Challenges for Science and Technology in Europe

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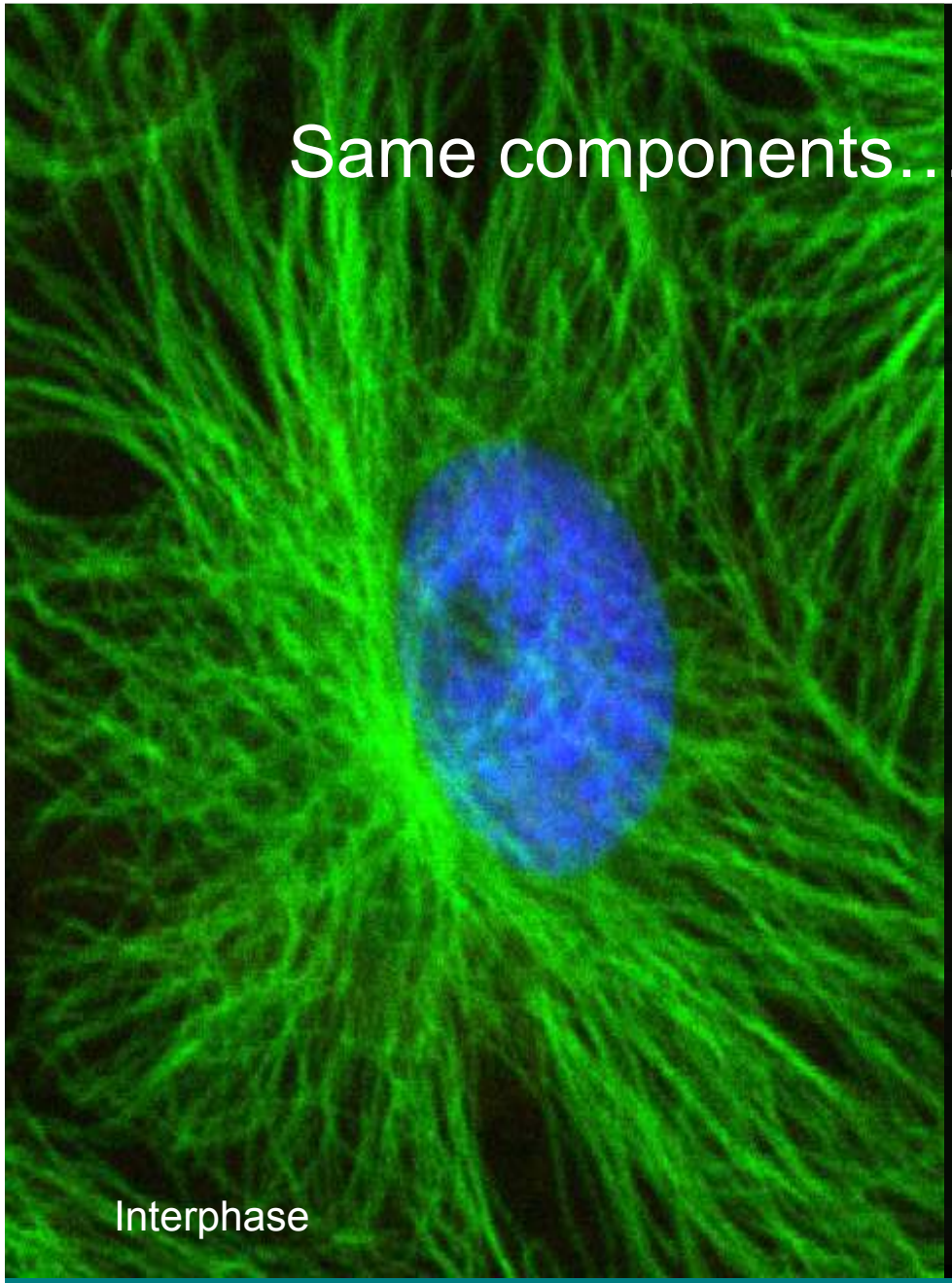
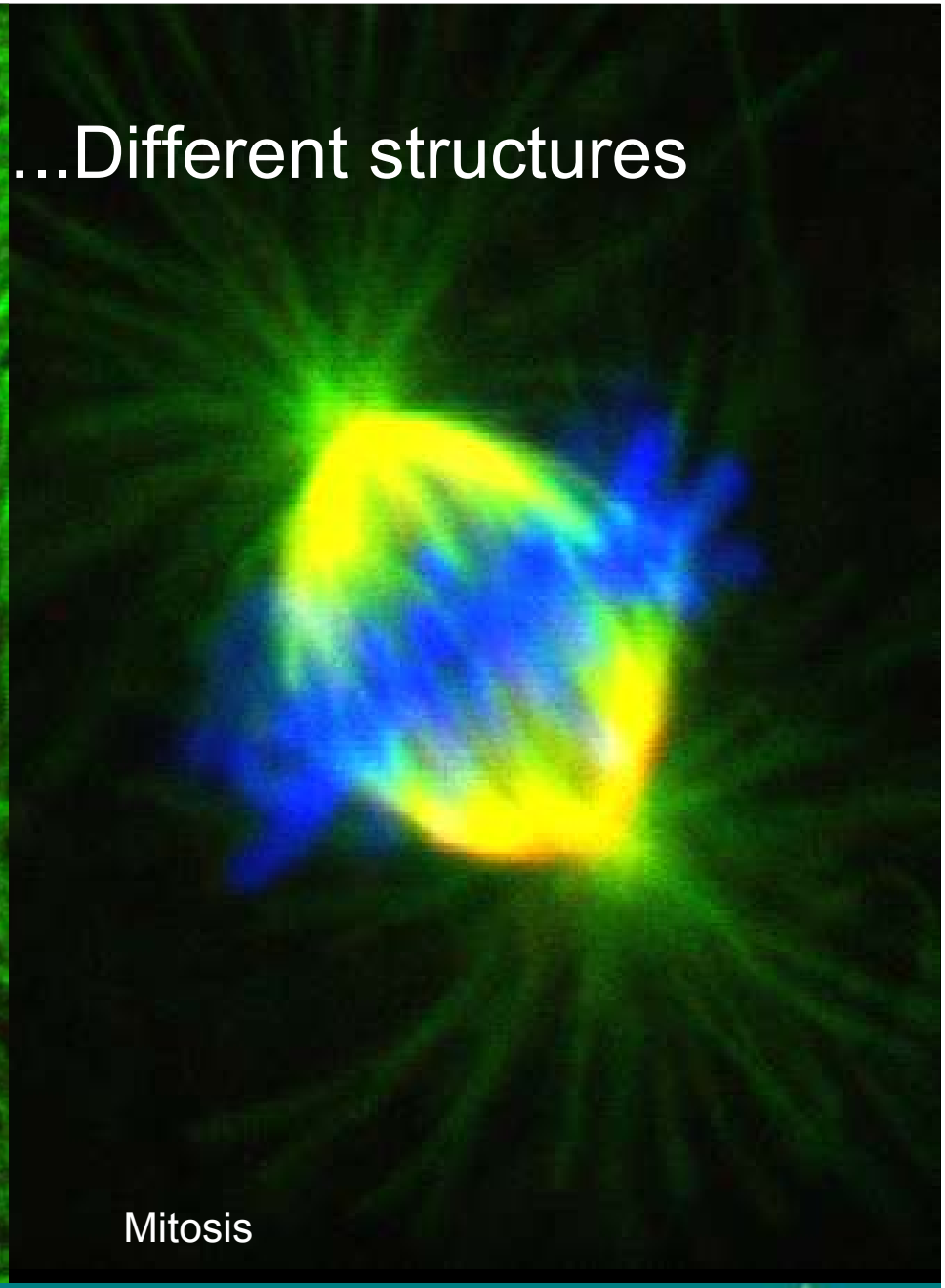
Future of Biomedical Research

