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# *Building the Europe of Knowledge*

## Health Research

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*European Commission  
Health Research Director*

March 2006



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# General figures: research in Europe

Health research in the *6th* Research Framework Programme 2002 - 2006

The *7th* Research Framework Programme 2007 - 2013

Health research in FP7

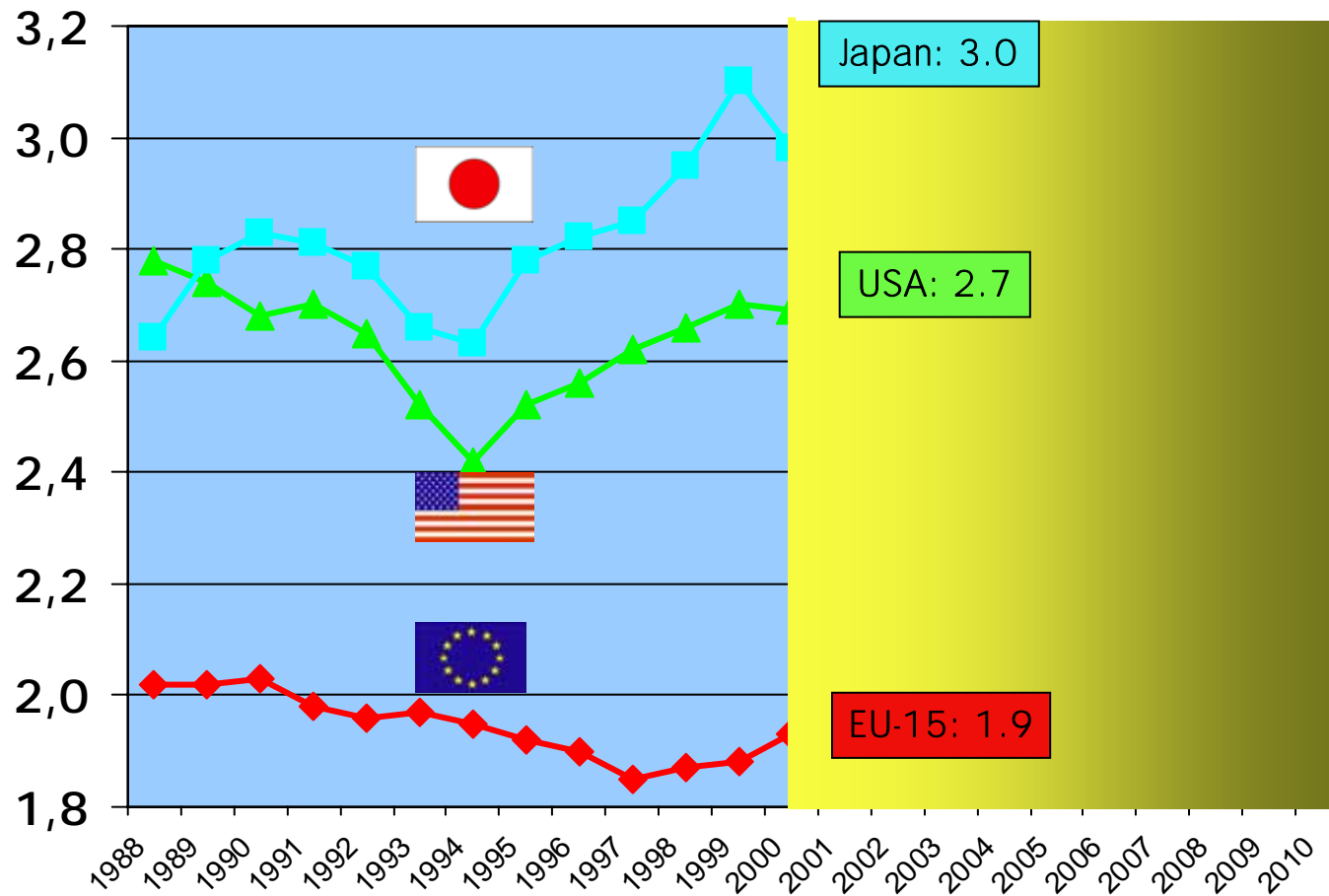


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# Research: filling the gap

Total expenditure on R&D, % of GDP  
Barcelona Summit, 2001



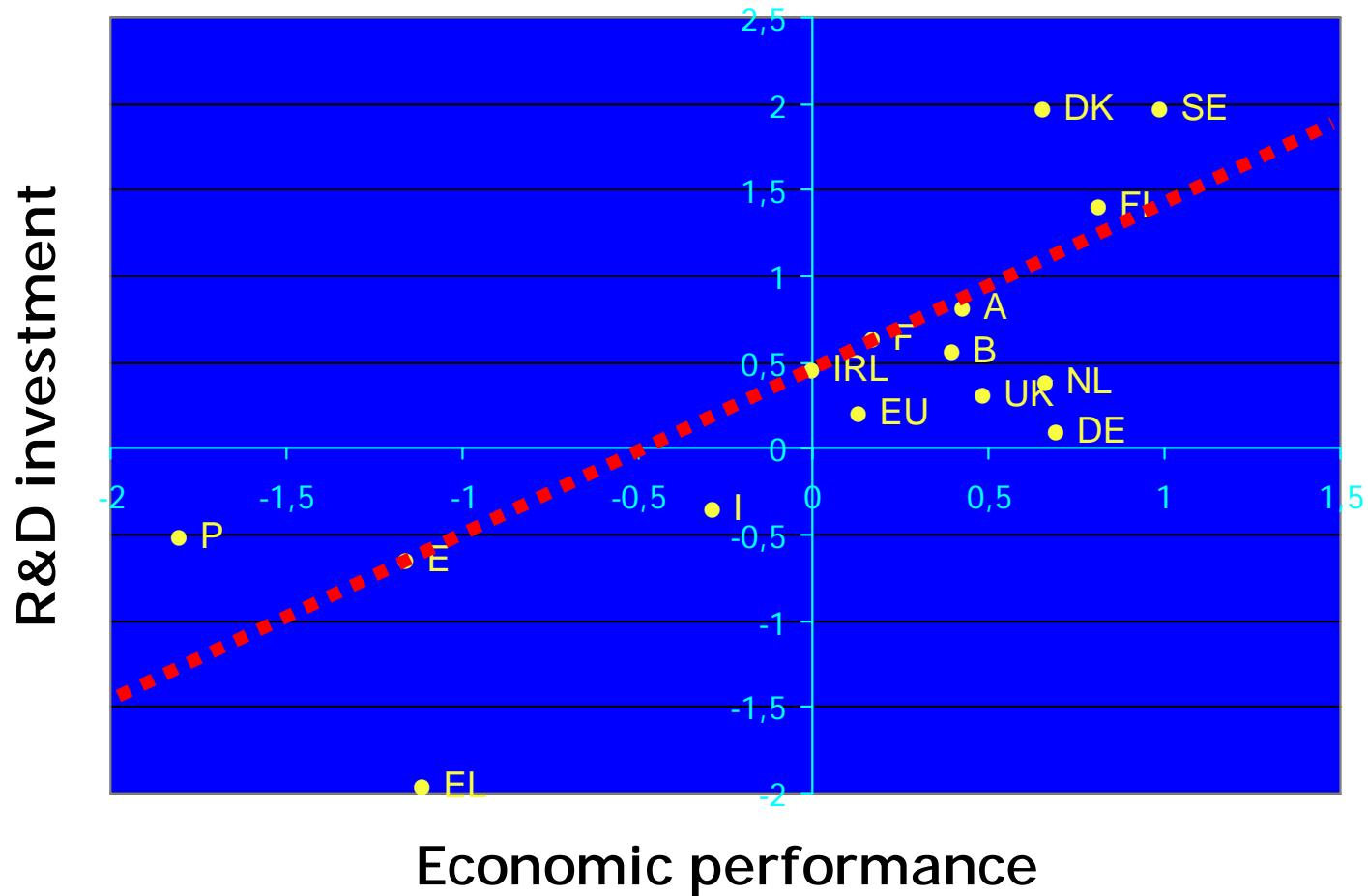
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# Research and economic development





