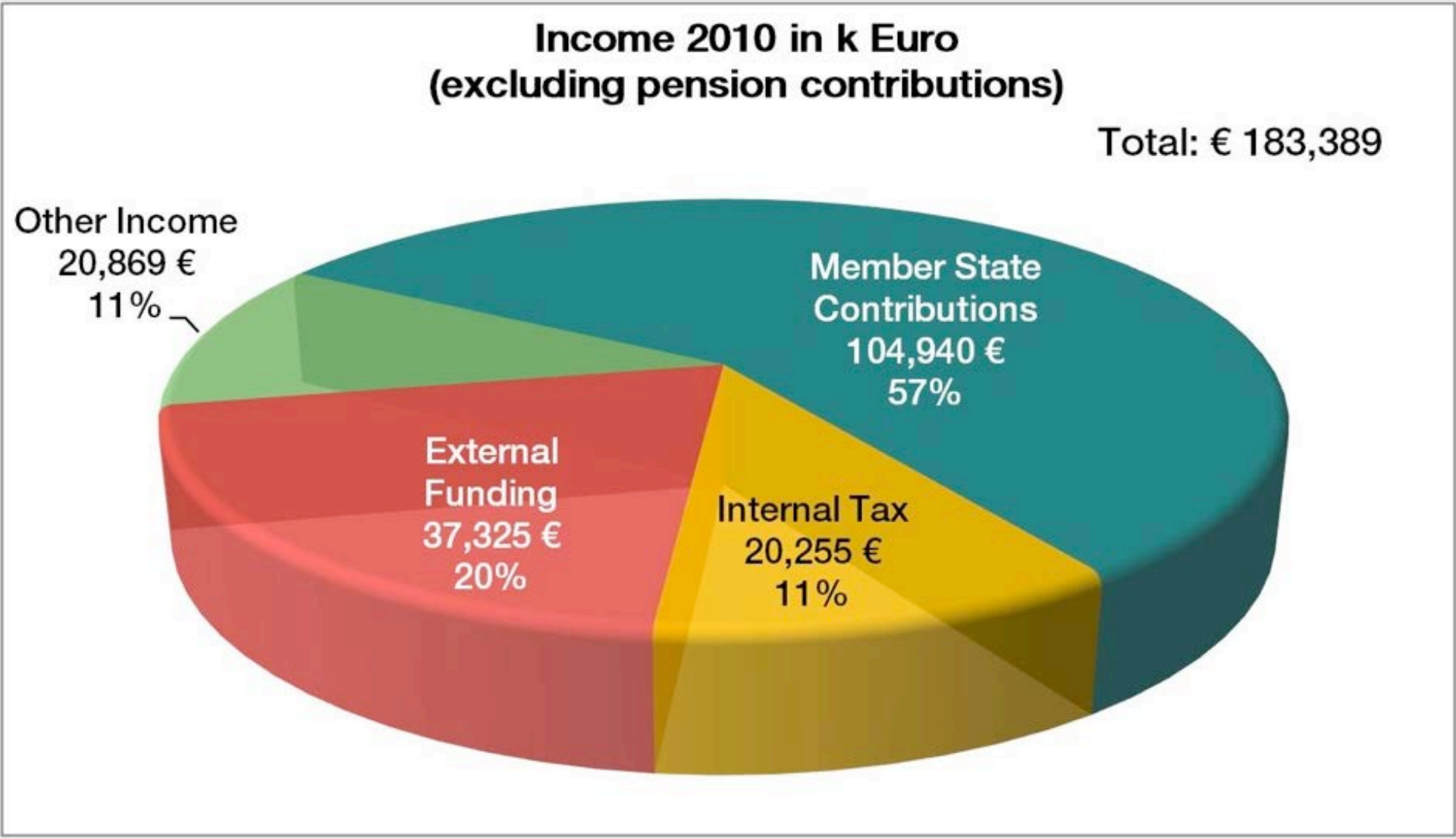
EMBL Member States

Austria 1974
Denmark 1974
France 1974
Germany 1974
Israel 1974
Italy 1974
Netherlands 1974
Sweden 1974
Switzerland 1974
United Kingdom 1974
Finland 1984
Greece 1984
Norway 1985
Spain 1986
Belgium 1990
Portugal 1998
Ireland 2003
Iceland 2005
Croatia 2006
Luxembourg 2007

Australia 2008 (1st Associate Member)

EIROforum - EMBL is one of eight inter-governmental research organisations




Income 2010 in k Euro
(excluding pension contributions)
Total: € 183,389
Other Income
20,869 €
11%
Member State
Contributions
104,940 €
57%
External
Funding
37,325 €
20%
Internal Tax
20,255 €
11%

28.06.201

EMBL Member State Contributions

The established method of calculating the contributions of EMBL Member States is according to a scale that is readjusted every three years, on the basis of net national income at factor cost, in US dollars, over the last three years for which official statistics are available from the OECD in Paris.

No “juste retour”!

The Five Branches of EMBL

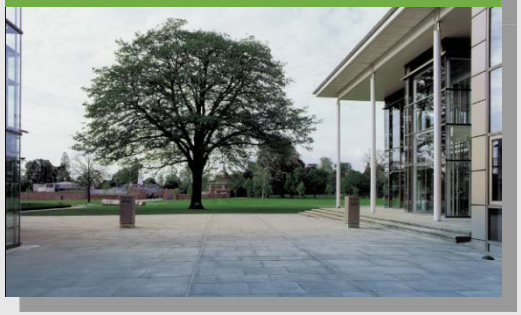
Heidelberg

Basic Molecular Biology
Research Laboratory
Central Administration
EMBO

Hamburg

Structural Biology
DESY, CSSB, XFEL

Hinxton



European Bioinformatics
Institute (EBI)
Sanger Centre

Grenoble

Structural Biology
ILL, ESRF, IBS, UVHCI

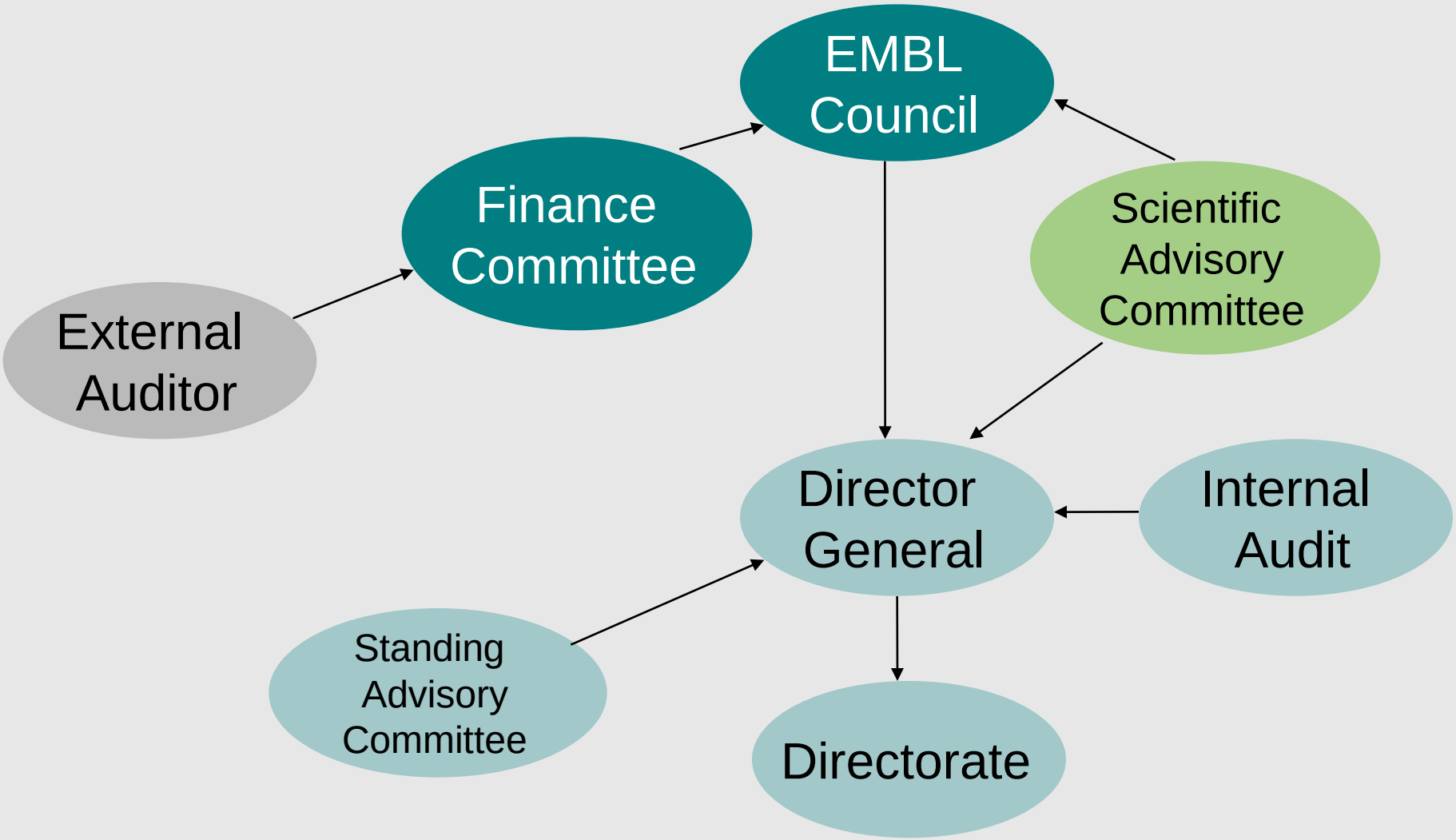
Monterotondo

Mousebiology
EMMA, CNR

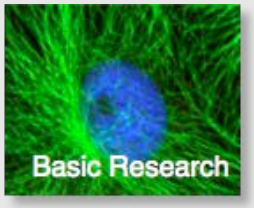
1600 staff
>70 nationalities

EMBL

EMBL Governance



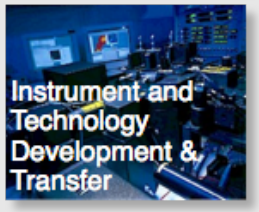
Goals for the EMBL Programme 2012-2016



1) Forefront life science research: setting trends and pushing the limits of technology