- From reductionist to systems approaches
- Interdisciplinary
- High throughput methods generate large amounts of data
- Strong, fast links between basic research and medical application
- Data resources revolutionise biology
- Global collaborations
- Research methods, and thus infrastructures, develop rapidly in this area

Same components…..Different structures



Interphase



Mitosis

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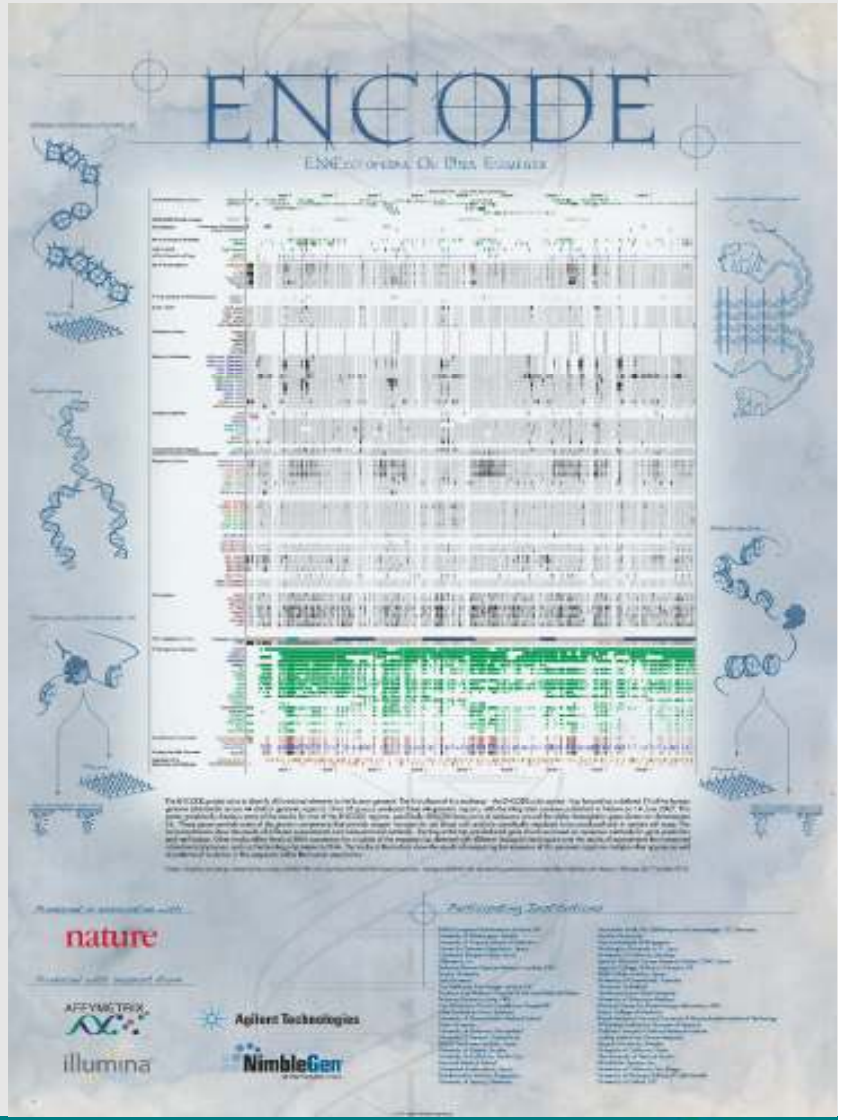
The Encyclopedia of DNA Elements

- Identification of all functional elements in the human genome sequence
- Pilot phase completed: 1% of the human genome sequence
- International consortium of computational and laboratory-based scientists (80 organisations)
- Results of pilot phase provide unexpected findings



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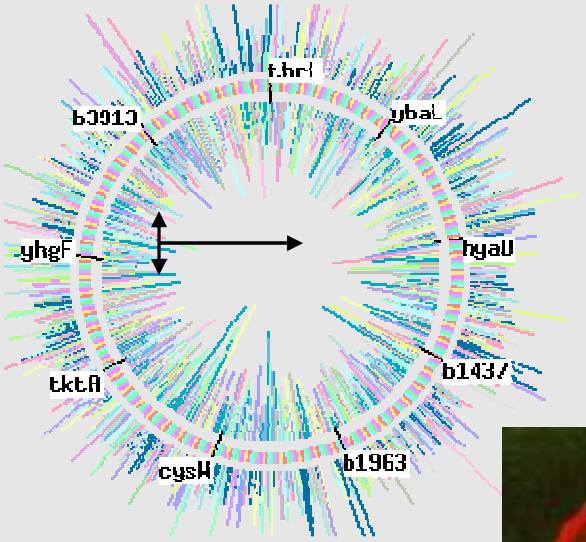
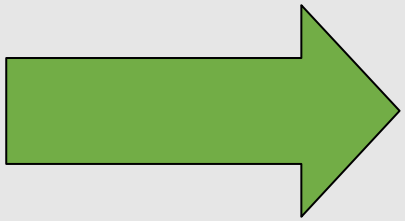
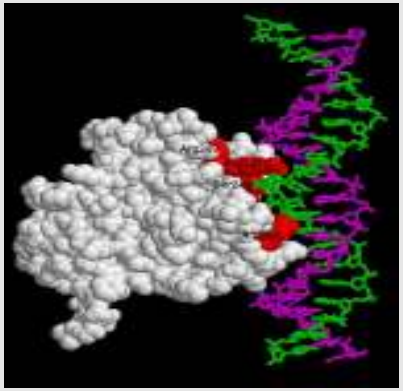
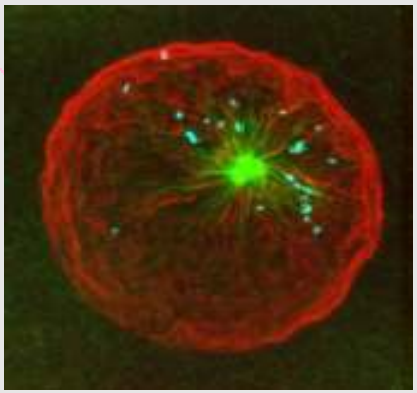
Basic research links to medical applications