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## R&D – European weaknesses

	EU-25	US	Japan
R&D intensity (% of GDP) <sup>(3)</sup>	1.97	2.59	3.12
Share of R&D financed by industry (%) <sup>(2)</sup>	55.9	63.1	73.9
Researchers per thousand labour force (FTE) <sup>(3)</sup>	5.5	9.0	9.7
Share of world scientific publications (%) <sup>(3)</sup>	38.3	31.1	9.6
Scientific publications per million population <sup>(3)</sup>	639	809	569
Share of world triadic patents (%) <sup>(1)</sup>	31.5	34.3	26.9
Triadic patents per million population <sup>(1)</sup>	30.5	53.1	92.6
High-tech exports as a share of total manufacturing exports (%) <sup>(3)</sup>	19.7	28.5	26.5
Share of world high-tech exports (%) <sup>(2)</sup>	16.7	20.0	10.6

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Note: <sup>(1)</sup> 2000 data <sup>(2)</sup> 2002 data <sup>(3)</sup> 2003 data



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## FPs: strong impact on the integration of the ERA

- **Concentration of research efforts through larger projects with critical mass.**
  - Average number of participants per project:  
4.7 (FP2) ▶ 14 (FP6)
  - Average EU funding per project:  
€1.2 million (FP2) ▶ €4.6 million (FP6)
- **Top-level scientists:** e.g. 8 Nobel Prize winners involved in FP6 different fundamental genomics projects
- **ERA more attractive to researchers worldwide.**
  - Number of participating countries from across the world:  
30 (FP2) ▶ 140 (FP5)