2) Providing world-class research infrastructure and services to the member states

3) Training and inspiring the next generation of scientific stars

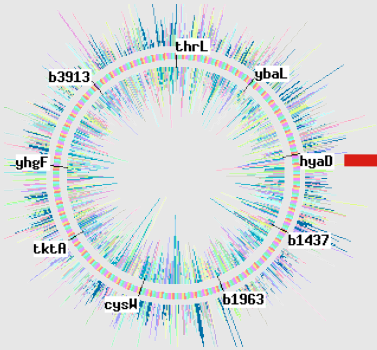


4) Driving research, innovation and progress through technology development, interactions with industry and technology transfer

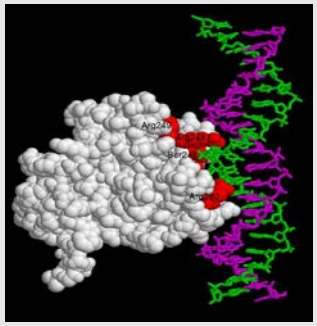
5) Taking a leading role in the integration of life science research in Europe

EMBL

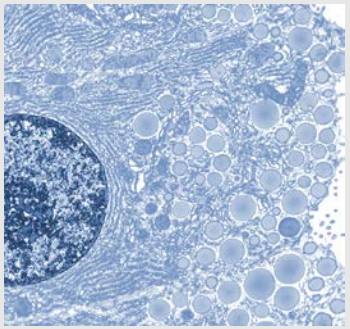
Biology: From Molecules to Organisms



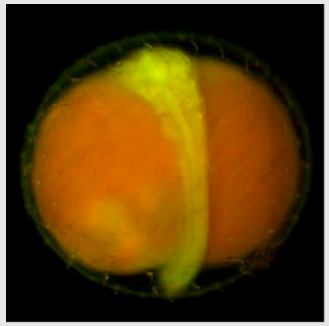
Genome



Protein/DNA



Cell



Embryo

Fruitfly

Mouse

Organism

EMBL

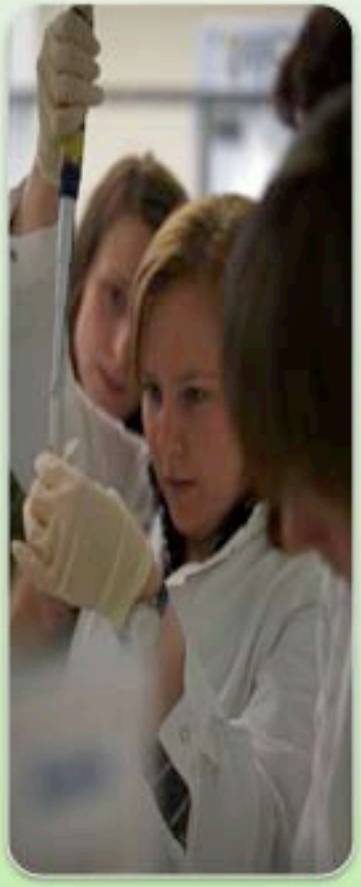
EMBL's citation ranking

- EMBL ranks as top European institute and fourth worldwide 1999-2009 in molecular biology and genetics (Thomson Essential Science Indicators)

	Institution	Papers	Citations	Citations per paper
1	Cold Spring Harbor Lab	669	63,570	95.02
2	MIT	1,995	163,596	82.00
3	Salk Institute for Biological Studies	707	49,996	70.72
4	European Molecular Biology Lab	1,435	94,736	66.02
5	Memorial Sloan-Kettering Cancer Centre	1,099	71,250	64.83
6	Wellcome Trust Sanger Institute	790	50,997	64.55
7	Rockefeller University	1,332	83,307	62.54
8	Dana Farber Cancer Institute	673	41,627	61.85
9	Massachusetts General Hospital	1,447	86,773	59.97
10	Cancer Research UK	752	44,343	58.97

EMBL

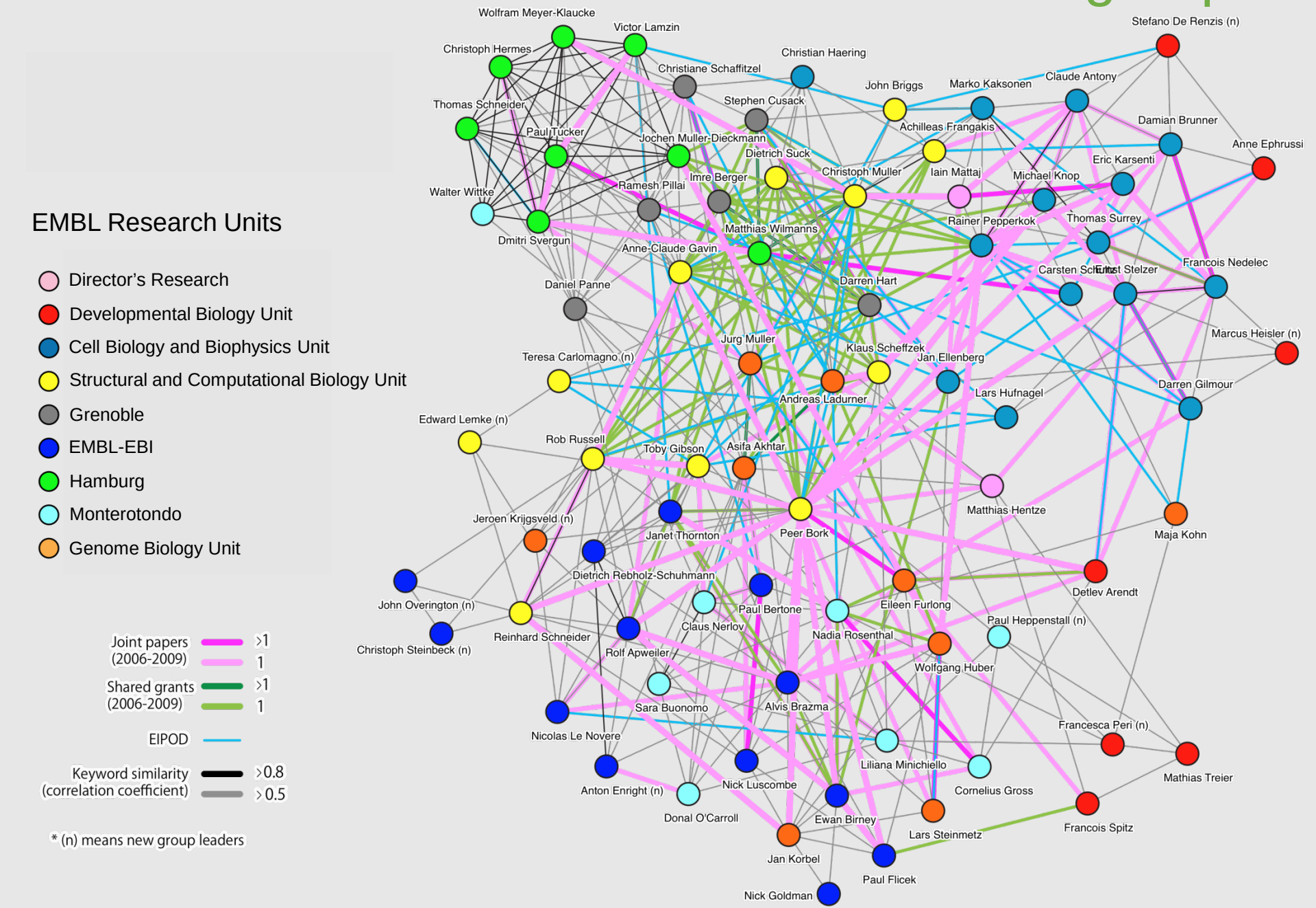
What makes EMBL so special?



Outstanding science

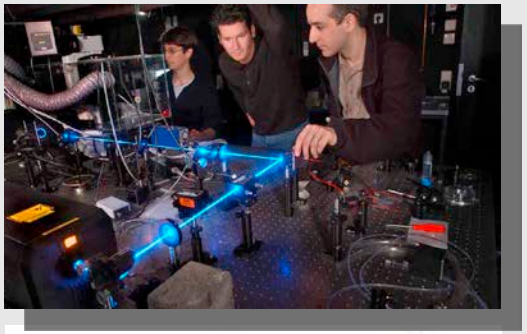
- 'Hire the best'
- A combination of synergistic missions
- Continuous turnover
- International (>70 nations)
- Stringent quality control (Scientific Advisory Committee)
- Financial, intellectual and technical support

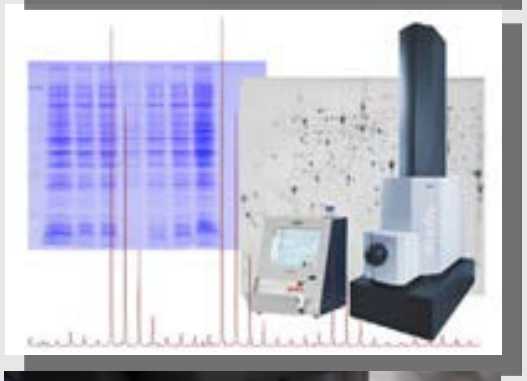
Collaborations between EMBL research groups

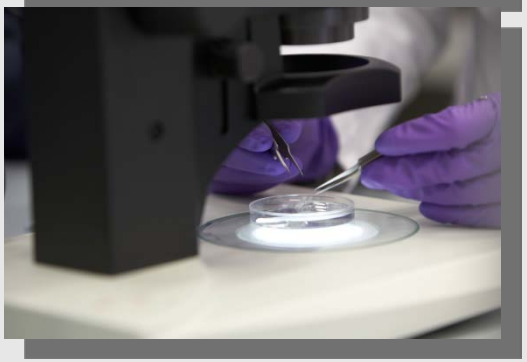


EMBL Scientific Core Facilities

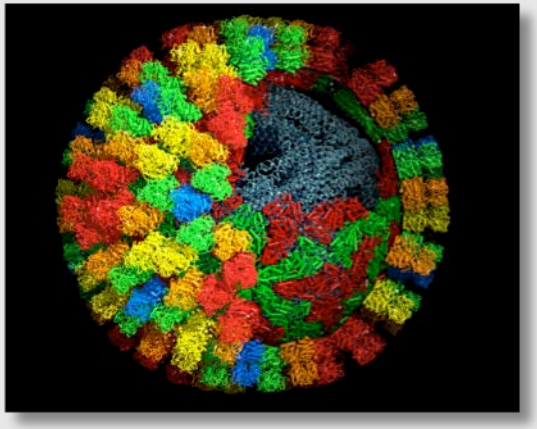
- Advanced Light Microscopy
- Chemical Biology
- Electron Microscopy
- Flow Cytometry
- Protein Expression & Purification
- Genomics
- Proteomics
- Monoclonal Antibodies
- Transgenics



