

Sattellite research infrastructures

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Optimal conditions for a successful scientific programme
in life sciences:

1. Excellent people

**2. Sufficient running funds and a well-equipped
laboratory**

3. Access to research infrastructures.

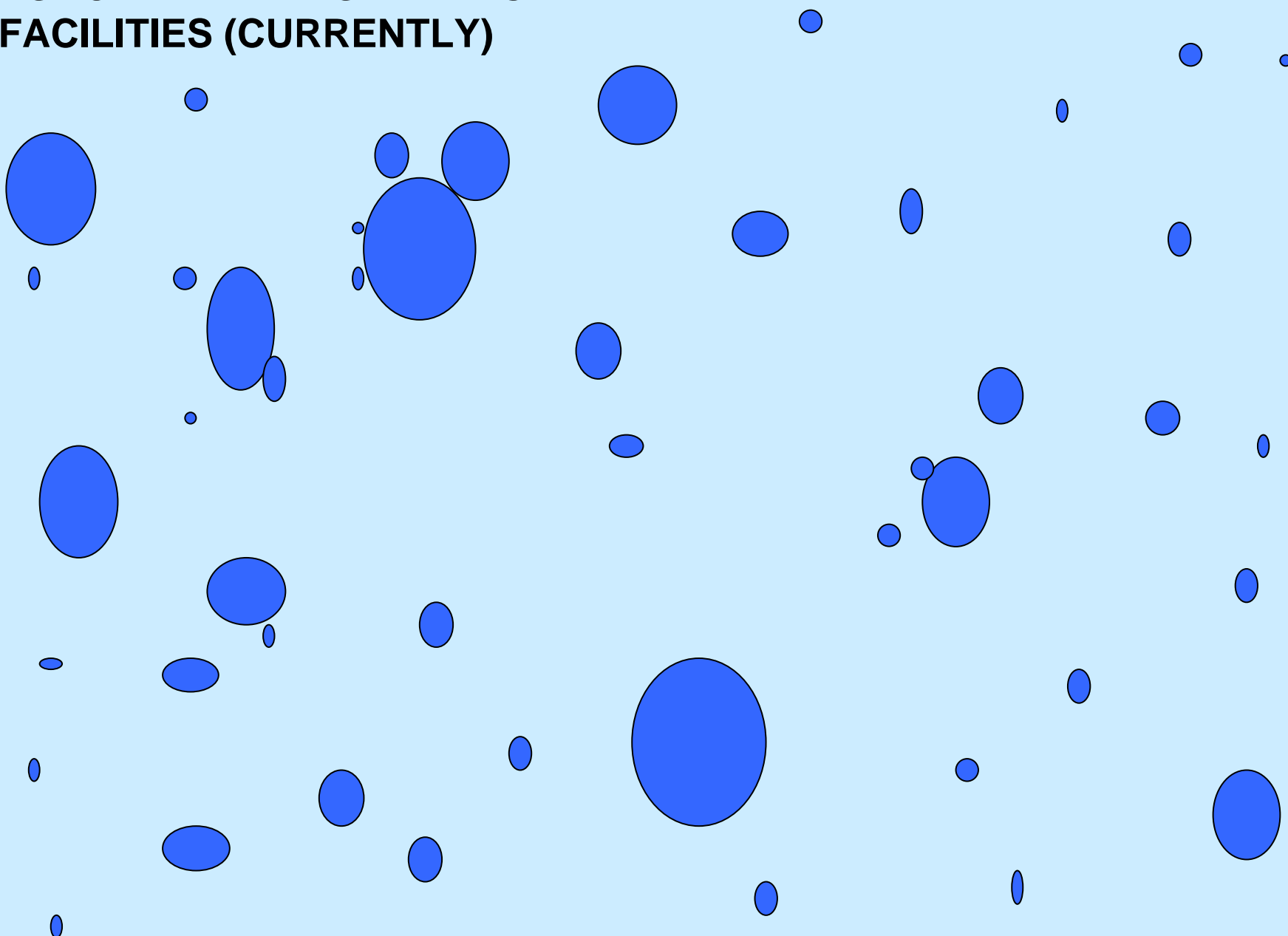
Life sciences research infrastructures characteristics:

1. Not excessively expensive, except some of the more „physical” fields, e.g. structural biology which require X-ray sources
2. Coordination of many distributed resources: bio-banks, medical registers, genomic and proteomic data, field observations, etc.
3. Typically involving large numbers of researchers working in well-equipped laboratories.