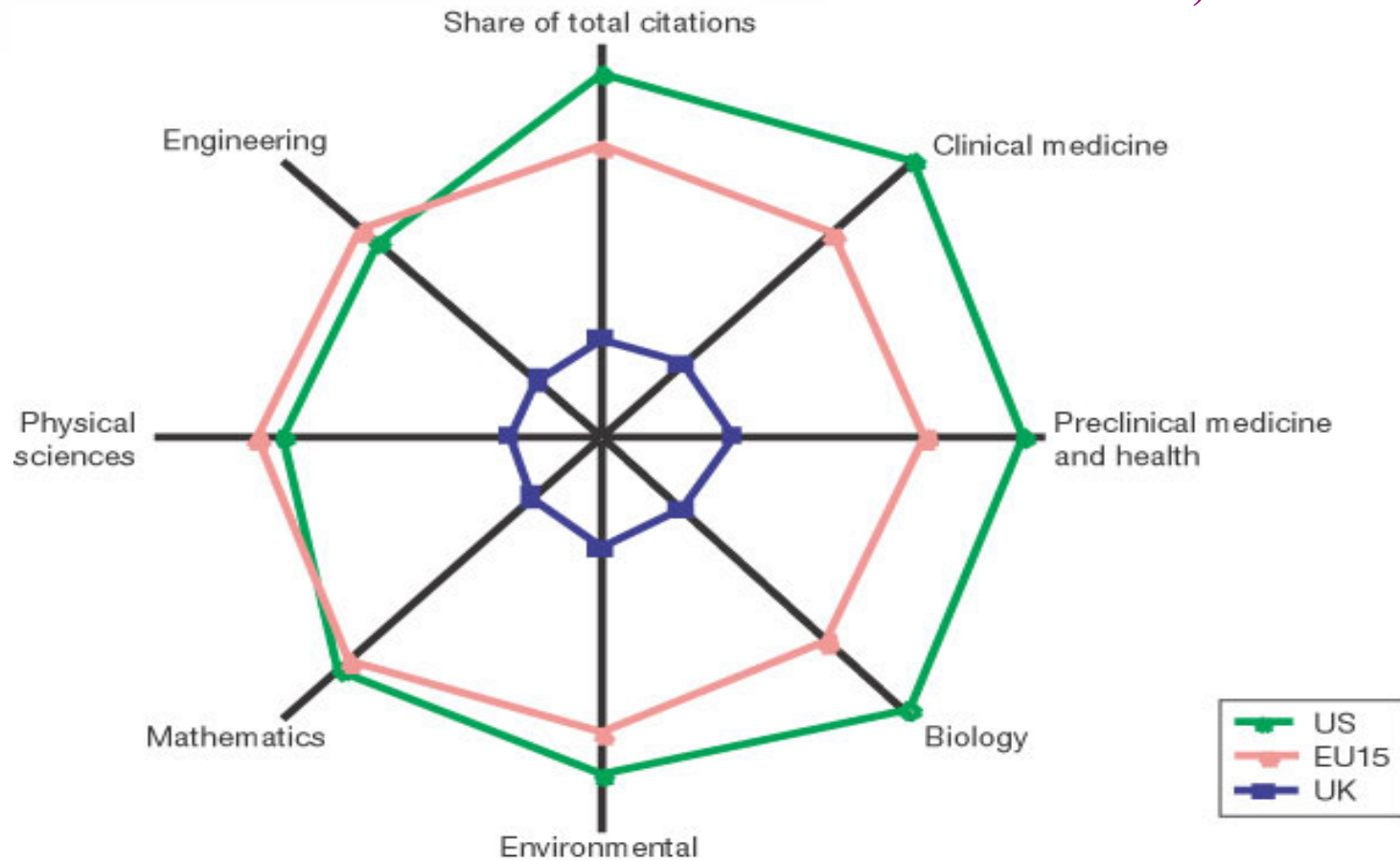


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# Comparative strengths by citations

(David King, *Nature* 15 July 2004, v430 p311-316)



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## Comparative strengths by citations (David King, *Nature* 15 July 2004, v430 p311-316)

### Total citations '97-'01:

- US 10,850,549 (49.4%)
- EU15 8,628,152 (39.3%)

### Top 1% highly cited publications '97-'01

- US 23,723 (62.8%)
- EU15 14,099 (37.3%)

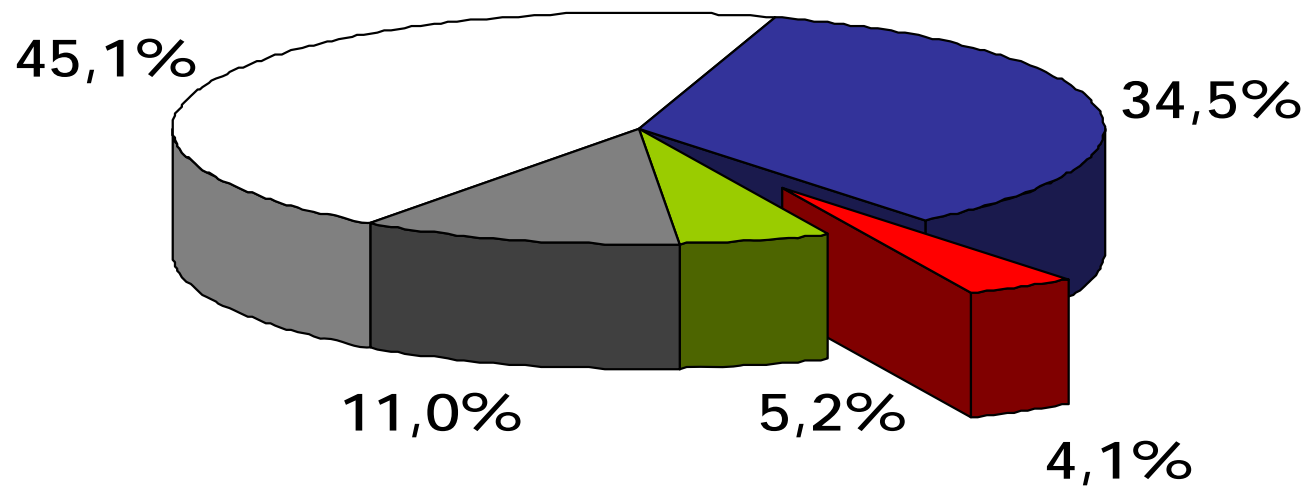
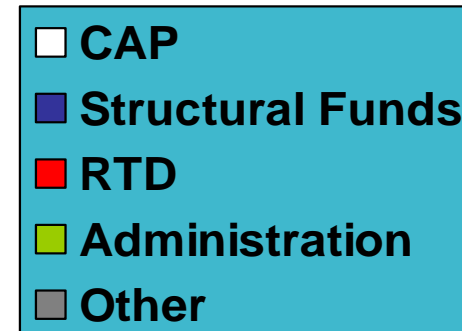