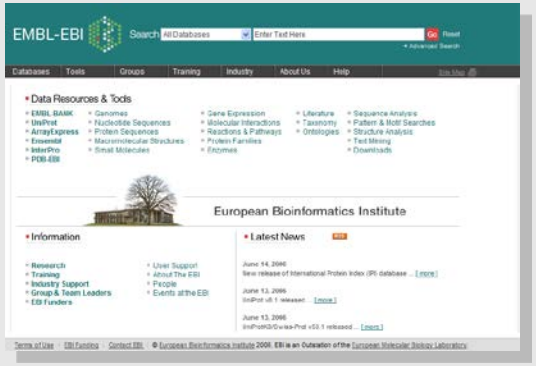




EMBL Services



Structural Biology
More than 3,000 users per year



Bioinformatics
>6,500,000 web hits per day

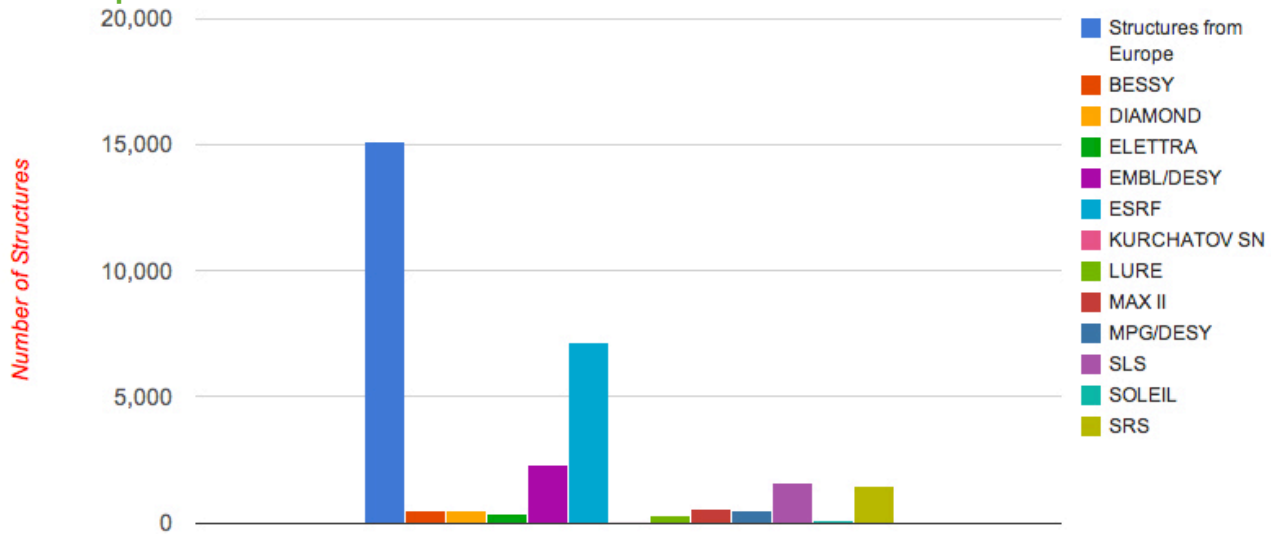
Around 6000 meeting/training course participants and 450 visiting scientists per year at all EMBL sites

EMBL

EMBL Services in Structural Biology

- In Hamburg and Grenoble EMBL provides access to synchrotron radiation for biological applications at DESY and ESRF
- In Hamburg EMBL explores biological applications of the new European-XFEL

Deposited PDB structures by synchrotron facilities in Europe since 1995



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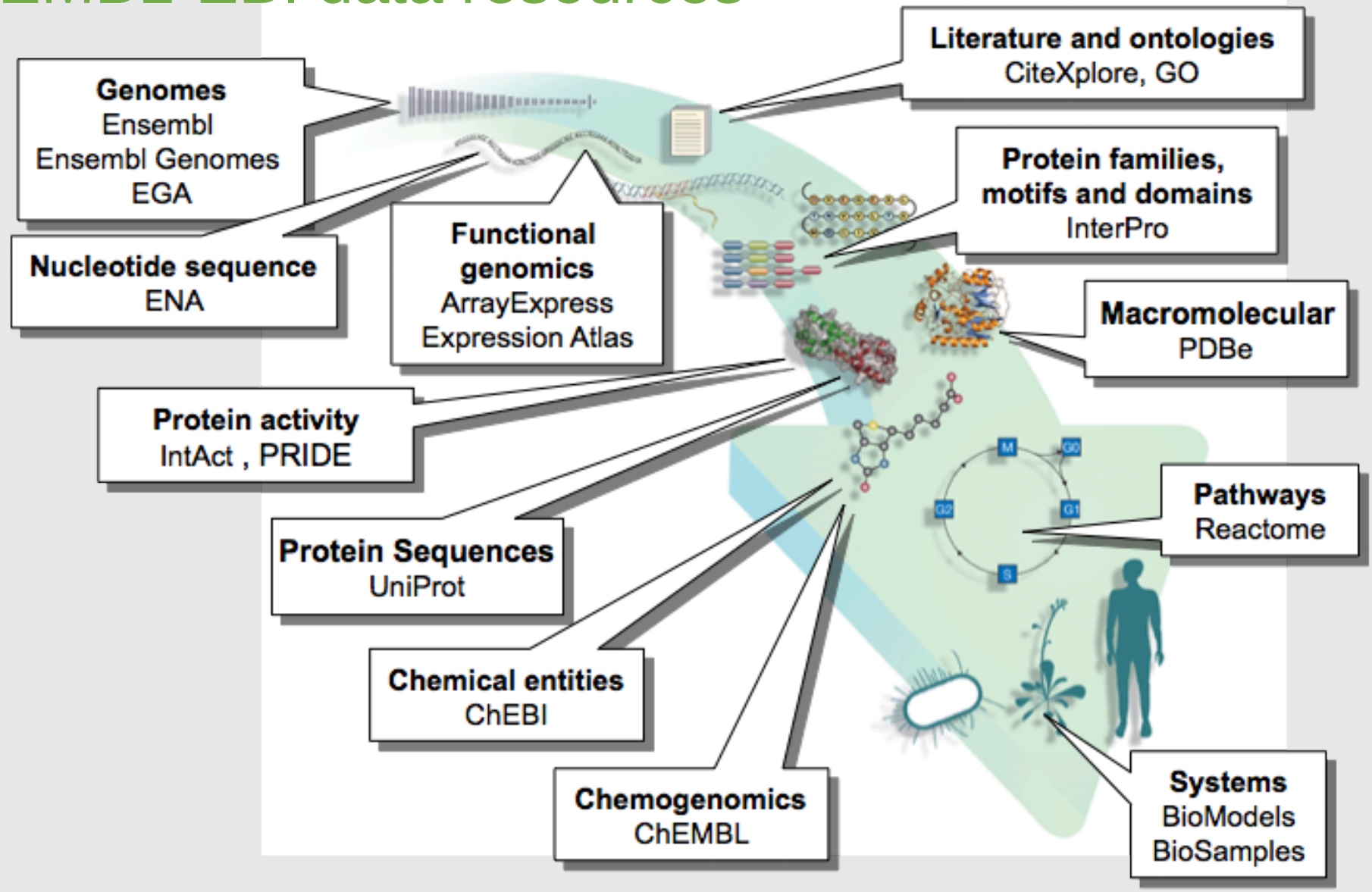
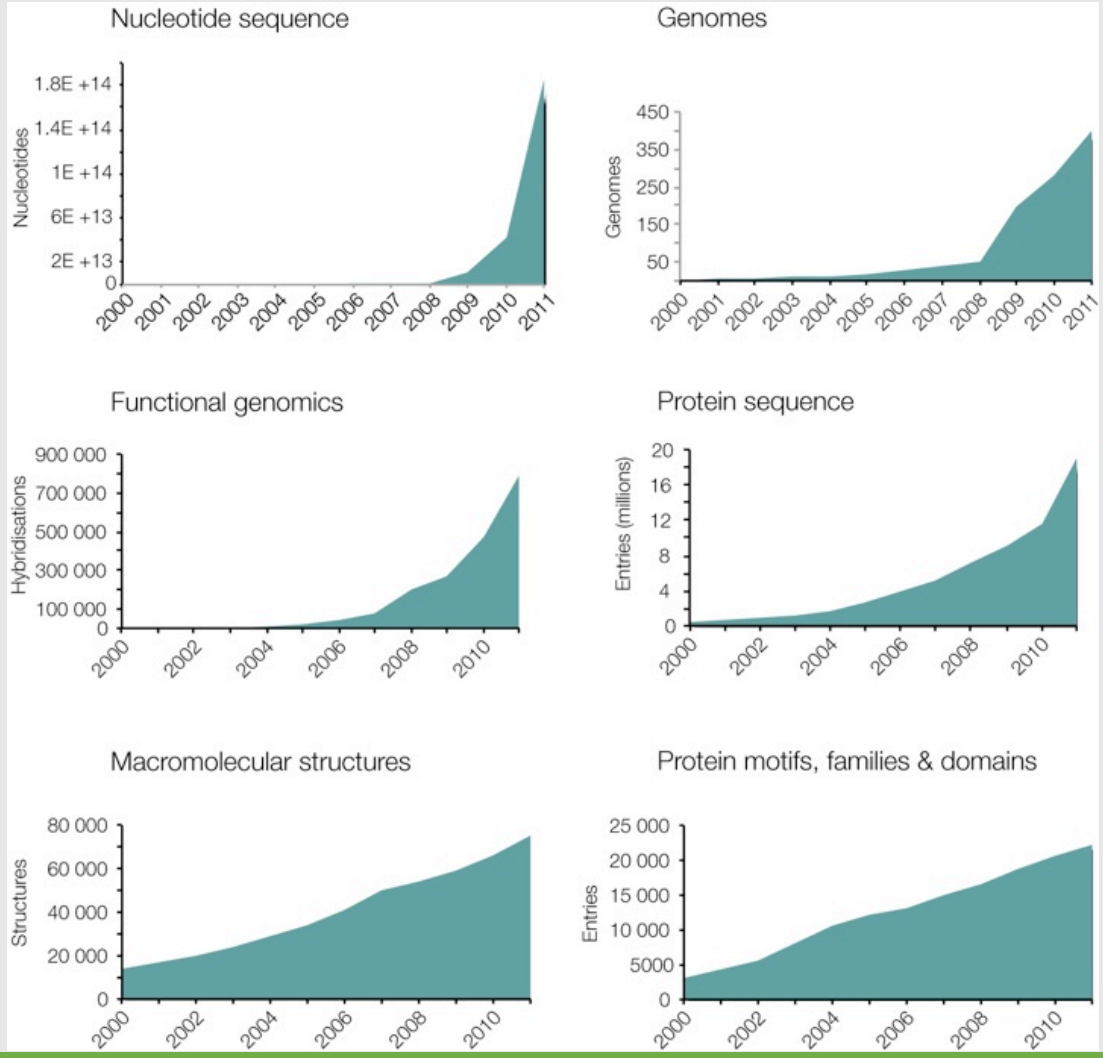
EMBL-EBI data resources