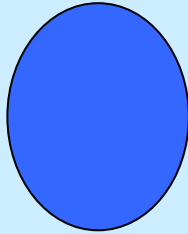
Spending on Biomedical Research as % of total Research Funding (stimulating the modern knowledge based economy):

- Australia 66%
- USA 55%
- EU average 25%
- Poland <20%

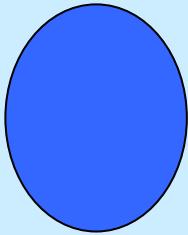
EUROPEAN MEDIUM AND SMALL FACILITIES (CURRENTLY)



Examples of existing medium size infrastructures:



European Bioinformatics
Institute (EBI)
Sanger Centre



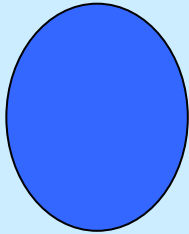
Heidelberg



EMBL, Basic research in molecular biology,

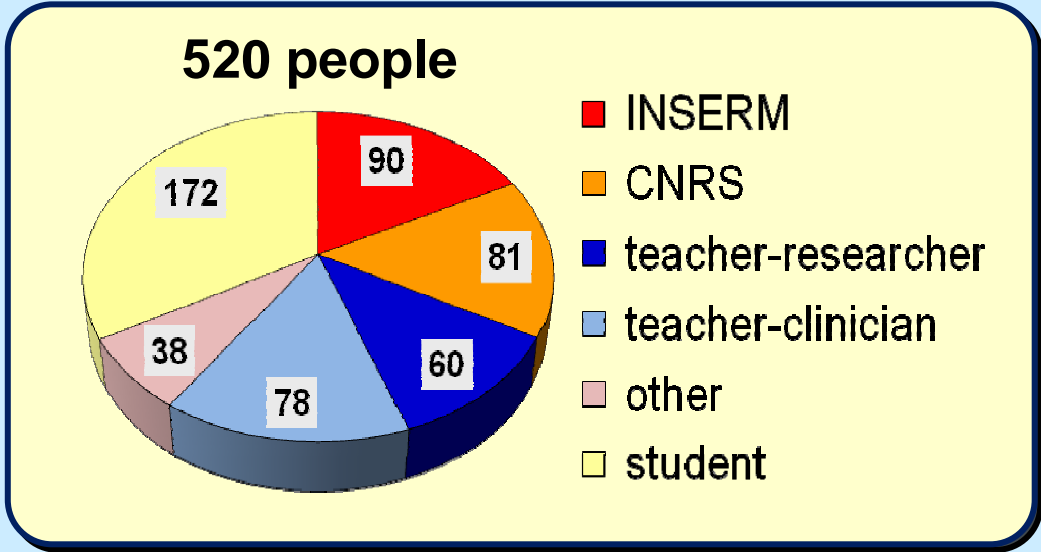
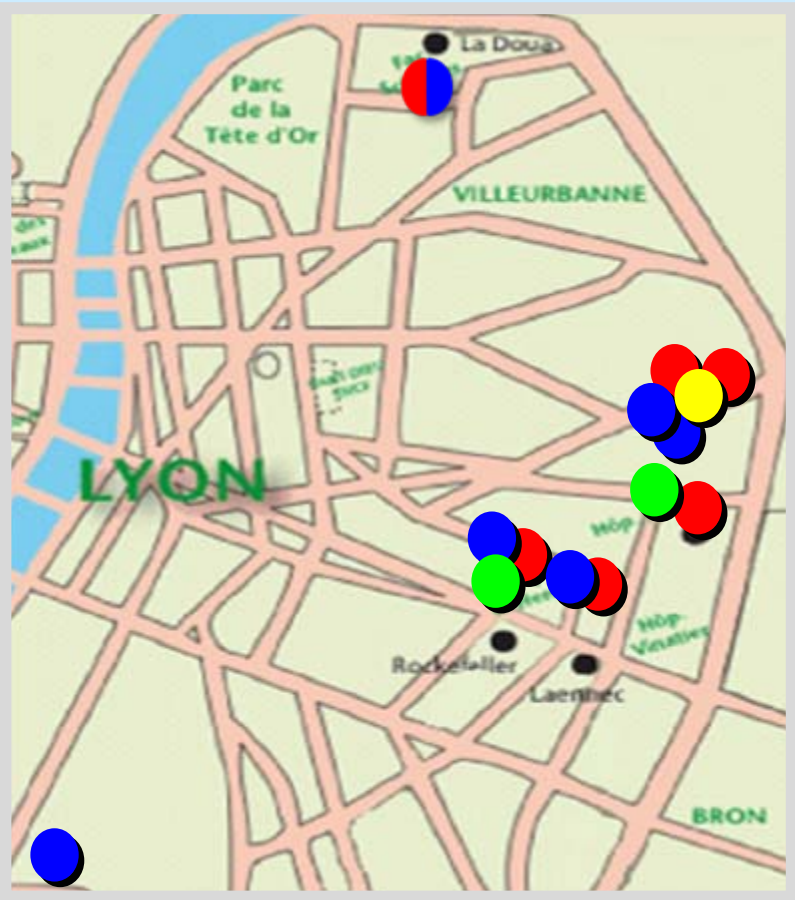
EMBL Scientific Core Facilities:

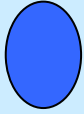
1. Advanced Light Microscopy
2. Chemical Biology
3. Electron Microscopy
4. Flow Cytometry
5. Transgenics
6. Genomics
7. Proteomics
8. Protein Expression & Purification
9. Monoclonal Antibodies



A structured network of 13 labs:

- 5 INSERM labs
- 5 CNRS labs
- 1 INSERM/CNRS/INSA lab
- 2 Lyon1 University labs
- common services





The example of existing small size infrastructures:

The Ochota Campus*

14 scientific institutions in one square kilometre:

• **Polish Academy of Sciences** :

Nencki Institute of Experimental Biology, Institute of Biochemistry and Biocybernetics and Medical Research Centre, International Institute of Cellular and Molecular Biology.