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# The EU's Budget

2002 (FP6)  
But no major  
changes for FP7





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# FP6 - Thematic Priority 1 Life Science, Genomics and Biotechnology for Health

## Objectives of theme are to:

- Focus on integrating post-genomic research, into more established biomedical and biotechnological approaches

*(N.B. Only cancer & poverty-related diseases open to wider applications)*

- Integrate research capacities across Europe
- Promote multidisciplinary research
- Emphasis on a translational approach
- Engage all the stakeholders needed

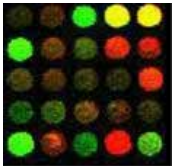


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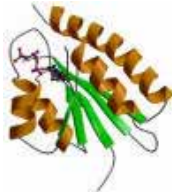
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## FP6 - Thematic Priority 1

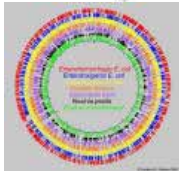
**Fundamental knowledge and basic tools  
for functional genomics in all organisms**



**Gene expression and proteomics**



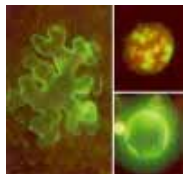
**Structural genomics**



**Comparative genomics and population genetics**



**Bioinformatics**



**Multidisciplinary functional genomics  
approaches to basic biological processes**



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## FP6 - Thematic Priority 1

### Application of knowledge and technologies in the field of genomics and biotechnology for health



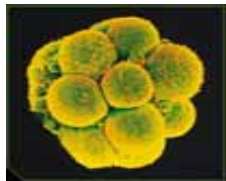
**Rational and accelerated development of new drugs including pharmacogenomics approaches**



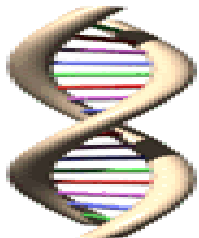
**Development of new diagnostics**



**Development of new in-vitro tests to replace animal experimentation**



**Development and testing of new preventive and therapeutic tools, such as somatic gene and cell therapies and immunotherapies**



**Innovative research in post-genomics, which has high potential for application**

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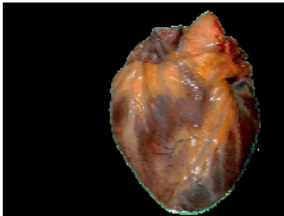


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## FP6 - Thematic Priority 1

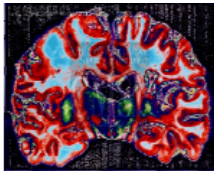
### Application oriented genomic approaches to medical knowledge and technologies



**Combating cardiovascular disease,  
diabetes and rare diseases**



**Combating resistance to antibiotics and other drugs**



**Studying the brain and combating diseases of the nervous  
system**



**Human development and ageing**

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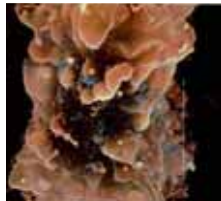
# FP6 - Thematic Priority 1