EMBL

EMBL-EBI Bioinformatics Services

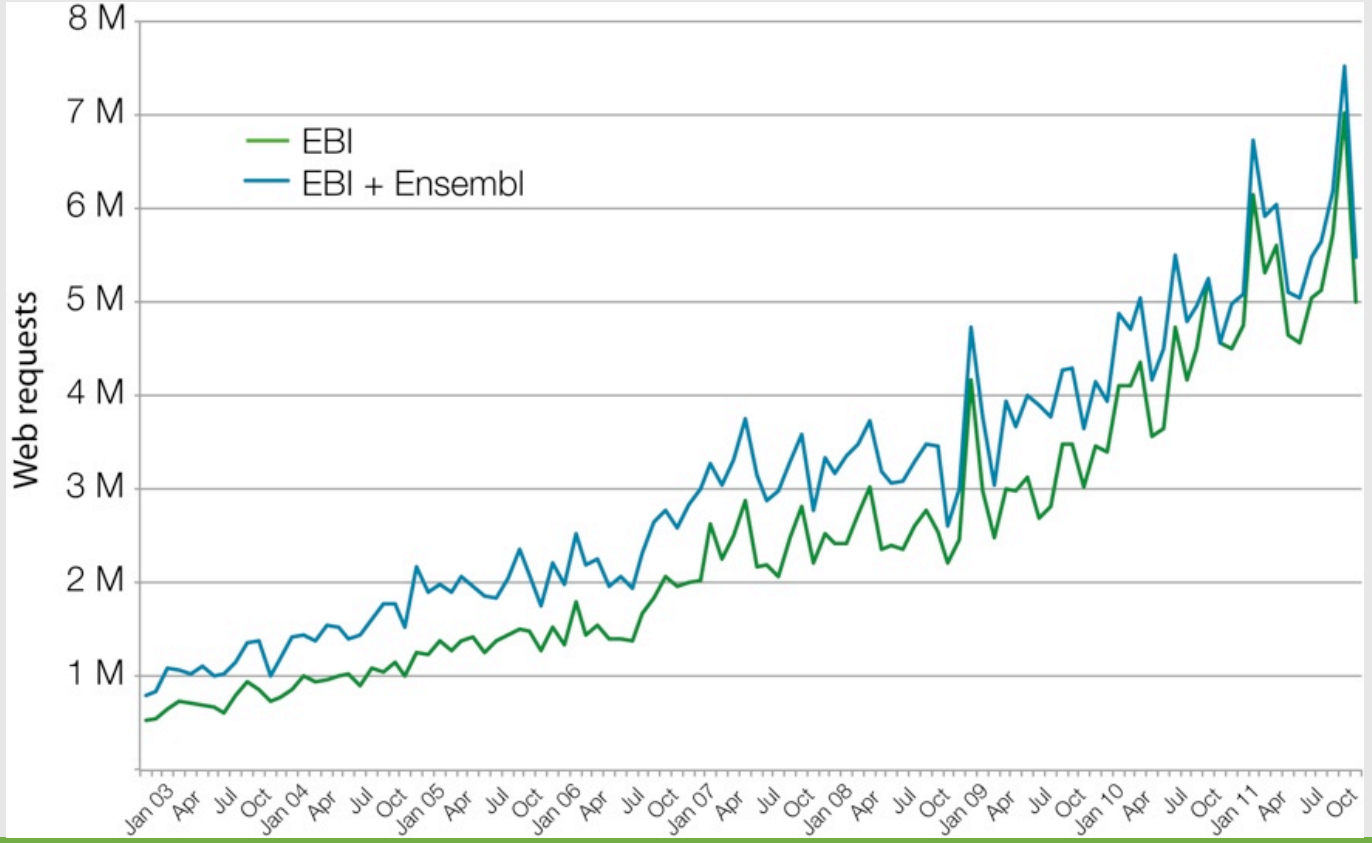
- Provide Europe with the biological data that serves basic research and innovation in biology, health and agriculture.
- Keeping up with growing data volumes
- Data integration



EMBL

Usage of EMBL-EBI services

- EMBL-EBI offers Europe's most extensive and most widely used biomolecular databases
- 6.5 million webhits per day from academia and industry
- Usage from >3 million unique IP addresses per year



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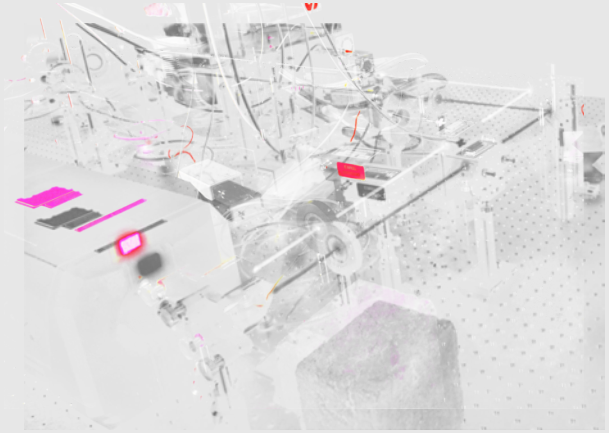
Technology Development

- EMBL develops a broad spectrum of technology and instrumentation for life science research
- Cross-fertilisation between research activities and technology development

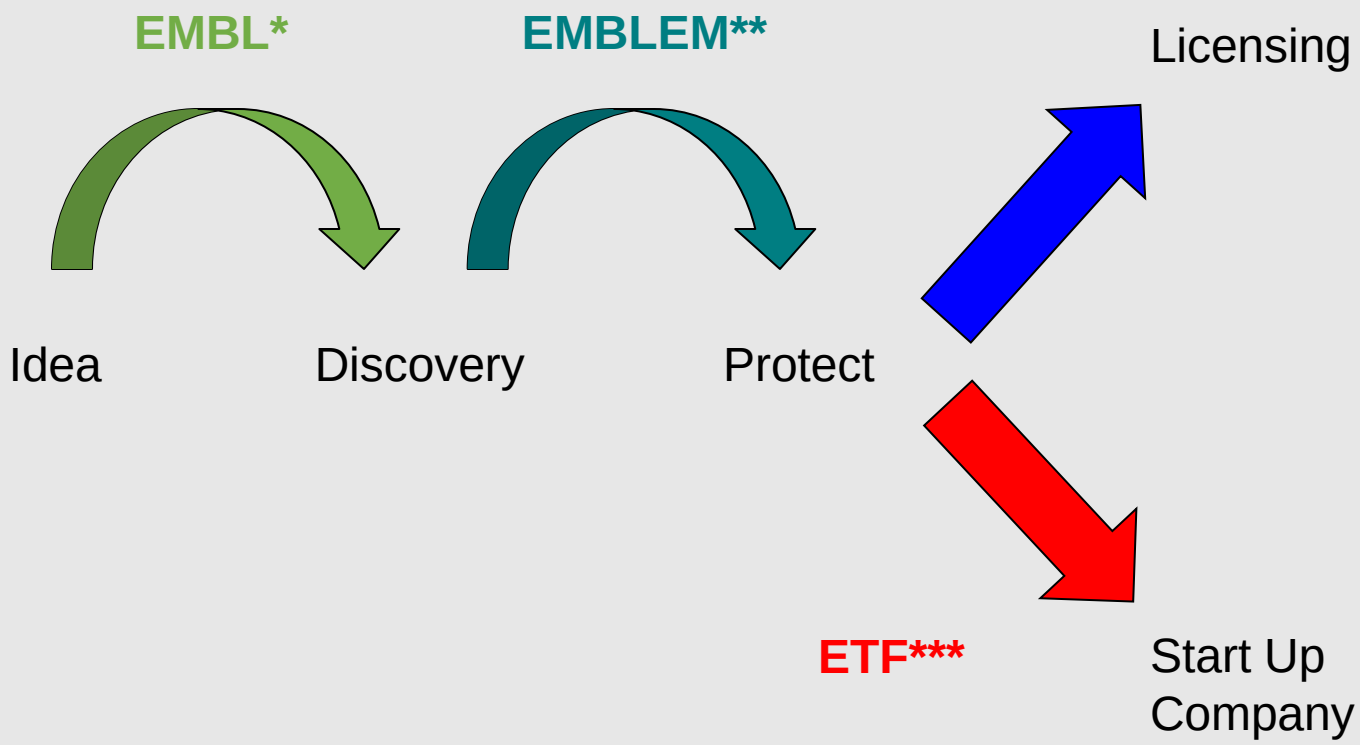


Imaging technology

Software development

Synchrotron instrumentation

EMBL Technology Transfer



* European Molecular Biology Laboratory (http://www.embl.org)
** EMBLEM Technology Transfer GmbH (http://www.embl-em.de)
*** EMBL Technology Fund (http://www.embl-ventures.com)