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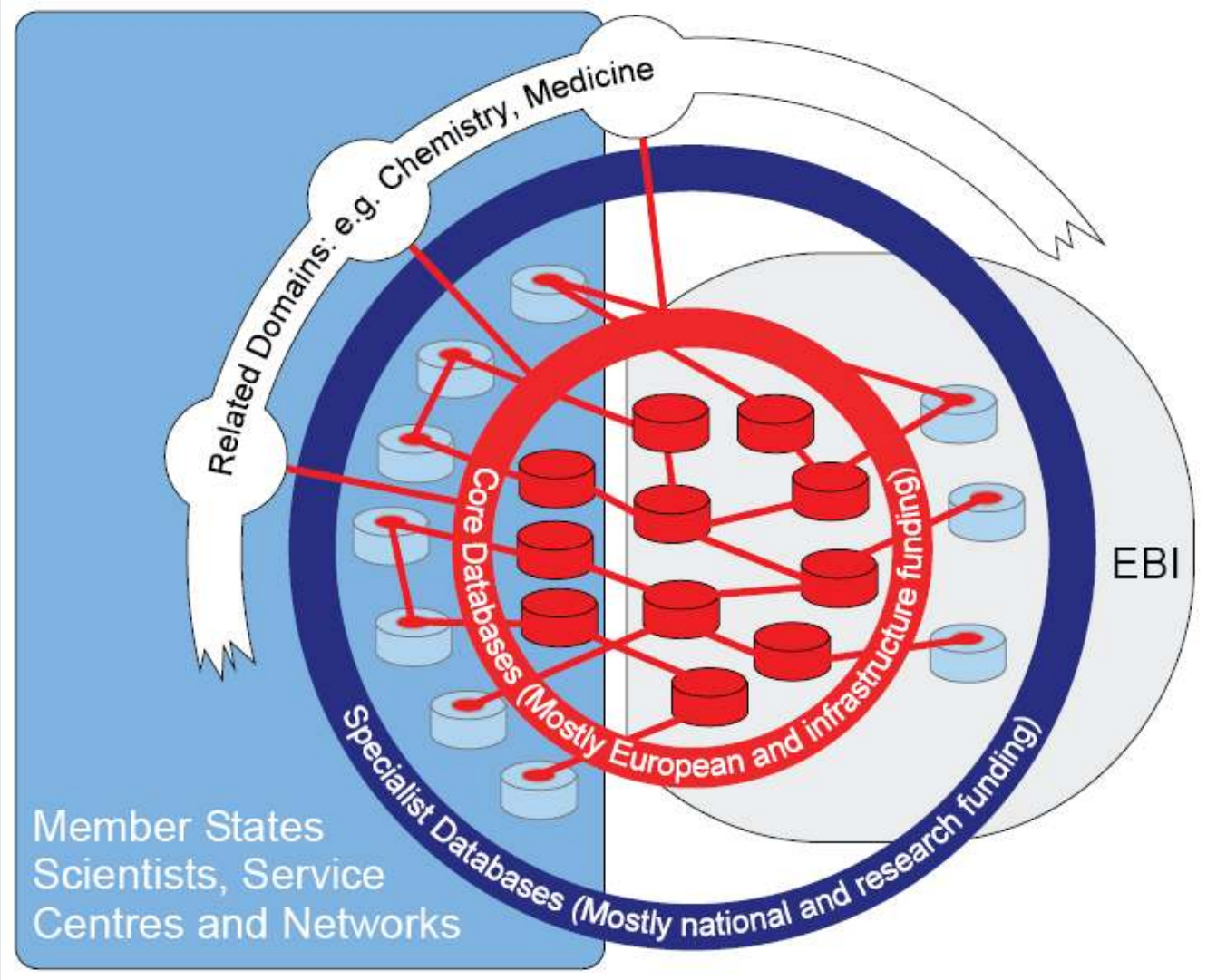
European infrastructure for biological information