## Combating cancer



Patient-oriented strategies: from prevention to diagnosis and treatment

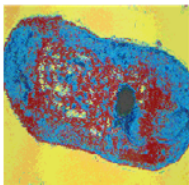
## Confronting the major communicable diseases linked to poverty



- AIDS /HIV



- Malaria



- Tuberculosis

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# Research Topics and Instruments in FP6

The research topics and the expected instruments are presented by the Work Programme

## New Instruments

- **Integrated projects, IP**
- **Networks of excellence, NoE**

## Other Instruments

- **Specific Targeted Research Projects, STREP**
- **Co-ordination Actions, CA \***
- **Specific Support Actions, SSA \***

**\* CA & SSA are not research activities**



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# SME participation in Thematic Priority 1- HEALTH

## **FP6 objective in thematic priorities:**

⇒ 15 % of the EU contribution should be given to SMEs

## **FP6 budget for TP1- Health: ~ 2450 million €**

⇒ ~ 370 million € out of the total budget for the calls should go to SMEs (excluding budgets for Article 169, etc.)

**1st call ~ 8%; 2nd call ~ 9% and 3rd call ~15%**

**→ Fourth call: thematic call + SME-STREPs call**



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# SME Call

- **Indicative budget €171 million (out of €533 million for the 4th call i.e. 32 %)**
- **SME driven**
  - Research-intensive SMEs are expected to play leading roles (although not necessarily coordinate)
  - Results should be of interest to SMEs
  - Topics identified through SME community consultation
  - Possible participation of universities, research centres, other industries and industrial associations
  - Subcontracting discouraged (not counted as SME participation)
- **30-50% of the requested contribution to SMEs**
- **Only one instrument: STREP dedicated to SMEs...**

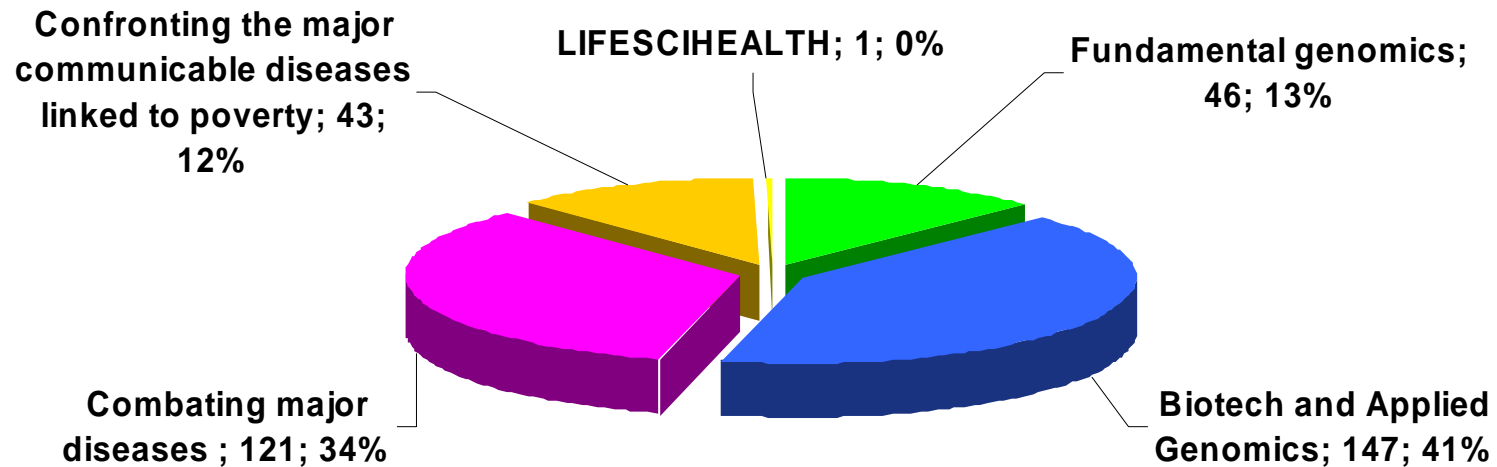


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# SME Call

## 358 total number of proposals received





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## All FP6 Health research

Themes	% of the budget dedicated to health	Figures
•Health	100%	€2450 m
•Food Agriculture and Biotechnology	50%	€370 m
•Information and Communication Technologies	10%	€400 m
•Nanosciences, Nanotechnologies, Materials and new Production Technologies	18%	€250 m
•Infrastructures	10%	€68 m