EMBL

EMBL Spin out companies

Name	Field	Founding Year	VC Fin. Phase
Lion Bioscience AG	Bioinformatics	1997	Post IPO
Cenix Bioscience GmbH	RNAi	1999	2nd round
Cellzome AG	Chem. Proteomics	2000	4th round
Anadys Inc.	Anti Viral	2000	Post IPO
Gene Bridges GmbH	Genetic Eng.	2000	-
EVP Inc.	NeuronalDisorders	2001	3rd round
SLS GmbH	Software	2002	-
Hybricore GmbH	HT mAb Prod	2002	seed
Triskel Ltd.	Oncology	2006	seed
Elara Pharma GmbH	Oncology	2006	1st round
BioBytes	Bioinformatics	2008	seed
Savira Pharmaceuticals GmbH	Anti Viral	2009	seed

EMBL's Interaction with Bio-Industries

- Operation of key research infrastructures
- Diverse range of training activities
- EMBL-EBI Industry Programme
- EMBL ATC Corporate Partnership Programme
- Innovative Medicine Initiative (EU-funded programmes)
- Pistoia Alliance
- Interaction between beamline engineers and Core Facility staff and bio-industries

EMBL Training

Intramural training

EMBL International PhD Programme

EMBL Postdoctoral Programme

General Training & Development Programme

Extramural training

EMBL Courses & Conferences

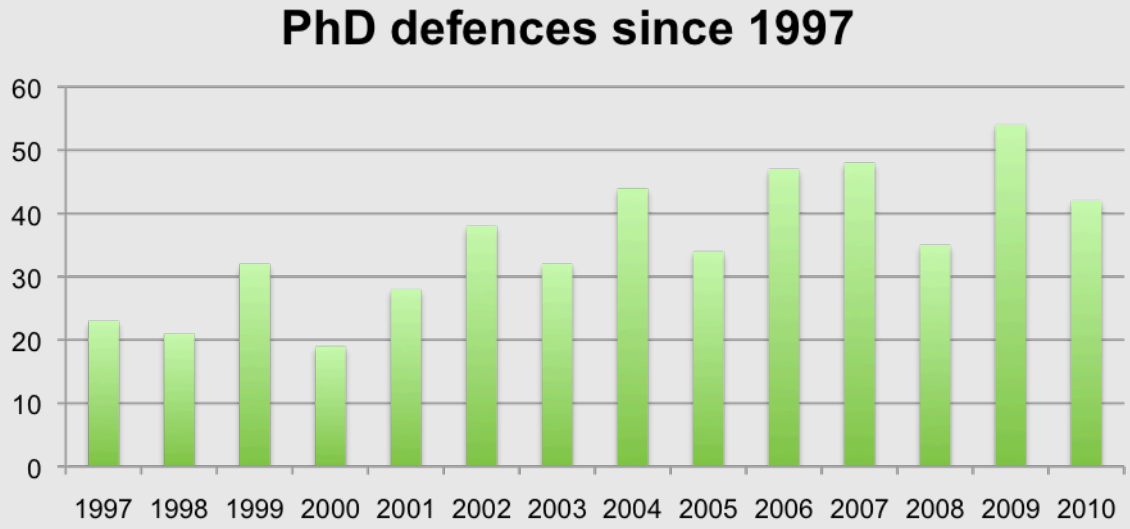
European Learning Lab for the Life Sciences

EMBL Visitors' & Scholars' Programme

EMBL

EMBL International PhD Programme (EIPP)

- Created in 1983, can award its own PhD degree (since 1997)
- Joint PhD degree with 29 universities in 19 countries, including Iceland University
- EMBL fellowships only for students from member states
- 40% EMBL internal fellowships / 60% external fellowships
- Average: ca 170-200 students from more than 40 countries



Currently two PhD students from Iceland!

EMBL

EMBL Postdoctoral Programme

- EMBL Postdoctoral Association
- Second Mentor Programme
- Special Career Development Opportunities
- Competitive salary and social benefits

EIPOD – EMBL Interdisciplinary Postdocs

- Interdisciplinary research project, hosted in two different labs at the five EMBL sites
- EU Sponsored (Marie Curie Co-Fund)
- Full three years of EMBL funding
- Priority to member state applicants
- Average intake 10-15 EIPODs per year

EMBL

EMBL Courses and Conferences

- EMBL ATC: hub for advanced life science training and exchange in Europe
- Opening on 9 March 2010
- In 2010 & 2011:

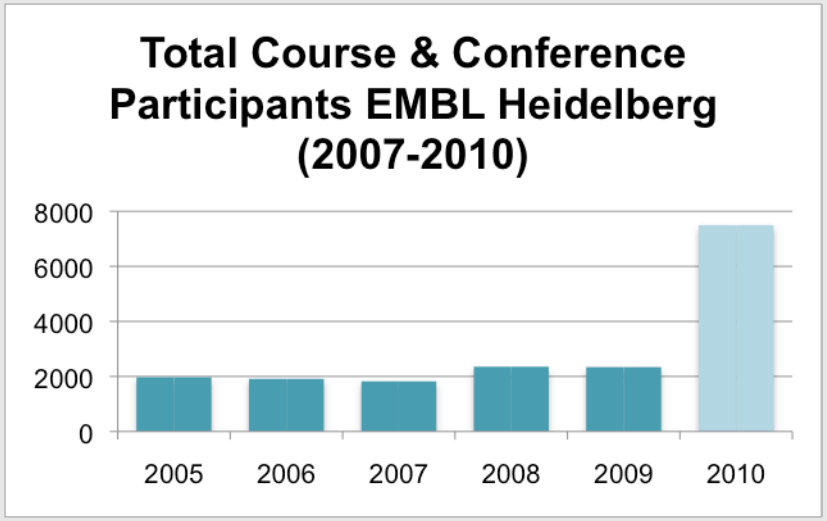
  47 conferences & meetings

  46 courses
- ~10,000 participants
- New training formats:

  EMBO | EMBL Symposia

  Tailored practical courses

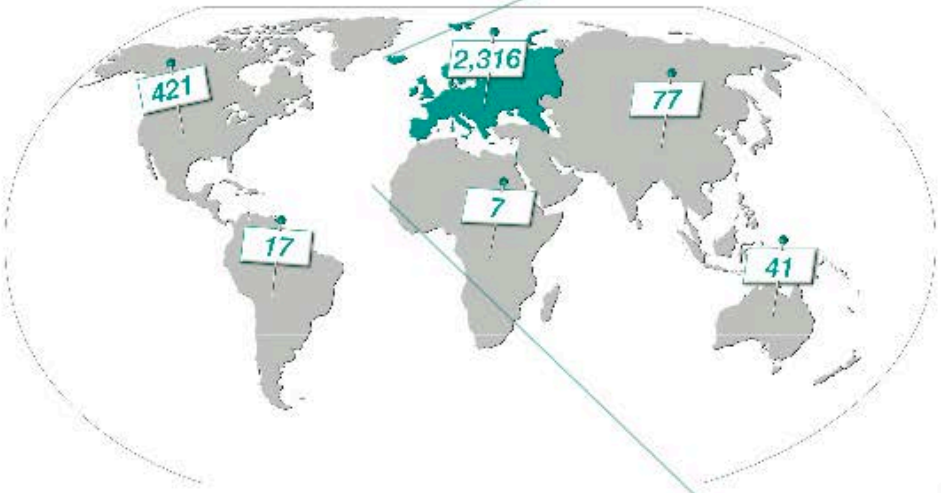
  Vision 2020 lecture series



EMBL

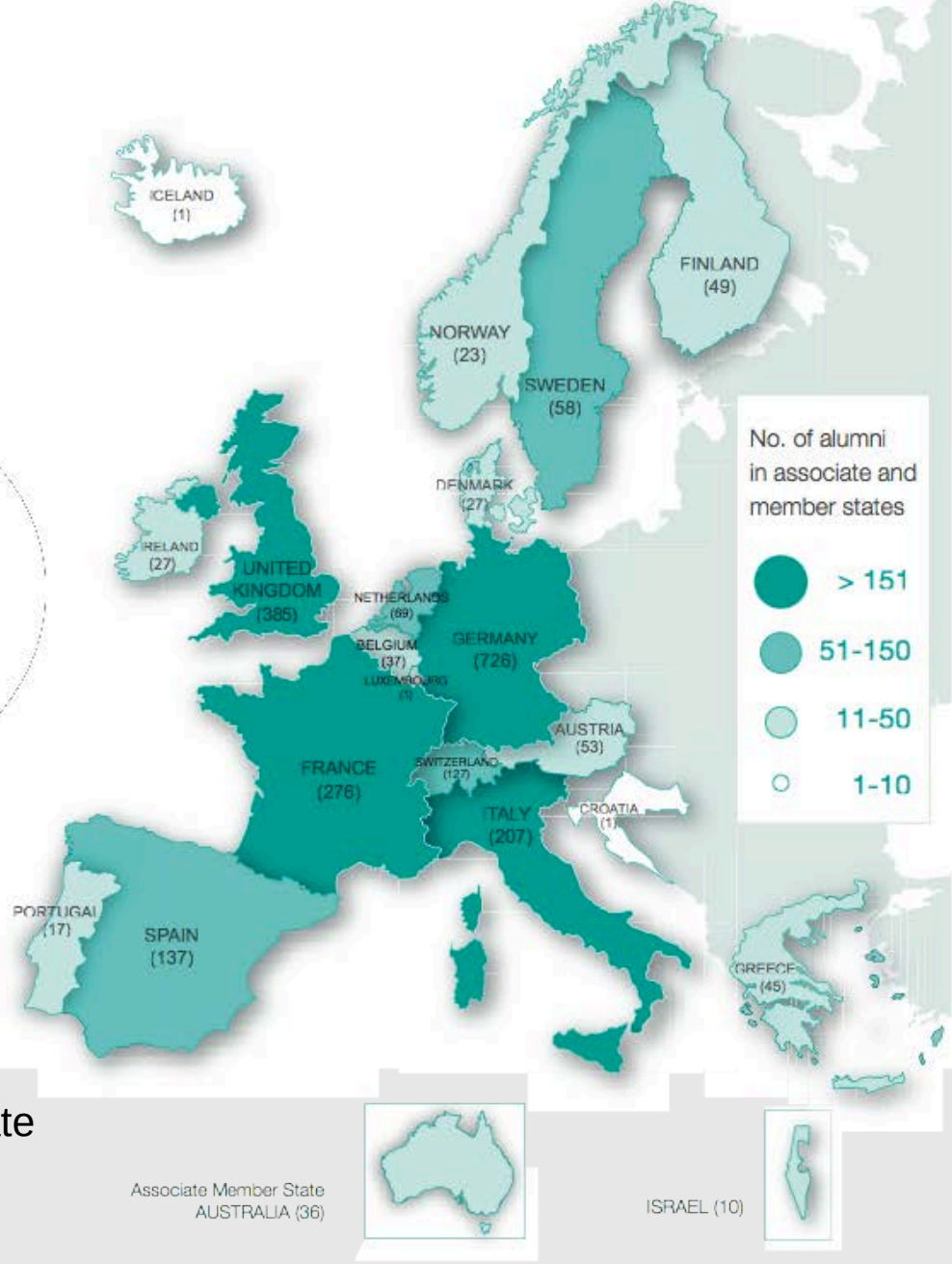
EMBL ALUMNI

- > 5000 alumni are EMBL's strongest asset



No. of alumni in 5 continents

- ~3000 alumni with known country of residence
- 81% live in EMBL member and associate member states



EMBL

Integration of life science research in Europe

Encourage all European countries to join EMBL.

- New EU member states

Serve an integrating role in life science research.

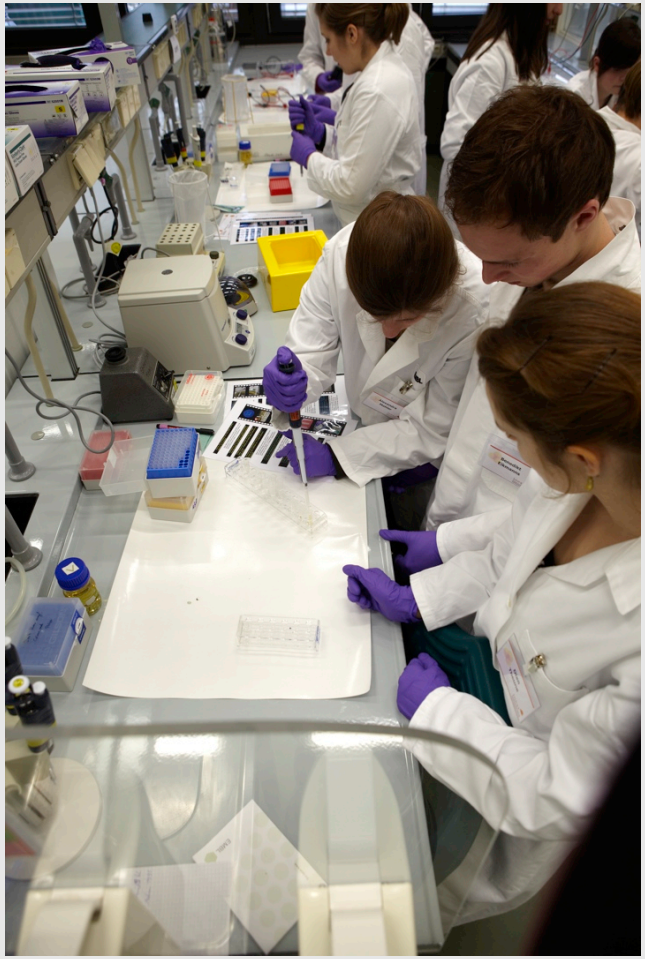
- Collaborations (2008-2010 ~2700 external collaborations, 247 publications)
- EMBL researchers coordinated 29 and participated in >130 FP6 + 7 projects

Develop EMBL partnerships for scientific collaborations & exchange.

Play an active role in European science policy (Research Infrastructure focus).

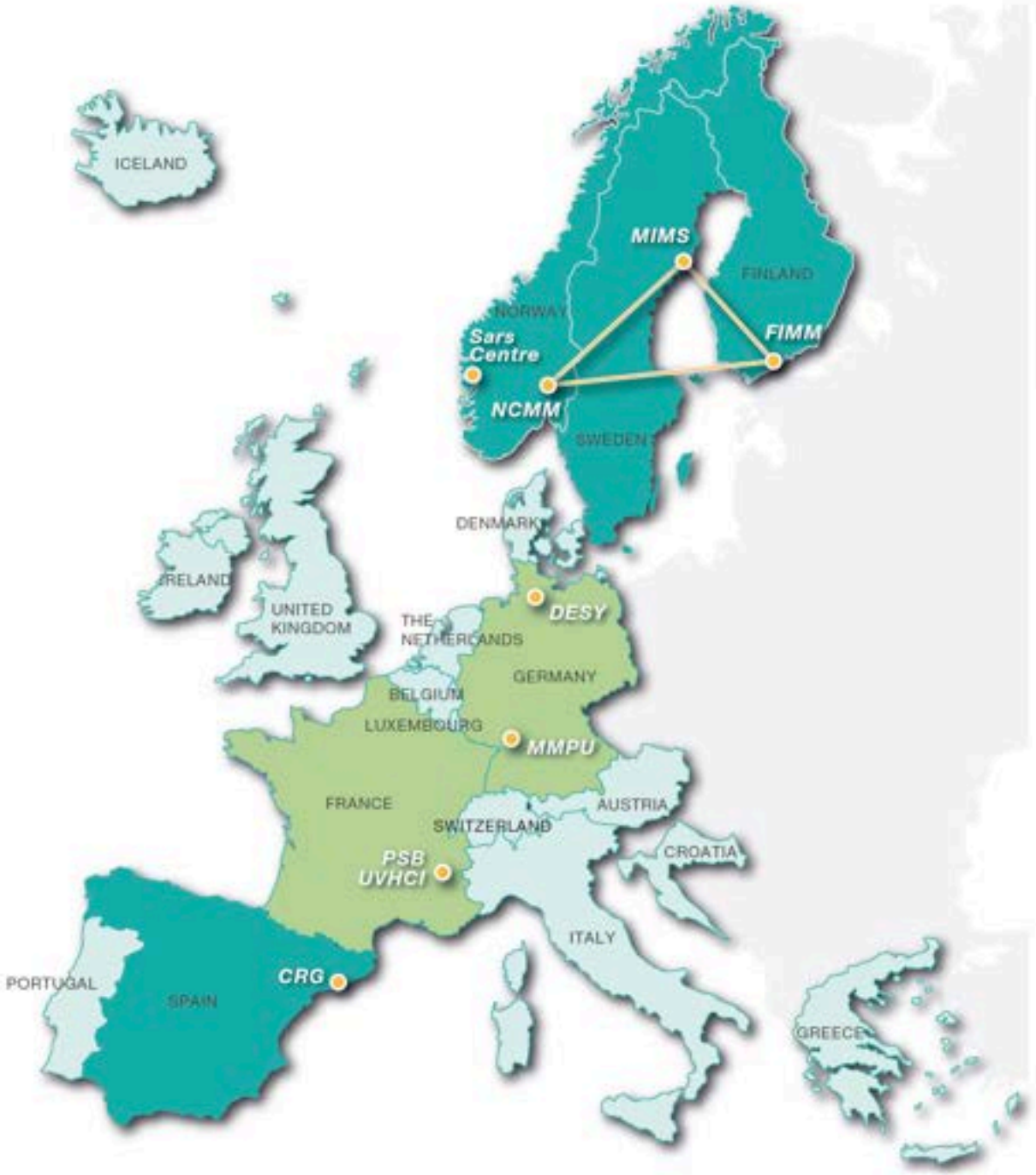
Close interactions with the European Commission.