Biophysics, Institute

• **Warsaw University**: Faculties of Biology, Chemistry, Physics, Mathematics

• **The Medical University of Warsaw** and the largest clinical hospital in Poland.

• Total employment > 5500;

➢ research scientists > 1500 (~50% in bio-sciences)

➢ PhD students > 1000 (~50% in bio-sciences)

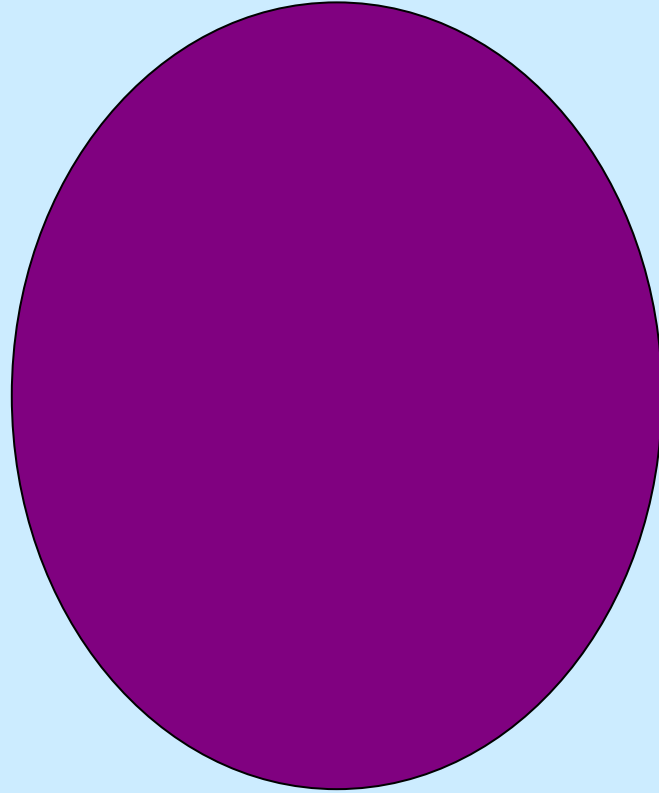
• Total annual turnover > 50 million euro

• Total assets > 150 million euro



* Ochota is one of the central districts of Warsaw

BIG FACILITY (PLANNED)