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**Total = €3,5 b (~ 0.9 b/year)**



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# The 7th Research Framework Programme 2007 – 2013

## Specific Programmes

***Cooperation* – Collaborative research**

***Ideas* – Frontier Research**

***People* – Human Potential**

***Capacities* – Research Capacity**

**+**

**JRC (non-nuclear)**

**JRC (nuclear)**

**Euratom**



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# The 7th Research Framework Programme 2007 – 2013

## ***Cooperation*** – Collaborative research

**9 themes** (*themes with health research*)

- 1. Health**
- 2. Food, Agriculture and Biotechnology**
- 3. Information and Communication Technologies**
- 4. Nanosciences, Nanotechnologies, Materials and new Production Technologies**
- 5. Energy**
- 6. Environment** (including Climate Change)
- 7. Transport** (including Aeronautics)
- 8. Socio-Economic Sciences and the Humanities**
- 9. Security and Space**

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# ***Cooperation – Collaborative research***

Support will be implemented across all themes through:

## **Collaborative research**

**(Collaborative projects; Networks of Excellence; Coordination/support actions)**

## **Joint Technology Initiatives**

**Coordination of non-Community research programmes  
(ERA-NET; ERA-NET+; Article 169)**

## **International Cooperation**

- Under each theme there will be sufficient flexibility to address both *Emerging needs* and *Unforeseen policy needs*
- Dissemination of knowledge and transfer of results will be supported in all thematic areas

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# ***HEALTH COLLABORATIVE RESEARCH***

## **Objective:**

- Improving the health of European citizens
- Increasing the competitiveness of European health-related industries and businesses
- Addressing global health issues including emerging epidemics



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# HEALTH COLLABORATIVE RESEARCH

## Rationale for pan-European approaches (I):

- Sequencing of human genome and recent advances in post-genomics  $\Rightarrow$  vast amounts of data
- Translational research (*translation of basic discoveries in clinical applications*)  $\Rightarrow$  multidisciplinary
- Clinical research  $\Rightarrow$  international multi-centre trials
- Health policy-driven research  $\Rightarrow$  comparisons of the national models & data



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# **HEALTH COLLABORATIVE RESEARCH**

## **Rationale for pan-European approaches (II):**

- **Strong EU-based biomedical and research**
  - to strengthen the competitiveness of large industries (pharma) as well as SMEs (healthcare biotech & medical technology).
  - Trans-national cooperation is essential to face worldwide competition.
  - contribute to the development of new norms & standards to establish legislative framework for new medical technologies (e.g. in regenerative medicine), which is essential for industry.



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# ***HEALTH COLLABORATIVE RESEARCH***

## **Activities ⇒ 3 Pillars**

- Biotechnology, generic tools and technologies for human health
- Translating research for human health
- Optimising the delivery of health care to European citizens



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# HEALTH COLLABORATIVE RESEARCH

**First Pillar** ⇒ **Biotechnology, generic tools and technologies for human health (I)**

- **High-throughput research:** to develop new research tools for modern biology ⇒ to enhance data generation & improve data & specimen (biobanks) standardisation, acquisition & analysis (i.e. new technologies for genotyping, structural genomics, bioinformatics & system biology, etc.)
- **Detection, diagnosis and monitoring:** to develop visualisation, imaging, detection & analytical tools & technologies for biomedical research, for prediction, diagnosis, monitoring & prognosis of diseases, & for the support & guidance of therapeutic interventions. Emphasis on no- or minimally-invasive & quantitative methods & quality assurance aspects.