EMBL Partnerships

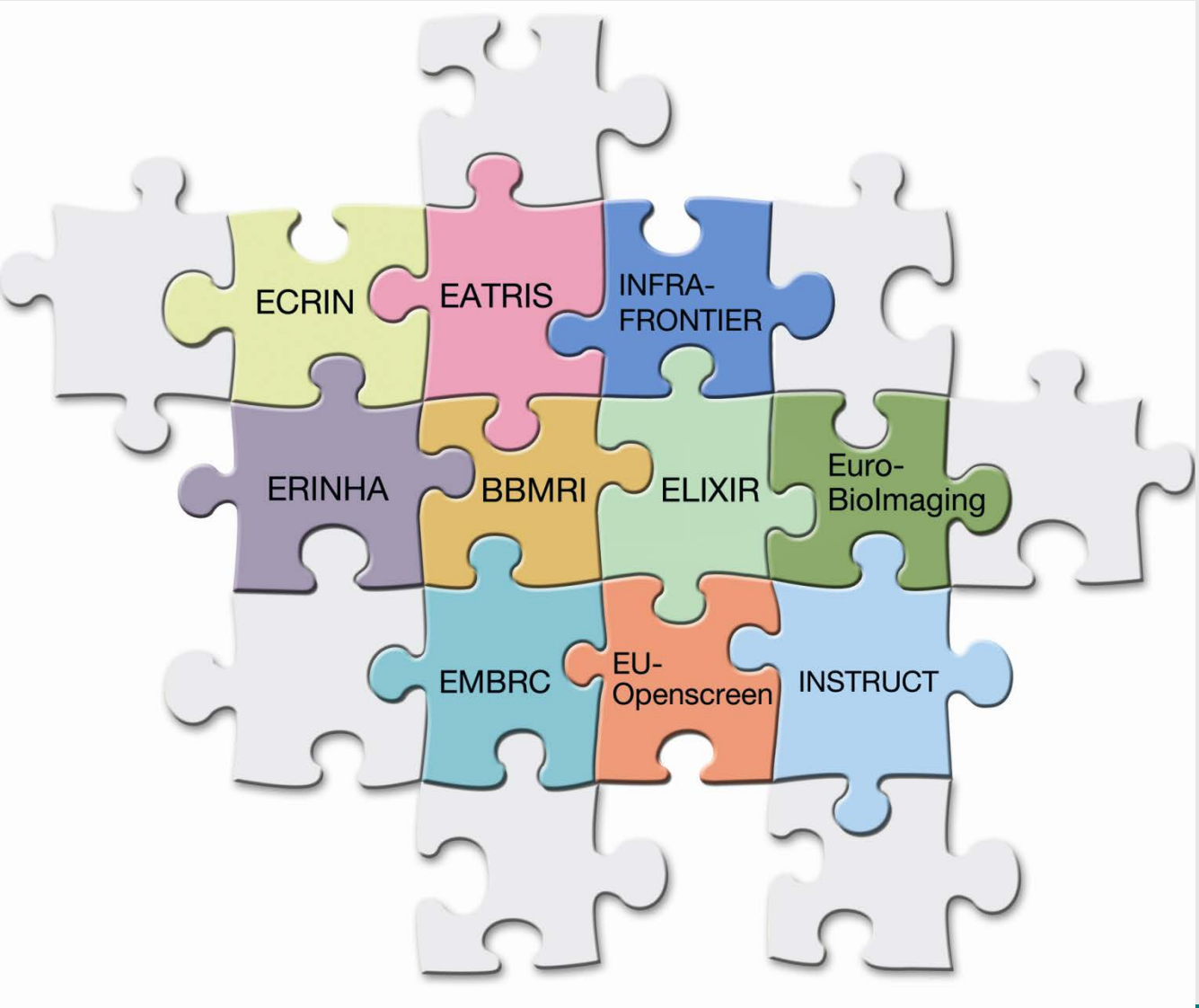


- Special cooperations with national institutions in EMBL member states
- Establish network of international centres of scientific excellence and advanced training modelled on EMBL
- Exploit complementarity or synergy
- Transfer know how
- Implementation varies with local circumstances and national funding
- No net transfer of EMBL resources possible

EMBL Partnerships



ESFRI Biomedical research infrastructures



EMBL

EMBL's role in the BMS projects

- Coordinates ELIXIR and Euro-Bioimaging
- Gives scientific and strategic input into 5 additional projects
- 35 years of experience in running international research facilities that provide services and training
- Profits from experience of other successful RIs unified in EIROforum
- EMBL's responsibility to the member states and the European life science community

ELIXIR

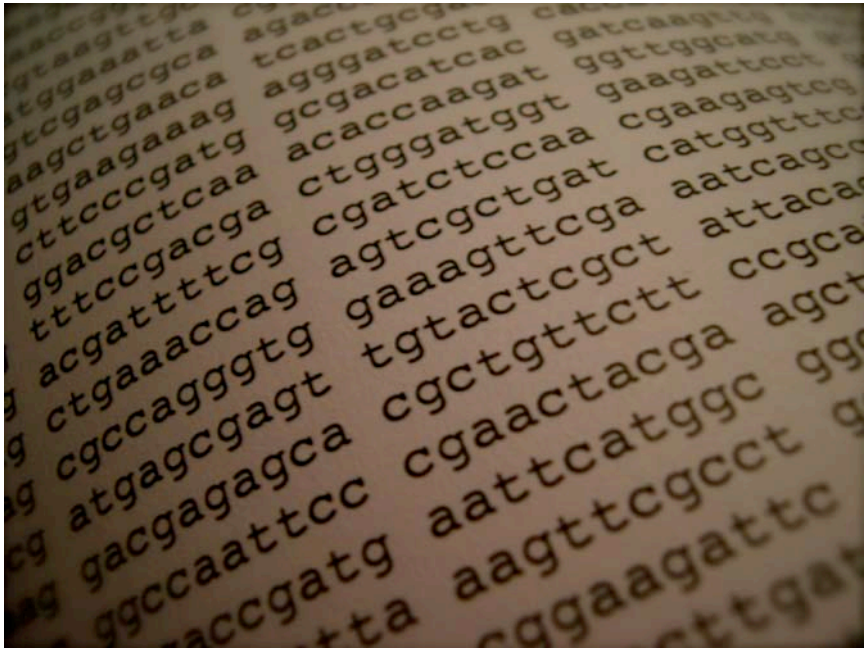
Safeguarding the results of life science research in Europe

European Life Sciences Infrastructure for Biological Information

www.elixir-europe.org

What is bioinformatics?

- The science of storing, retrieving and analysing large amounts of biological information
- An interdisciplinary science involving biologists, biochemists, computer scientists and mathematicians
- **At the heart of modern biology**



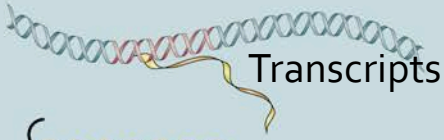
From molecules to medicine

Molecular components

Genomes

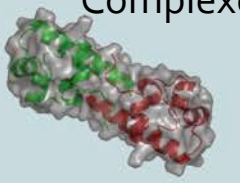
Nucleotides

Transcripts

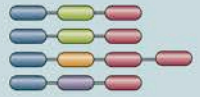


Proteins

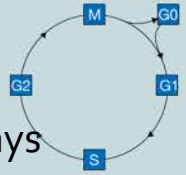
Complexes

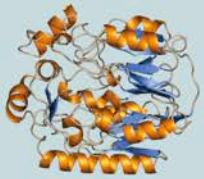


Domains



Pathways





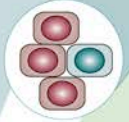
Structures

Small molecules

Integration

Biobanks

Tissues and organs

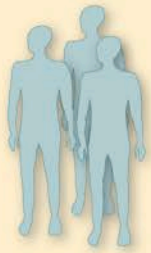


Cells

Human individuals

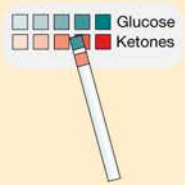
Translation

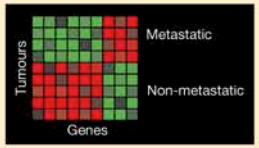
Human populations



Therapies

Disease prevention





Early Diagnosis

What is ELIXIR?

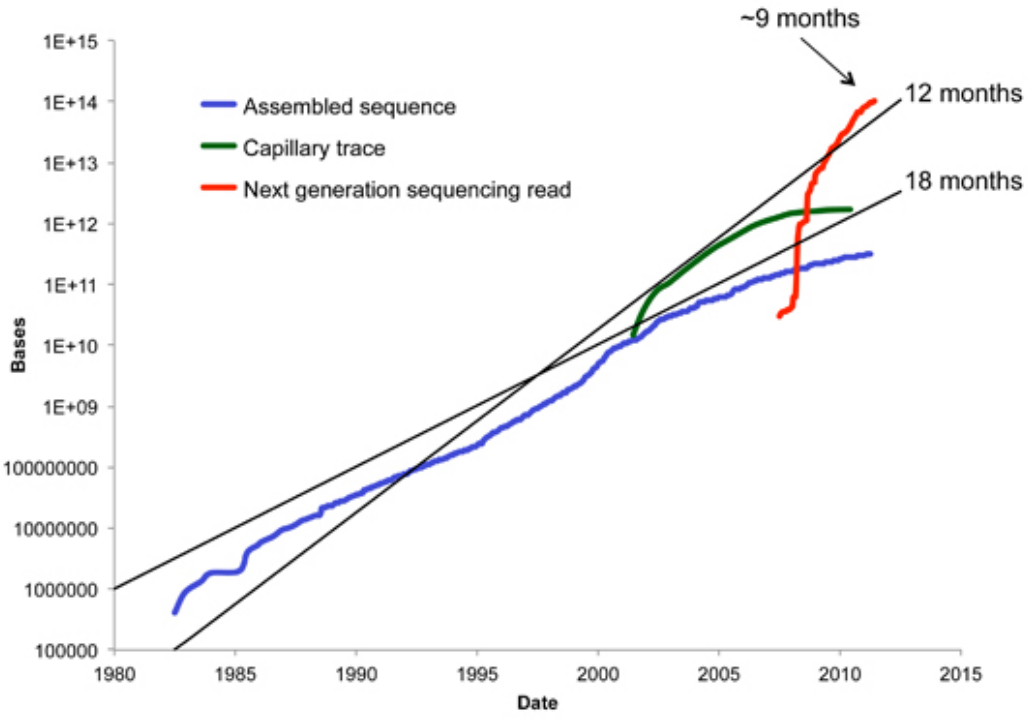
- *An ESFRI research infrastructure of global significance*
- Unites Europe's leading life science organisations in managing and **safeguarding** the vast amounts of data being generated every day by **publicly funded research**.
- A large-scale initiative that will provide the facilities necessary for Europe's life-science researchers to make the most of our rapidly growing store of information about living systems, which is the foundation on which our understanding of life is built.

Why ELIXIR?