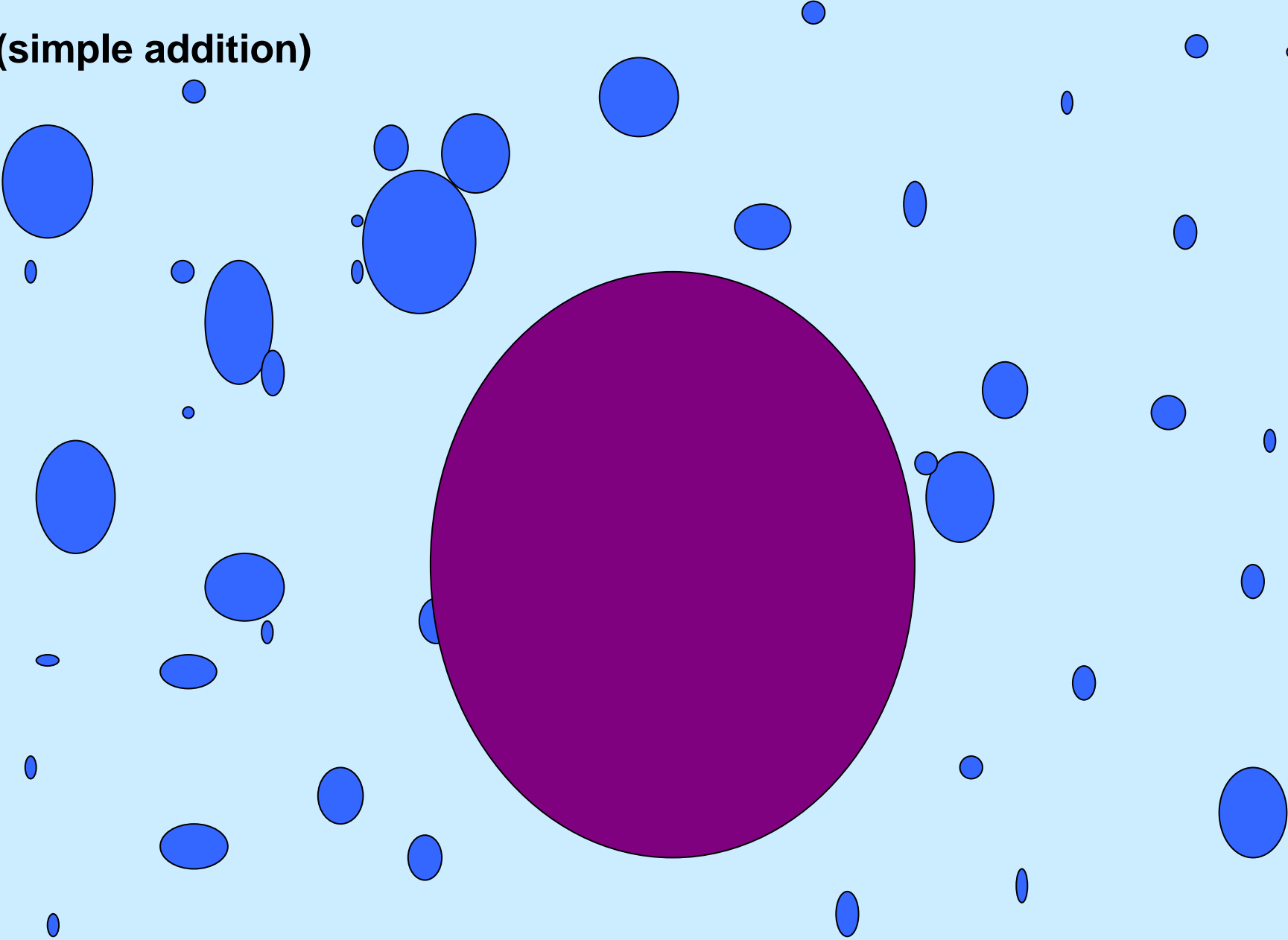


Big Infrastructure Principles (Good Research Infrastructure Practice - GRIP)

- International Advisory Board
- All positions filled through competition procedure
- Group leader (Professor) selection procedure:
 - international competition
 - required PhD and significant recent publication index
 - ability to raise extramural funding
- Contract employment for all employees
- Regular evaluation of group leaders by Commission of Scientific Reviewers

LARGE, MEDIUM AND SMALL FACILITIES

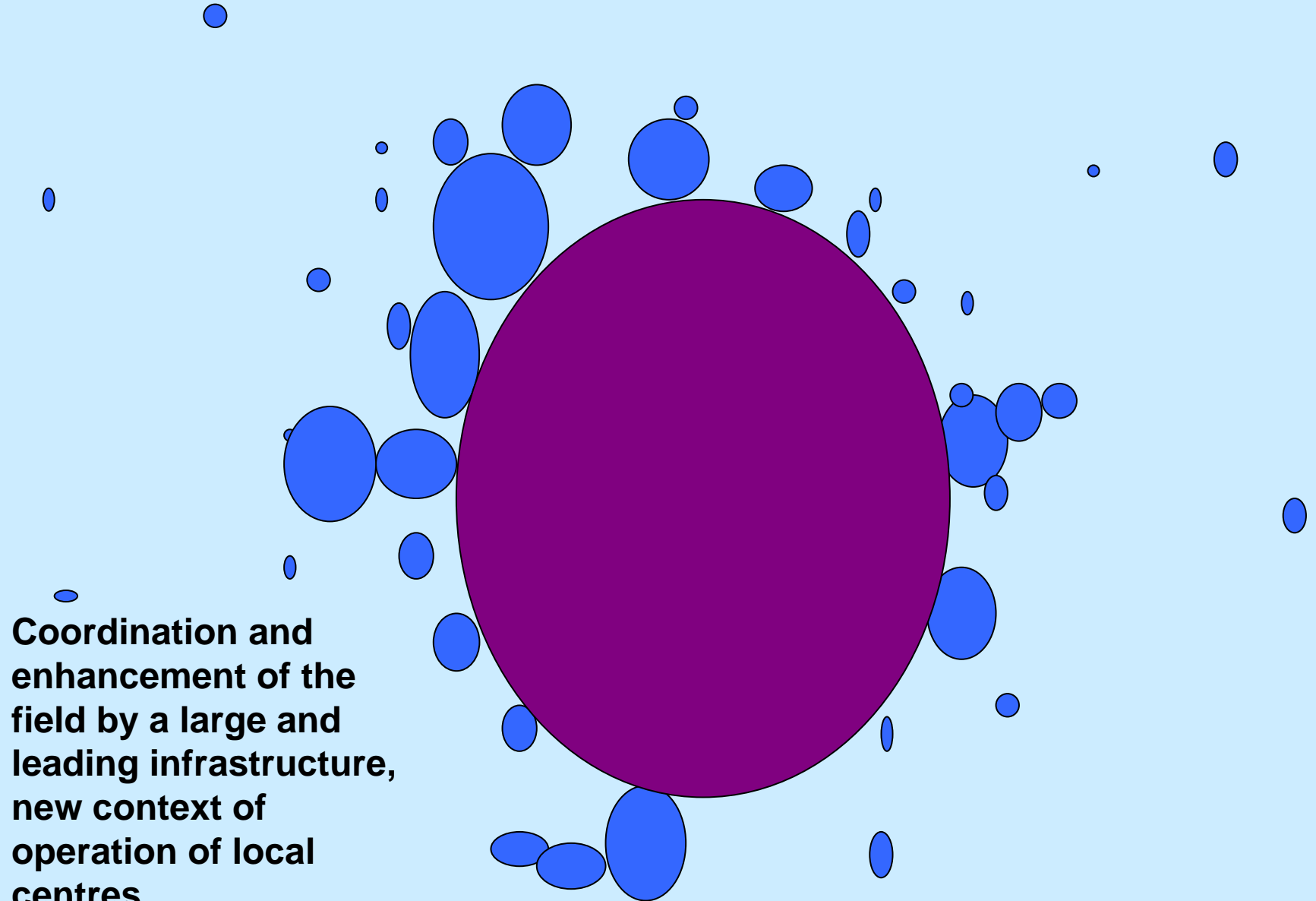
(simple addition)