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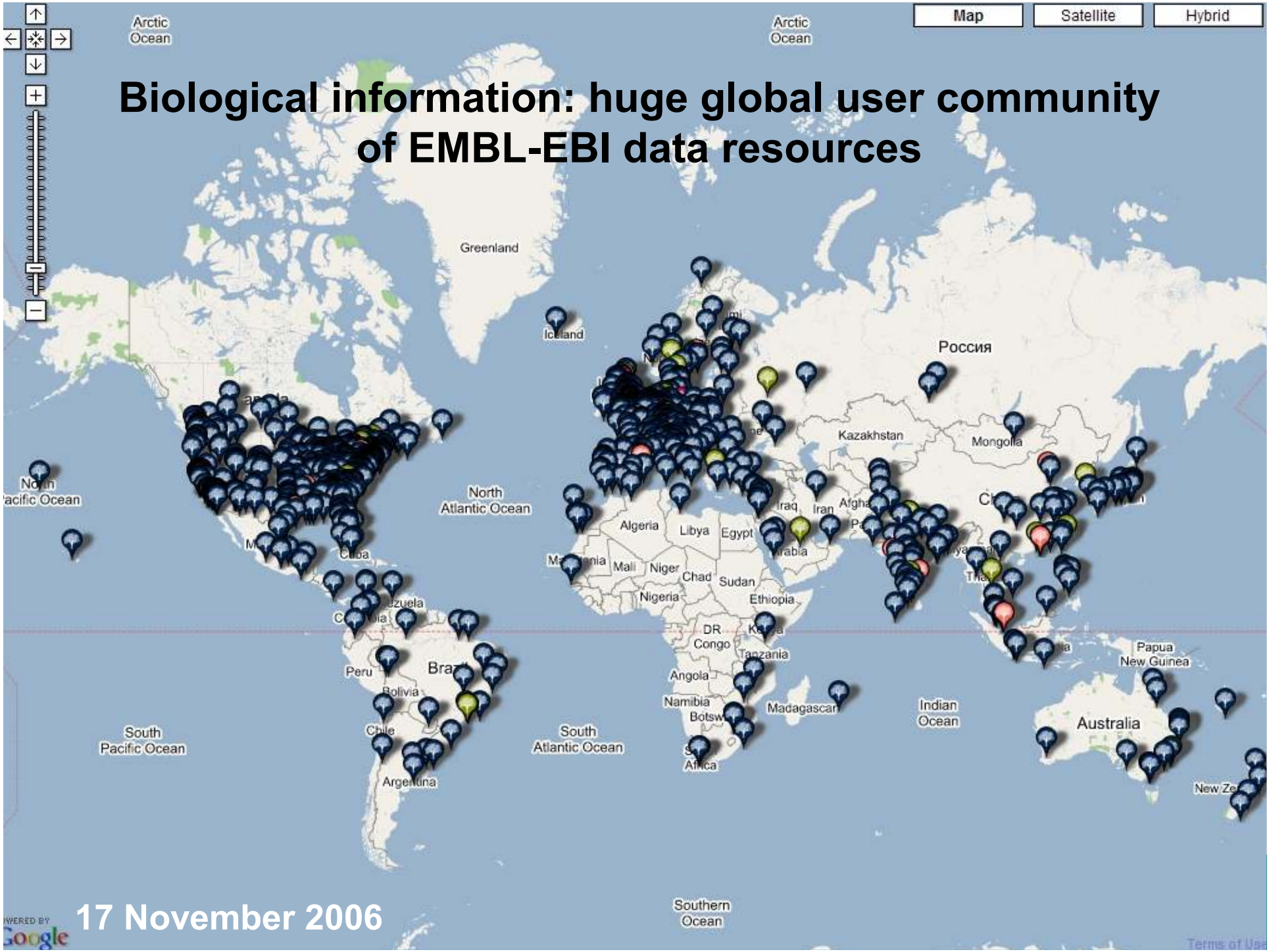
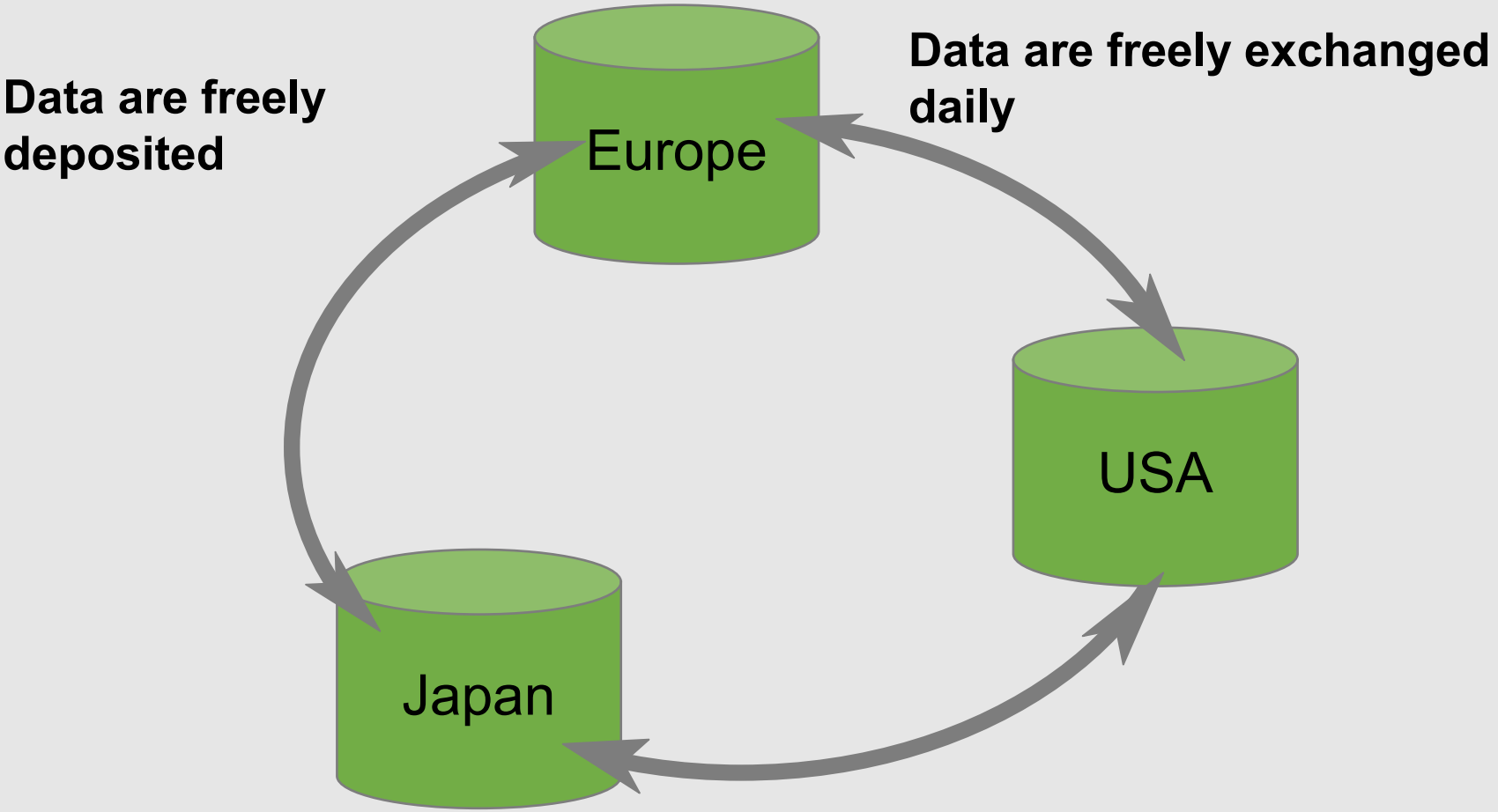

Biological information: huge global user community of EMBL-EBI data resources
Map
Satellite
Hybrid
Arctic Ocean
Arctic Ocean
Greenland
Iceland
Россия
Kazakhstan
Mongolia
North Atlantic Ocean
Algeria
Libya
Egypt
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
Congo
Tanzania
Angola
Namibia
Madagascar
Indian Ocean
Australia
Papua New Guinea
South Pacific Ocean
South Atlantic Ocean
Peru
Bolivia
Chile
Cuba
Southern Ocean
17 November 2006
Google
Terms of Use

Global collaborations: biological information



What is needed?

- New Life Science Infrastructures
- Flexible GRID architectures
- European coordination of priorities
- European legal, funding and governance structures
- Flexibility in updating roadmap
- European ERC-like body to coordinate implementation of RIs

Next generation of Biomedical Research Infrastructures

- Facilities for systems and synthetic biology
- Biomedical imaging
- Chemical biology facilities
- Advanced light microscopy
- High security laboratories

European success models