- Creating a robust infrastructure for biological information is a bigger task than EMBL-EBI – or any individual organisation or nation – can take on alone.
- Biology has by far the largest research community:
  - ~3 million life science researchers in Europe
  - >6 million web hits a day at EMBL-EBI alone
- We need to involve other European partners

The challenge

- Computer speed and storage capacity is **doubling every 18 months** and this rate is steady
- DNA sequence data is **doubling every 6-8 months** over the last 3 years and looks to continue for this decade



Guy Cochrane, ENA, EMBL-EBI

ELIXIR's mission

To build a sustainable European infrastructure for biological information, supporting life science research and its translation to:

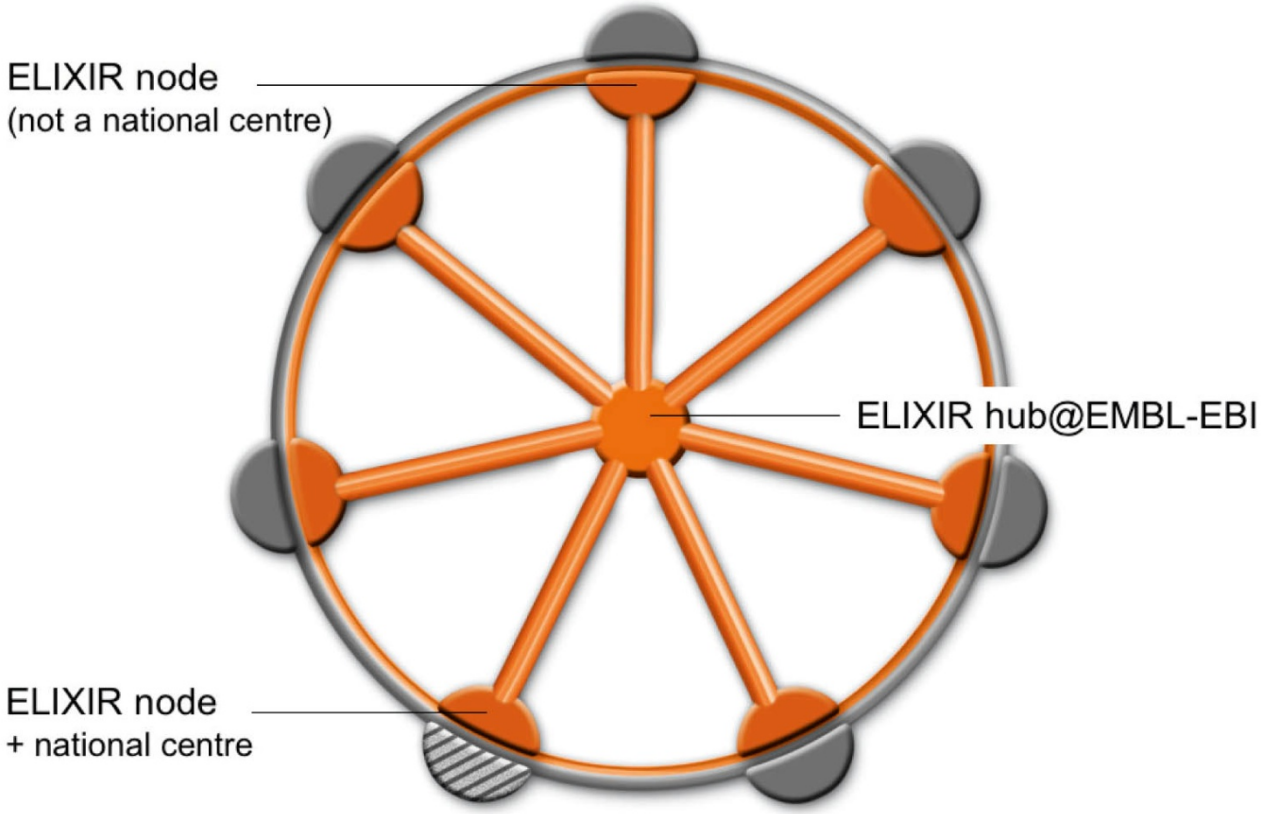
medicine

environment

bioindustries

society

A distributed pan-European infrastructure



Benefits

ELIXIR will contribute to European innovation by:

- Optimising access and exploitation of life-science data
- Ensuring longevity of the data, thereby protecting investments already made in research
- Enhancing the quality of European research by supporting national efforts to increase the competence and number of bioinformatics users through training
- Strengthening the global position and influence of Europe in life-science research in both in academia and industry

The scientific reason for ELIXIR

- Data is an essential commodity for life-science research.
- Ten years ago, finding the connection between a gene and a characteristic (e.g. drought tolerance, risk of heart disease) could take years; now it takes minutes.

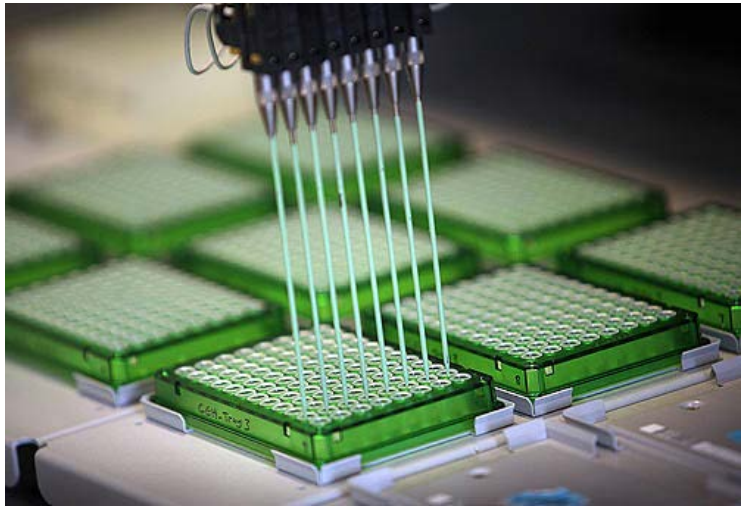


Image courtesy of Genome Research Ltd.

- Data analysis is now the bottleneck in life-science research
- **ELIXIR** is our only realistic hope of easing that bottleneck

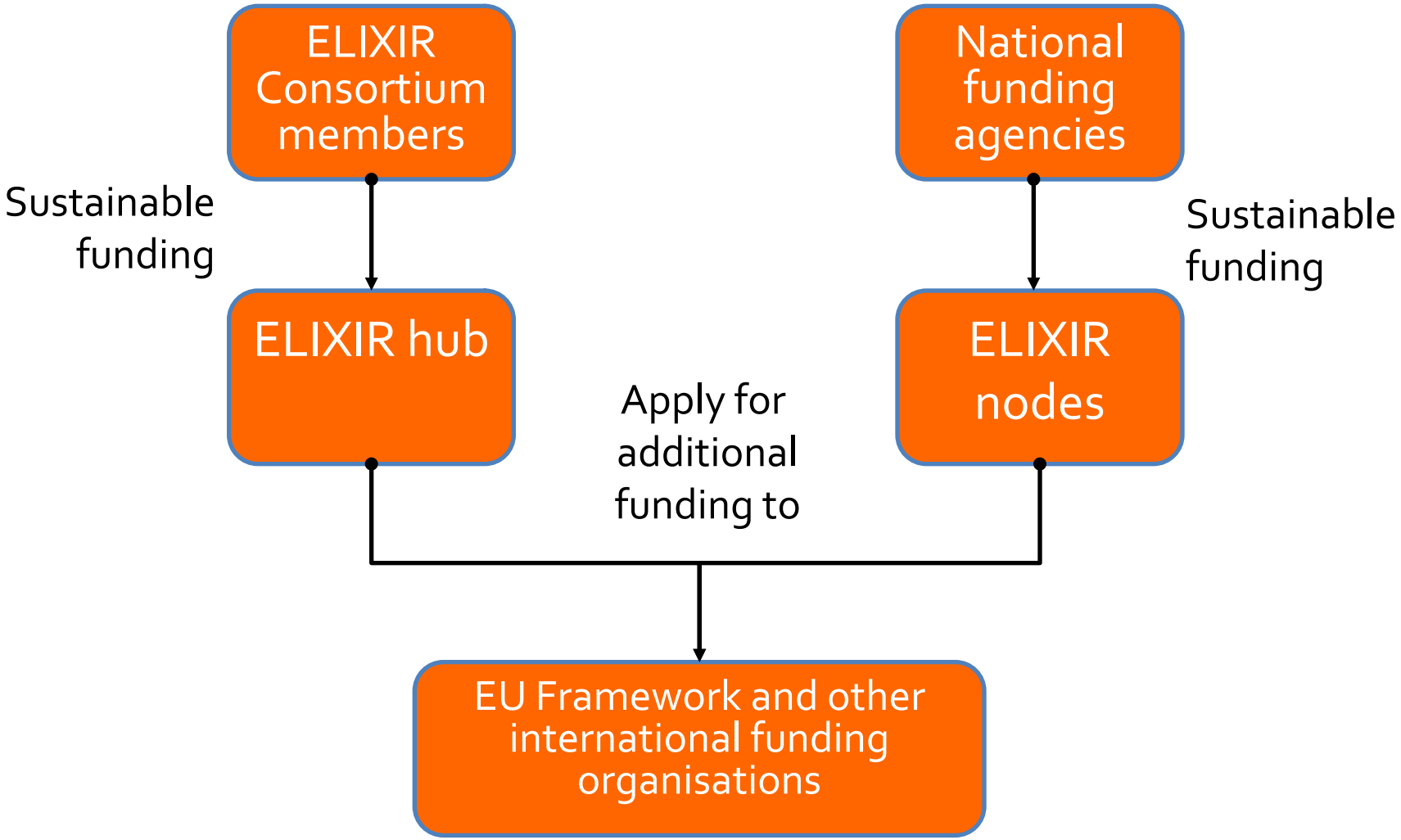
One societal reason for ELIXIR

- The era of personal genome sequencing is upon us.
- Sequence data will not cross national boundaries.
- Every national health system will need **expertise to interpret it** and treat patients accordingly.
- Individuals need to be sure that their personal biological data are in safe hands.

The financial reason for ELIXIR

- Europe has already spent the money to generate the data.
- It will waste all this investment in research if the future of the data is not secured.
- Industry, from SMEs to big multinationals, needs access to public data to analyse its proprietary data.

How will ELIXIR be funded?



Eleven countries have signed up

- 11 countries plus EMBL have now signed the Memorandum of Understanding (MoU) to participate
- More are expected to follow…
- Countries will now work towards signing an International Consortium Agreement (ICA)

ELIXIR Current Status

- ELIXIR Members are currently drafting an International Consortium Agreement (ICA), working towards signing a final version in 2013
- ELIXIR Scientific Advisory Board (SAB) has just been appointed
- Process for reviewing and selecting ELIXIR Nodes will begin in coming months
- ELIXIR Founding Director currently being sought

ELIXIR Current Status (cont.)

- Over €20 million has so far been committed for the construction and operation of national ELIXIR Nodes
- Commitment of €100 million has been made by UK government
- This will go towards a new building on EBI campus, currently being constructed, which will house the ELIXIR Hub, in addition to space in the London Data Centre
- ELIXIR Interim Board has approved an operating budget for ELIXIR Hub for 2012

BioMedBridges EU grant funded

- **Building data bridges and services between biological and medical infrastructures in Europe**
- **Collaboration between all BMS Infrastructure projects**
- **21 partners**
- **Coordinated by EMBL-EBI**
- **10.5 m euros**
- **Start Jan 2012**

ELIXIR Timeline