Whats is the future of current infrastructures when a big facility arrives:

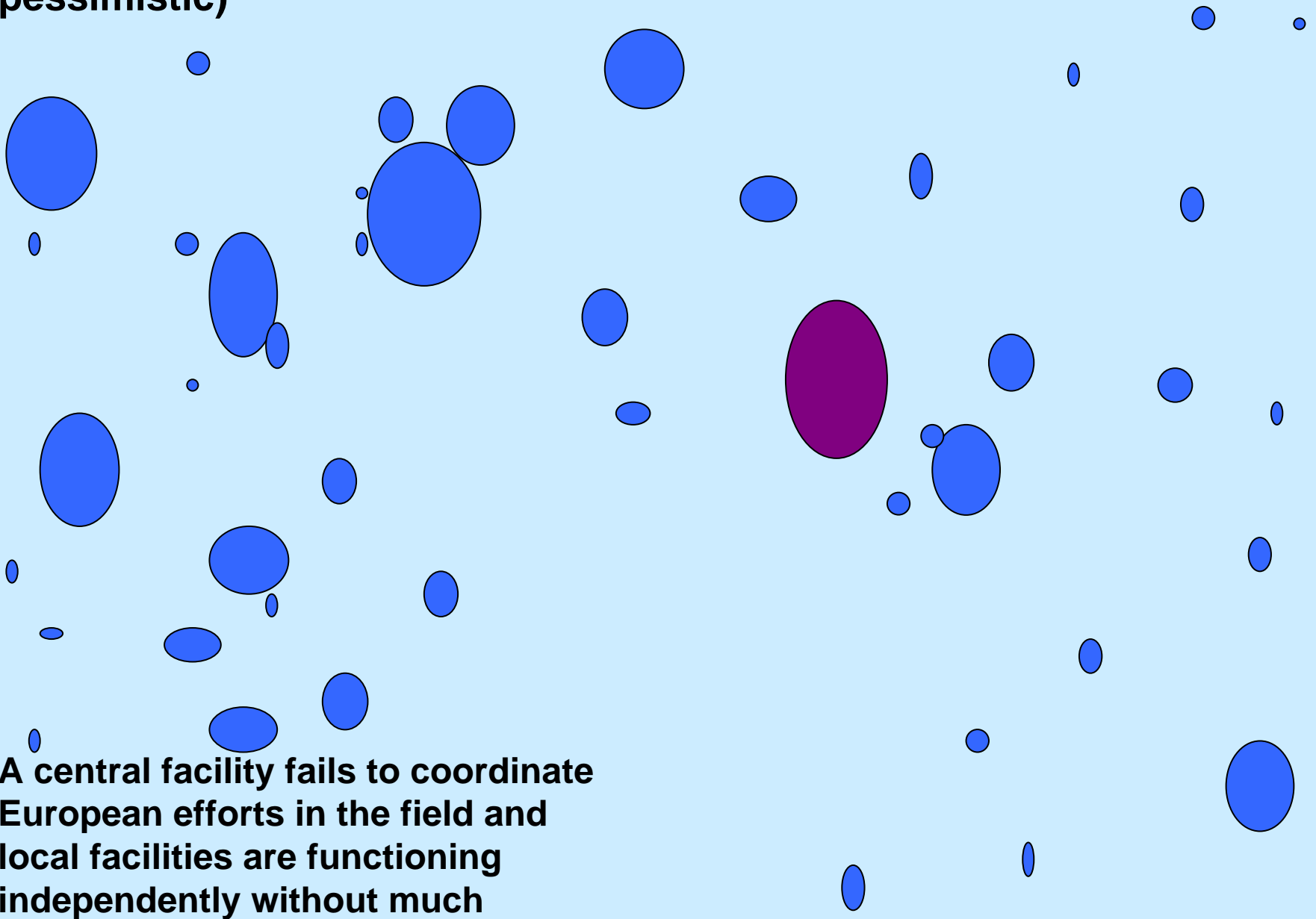
3 possibilities.

LEADING, MEDIUM AND SMALL FACILITIES (variant 1)



Coordination and enhancement of the field by a large and leading infrastructure, new context of operation of local centres.

