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)
EMBL History

- EMBL was founded in 1974, as European Intergovernmental Research Organisation following the CERN model.
- Sir John Kendrew was the first Director General (Nobel Prize in Chemistry 1962)
- Nobel Prize in Medicine 1995 awarded to Christine Nüsslein-Volhard and Eric Wieschaus
The Five Branches of EMBL

Heidelberg
Basic Molecular Biology Research Laboratory
Central Administration
EMBO

Hamburg
Structural Biology
DESY

Hinxton
European Bioinformatics Institute (EBI)
Sanger Centre

Grenoble
Structural Biology
ILL, ESRF, IBS, UVHCI

Monterotondo
Mousebiology
EMMA, CNR

>1500 staff
>70 nationalities
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%)
Nationalities in Research Areas

Total: 1,380

D: 311
UK: 246
F: 119
I: 102
E: 67
NL: 24
P: 25
IRL: 22
AUT: 24
CH: 19
GR: 11
HR: 13
FIN: 13
B: 10
S: 9
DK: 8
US: 8
L: 4
I: 2
Non Member: 338
EMBL’s Missions

- Basic Research
- Technology Transfer
- Advanced Training
- European Integration
- Instrument and Technology Development

Services
Biology: From Molecules to Organisms

- **Genome**
- **Protein/DNA**
- **Cell**
- **Embryo**

- **Fruitfly**
- **Mouse**
- **Organism**
EMBL’s citation ranking

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

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

EMBL’s organisational structure serves as a model for research institutions

**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
EMBL – Beyond molecular biology

Physics

Chemistry

Computational Biology

Modelling and Simulation

Medicine
Collaborations between EMBL research groups

2006-2009

EMBL Research Units
- Director’s Research
- Developmental Biology Unit
- Cell Biology and Biophysics Unit
- Structural and Computational Biology Unit
- Grenoble
- EMBL-EBI
- Hamburg
- Monterotondo
- Genome Biology Unit

Joint papers (2006-2009) 
Shared grants (2006-2009)
EIPDQ
Keyword similarity (correlation coefficient) > 0.8 > 0.5

* (n) means new group leaders
EMBL Scientific Core Facilities

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

**Imaging**
- Bridging scales of biological organisation: combine low- and high-resolution techniques
- Biology in four dimensions: live imaging to study dynamic processes in space and time
- Generate quantitative data

**Computational Biology**
- Analysing, integrating and exploiting quantitative data
- Build predictive networks and models of biological processes

**Utilising Next Generation Sequencing**
- Inter-species variation: comparative sequence analysis to study evolution
- Intra-species variation: link genetic variation to phenotype

**Disease Models and Mechanisms**
- Decipher the molecular basis of genetic and infectious diseases
EMBL Services

**Structural Biology**
More than 3,000 users per year

**Bioinformatics**
>5,000,000 web hits per day

Around 450 visiting scientists per year at all EMBL sites
EMBL Services in Structural Biology

- EMBL Hamburg and Grenoble provide access to synchrotron radiation for biological applications at DESY and ESRF

Deposited PDB structures by synchrotron facilities in Europe since 1995 (02.11)
Growth of the key biomolecular data resources at EMBL-EBI

Key challenges:
- Growing data volume
- Data integration
Usage of EMBL-EBI services

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

Idea → Discovery → Protect → ETF*** → Licensing → Start Up Company

* 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 Spin out companies

<table>
<thead>
<tr>
<th>Name</th>
<th>Field</th>
<th>Founding Year</th>
<th>VC Fin. Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lion Bioscience AG</td>
<td>Bioinformatics</td>
<td>1997</td>
<td>Post IPO</td>
</tr>
<tr>
<td>Cenix Bioscience GmbH</td>
<td>RNAi</td>
<td>1999</td>
<td>2nd round</td>
</tr>
<tr>
<td>Cellzome AG</td>
<td>Chem. Proteomics</td>
<td>2000</td>
<td>4th round</td>
</tr>
<tr>
<td>Anadys Inc.</td>
<td>Anti Viral</td>
<td>2000</td>
<td>Post IPO</td>
</tr>
<tr>
<td>Gene Bridges GmbH</td>
<td>Genetic Eng.</td>
<td>2000</td>
<td>-</td>
</tr>
<tr>
<td>EVP Inc.</td>
<td>Neuronal Disorders</td>
<td>2001</td>
<td>3rd round</td>
</tr>
<tr>
<td>SLS GmbH</td>
<td>Software</td>
<td>2002</td>
<td>-</td>
</tr>
<tr>
<td>Hybricore GmbH</td>
<td>HT mAb Prod</td>
<td>2002</td>
<td>seed</td>
</tr>
<tr>
<td>Triskel Ltd.</td>
<td>Oncology</td>
<td>2006</td>
<td>seed</td>
</tr>
<tr>
<td>Elara Pharma GmbH</td>
<td>Oncology</td>
<td>2006</td>
<td>1st round</td>
</tr>
<tr>
<td>BioBytes</td>
<td>Bioinformatics</td>
<td>2008</td>
<td>seed</td>
</tr>
<tr>
<td>Savira Pharmaceuticals GmbH</td>
<td>Anti Viral</td>
<td>2009</td>
<td>seed</td>
</tr>
</tbody>
</table>
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 International PhD Programme (EIPP)

- Created in 1983, can award its own PhD degree (since 1997)
- Joint PhD degree with 29 universities in 19 countries
- 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

PhD defences since 1997
EMBL Advanced Training

2007-2009

>130 events/year across all EMBL sites
10,000 external participants

Financial support from EMBO, EC & Wellcome Trust.
The EMBL ATC in 2010

- **EMBL ATC**: hub for advanced life science training and exchange in Europe
- Opening on 9 March 2010
- In 2010:
  - 37 conferences & meetings
  - 28 courses
- > 6000 participants
- New training formats:
  - EMBO | EMBL Symposia
  - Tailored practical courses
  - Vision 2020 lecture series
EMBL ALUMNI

- > 5000 alumni are EMBL’s strongest asset
- ~3000 alumni with known country of residence
- 81% live in EMBL member and associate member states
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.
EIROforum
Thank you!
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