LARGE, MEDIUM AND SMALL FACILITIES (variant 3, pessimistic)



A central facility fails to coordinate European efforts in the field and local facilities are functioning independently without much change.

Which variant is our goal?

Variant 1.

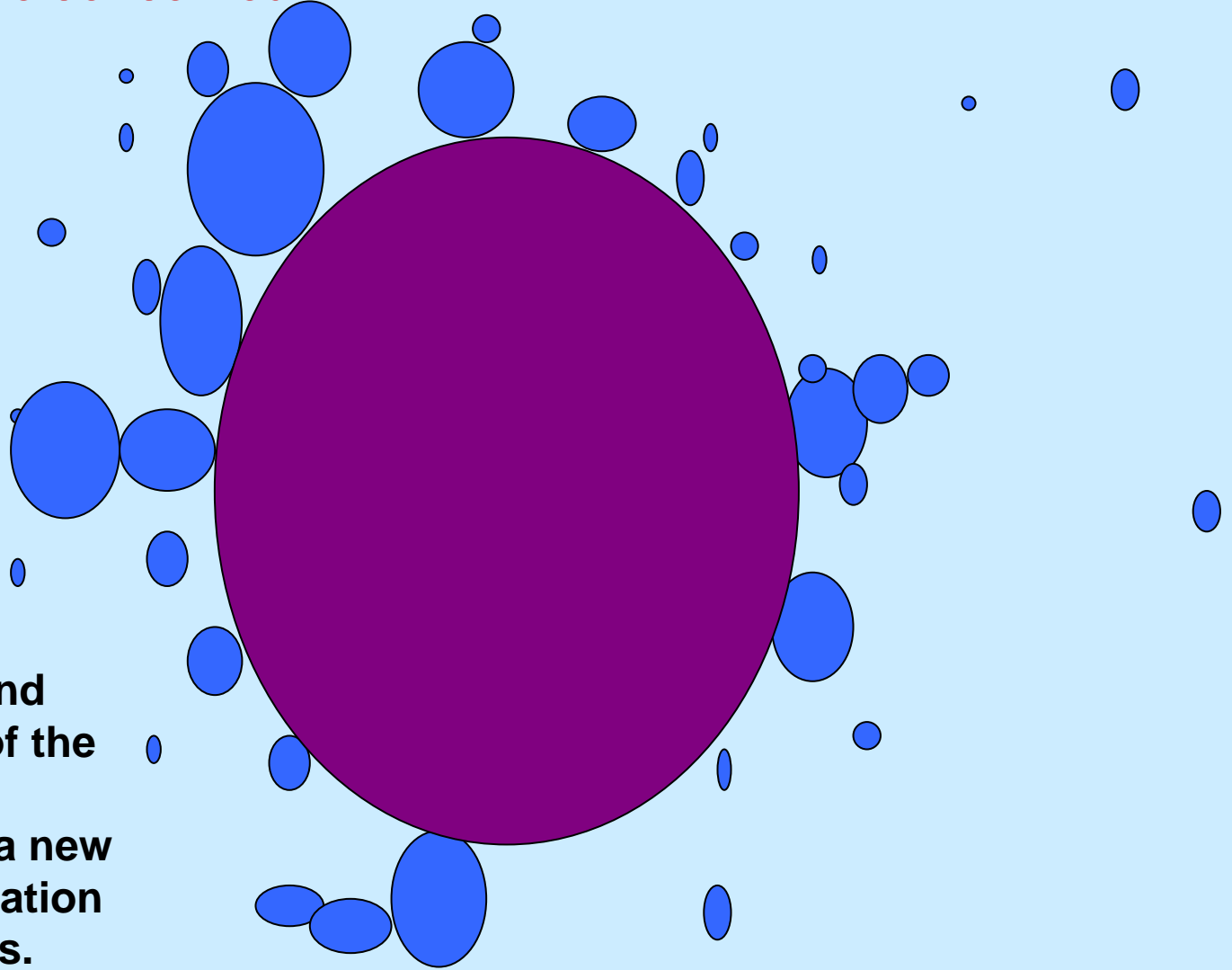
**Coordination and enhancement of the field by a leading infrastructure;
a new context of operation of local centres.**

Variant 2

A dominant position of a central facility and reduction of local centres.

LEADING, MEDIUM AND SMALL FACILITIES COORDINATED NETWORK

Field reaches critical mass when human resources and technical possibilities are concerned.



Coordination and enhancement of the field by a big infrastructure, a new context of operation for local centres.

To achieve this critical mass, when human resources, mobility and technical possibilities are concerned, a strong coordination and synchronization of infrastructural efforts in Europe are needed.

Harmonization of:

1. EU scientific programmes (FP7 and following FPs, mobility human resources, capacity building and maintenance programmes, etc.)
2. National research programmes
3. European and national R&D infrastructure plans (ESFRI and national roadmaps) .

12 „new members”

Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Malta, Poland, Slovakia, Slovenia (since May 1st, 2004), Bulgaria and Rumunia (since January 1st, 2007) are new members of EU.

Cohesion funds (2007 – 2013 + 2)

Population	10⁹ €
Poland (38,6 mln)	59,7
Czech Republic (10,2 mln)	23,7
Hungary (10,0 mln)	22,5
Rumunia (22,3 mln)	17,3
Slovakia (5,4 mln)	10,3
Lithuania (3,6 mln)	6,1
Bulgaria (7,8 mln)	6,0
Latvia (2,3 mln)	4,1
Slovenia (2,0 mln)	3,7
Estonia (1,3 mln)	3,1
Malta (0,4 mln)	0,8
Cyprus (0,8 mln)	0,6
∑ 104, 7 mln	∑ 157,9 mld €

Population of new members countries Σ **104,7 million**

Cohesion/Structural funds Σ **157,9 billion €**

Assuming that ca. 2,5 % of these funds will be directed to innovative science,

Spending on R&D from cohesion funds in 12 new members states will amount in years 2007 - 2013 to 4 billion €

„Implementing the ESFRI roadmap would cost € 14 bn over 10 years. Despite the increase in funding allocated to infrastructures in the 7th research Framework Programme and the possibilities for infrastructure-support in less developed regions under cohesion policy programmes, **the EU budget is not big enough to provide core financing for the construction of new pan-European infrastructures, in addition to supporting open access to infrastructures of European interest and stimulating their coordinated development and networking.** ”

Brussels, 4.4.2007

COM(2007) 161 final

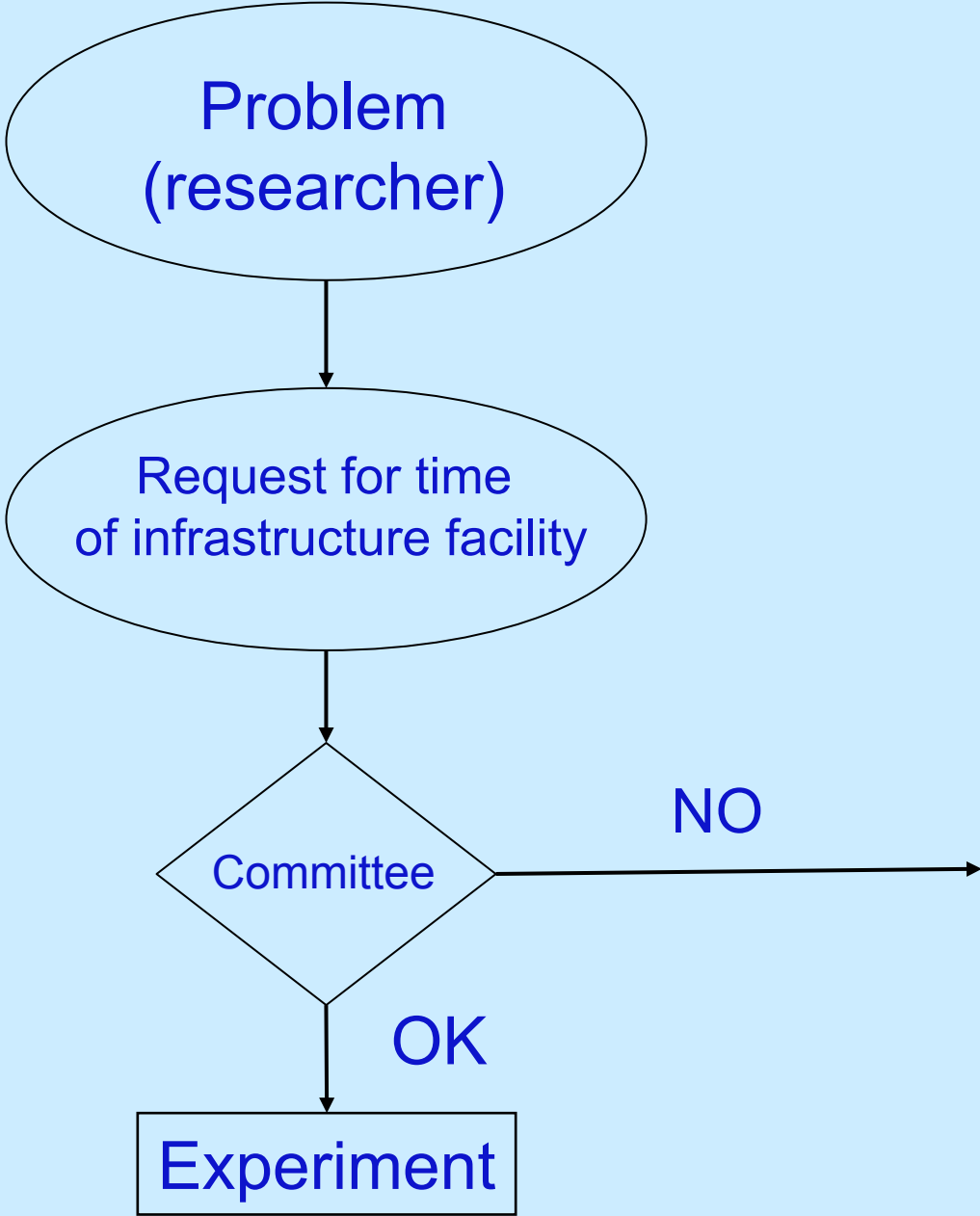
GREEN PAPER

The European Research Area: New Perspectives

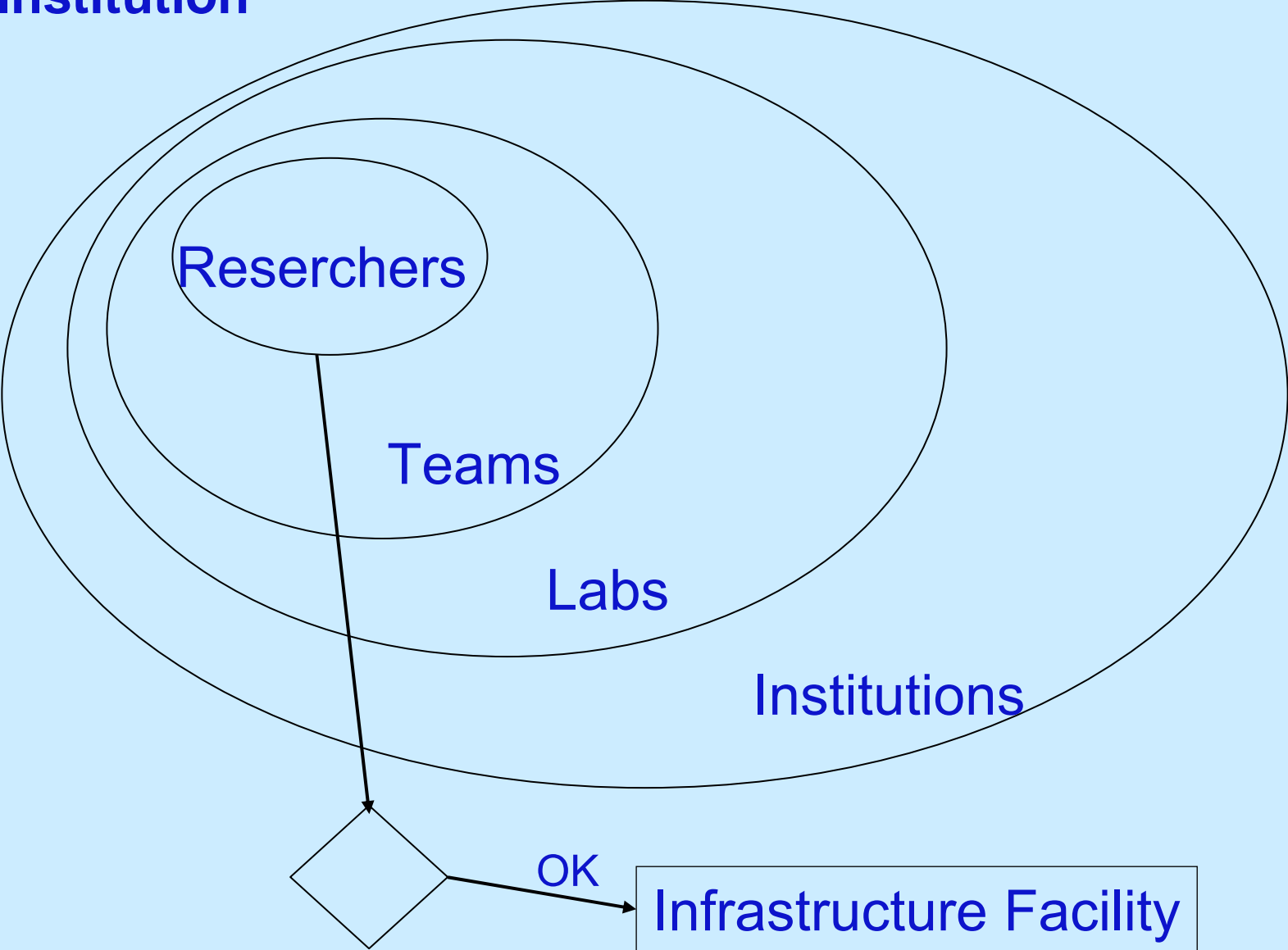
(Text with EEA relevance)

CONCLUSIONS:

- 1. In Life Sciences maximizing human potential is the most critical factor of success, therefore a model of distributed thematic research infrastructures (RI) will offer the most effective mechanism of providing RI access to the largest number of talented research teams.**
- 2. The most effective model seems to be that of a network coordinated by a leading centre with the role of coordinating access and development of the network as a whole**
- 3. Developing organizational and management models for such distributed infrastructures with large, medium size and small facilities all networked and coordinated by the leading facility should maximize their sustainability and growth, maximizing the scientific output of the research community they serve.**
- 4. Common evaluation procedures for new permanent and lab leader positions should be implemented according to the leading centre example (e.g., EMBL model). These selection of best scientists should be applied based on the same general principles to all satellite facilities.**



Big Infrastructure Facility Independent of a Particular Institution



Big Infrastructure Facility Integrated with a Scientific Institution