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## **HEALTH COLLABORATIVE RESEARCH**

**First Pillar** ⇒ **Biotechnology, generic tools and technologies for human health (II)**

- **Innovative therapeutic approaches and interventions:** to consolidate & ensure further developments in advanced therapies & technologies with broad potential **application** (gene & cell therapy, regenerative medicine, transplantation, immunotherapy & vaccines and other)
- **Predicting suitability, safety and efficacy of therapies:** to develop & validate the parameters, tools, methods & standards needed for bringing to the patient **safe & effective new biomedicines** [i.e. in silico, in vitro (incl. alternatives to animal testing), & in vivo]



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# HEALTH COLLABORATIVE RESEARCH

## 2nd Pillar $\Rightarrow$ Translating research for human health (I)

- **Integrating biological data and processes:**
  - large-scale data gathering: to use high-throughput technologies for genomics, proteomics, population genetics, comparative & functional genomics
  - systems biology  $\Rightarrow$  to understand & model biological processes
- **Research on the brain and related diseases, human development and ageing**
  - Brain & brain-related diseases: to better understand the integrated structure & dynamics of the brain, & to study brain diseases/disorders & search for new therapies.
  - Human development & ageing: to better understand the process of life-long development & healthy ageing.



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# HEALTH COLLABORATIVE RESEARCH

2nd Pillar ⇒ Translating research for  
human health (II)

- **Translational research in major infectious diseases:**
  - **Anti-microbial drug resistance:** to combine basic research with clinical research towards new interventions.
  - **HIV/AIDS, malaria & tuberculosis** ⇒ emphasis on preclinical & early clinical research
  - **Emerging epidemics:** to confront emerging pathogens with pandemic potential including zoonoses (e.g. SARS & highly pathogenic influenza)
- **Translational research in other major diseases:**
  - Cancer
  - cardiovascular disease
  - diabetes & obesity
  - rare diseases
  - **other chronic diseases:** focus on non-lethal diseases with a high impact on the quality of life at old age (e.g. rheumatoid diseases)



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# **HEALTH COLLABORATIVE RESEARCH**

## **3rd pillar: Optimising the delivery of health care to European citizens (I)**

- **Enhanced health promotion and disease prevention:** ⇒ to provide evidence for the best public health measures in terms of life styles and interventions - different levels & different contexts (mental health will be addressed)
- **Translating clinical research outcome into clinical practice:** Better use of medicines, appropriate use of behavioural and organisational interventions, health therapies & technologies. Special attention paid to patient safety. (e.g. benchmarking of strategies; investigating outcomes of different interventions including medicines)



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# **HEALTH COLLABORATIVE RESEARCH**

## **3rd pillar: Optimising the delivery of health care to European citizens (II)**

- **Quality, solidarity and sustainability of health systems.** Basis for countries to adapt their health systems taking into account national contexts and population characteristics.
  - Organizational, financial and regulatory aspects
  - Implementation - best practice
  - Outcomes - effectiveness, efficiency and equity
  - Special attention on investment issues and human resources



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## ***HEALTH COLLABORATIVE RESEARCH***

Two other strategic issues that will be addressed across activities:

- Child health
- The health of the ageing population



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## ***HEALTH COLLABORATIVE RESEARCH***

### **From FP6 to FP7:**

- Continuity in the research activities
- Focus on genomics has disappeared
- Emphasis put on translational research
- Biomedical technology & engineering (rich in SMEs) is re-introduced
- health policy-driven research (public health) is strongly reinforced



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# Joint Technology Initiative

⇒ Innovative Medicines

## Long term objective:

To increase the competitiveness of the European Pharmaceutical industry, and to foster Europe as the most attractive place for pharmaceutical R&D.

Thereby enhancing access of innovative medicines to the benefit of patients and society.

## Aim:

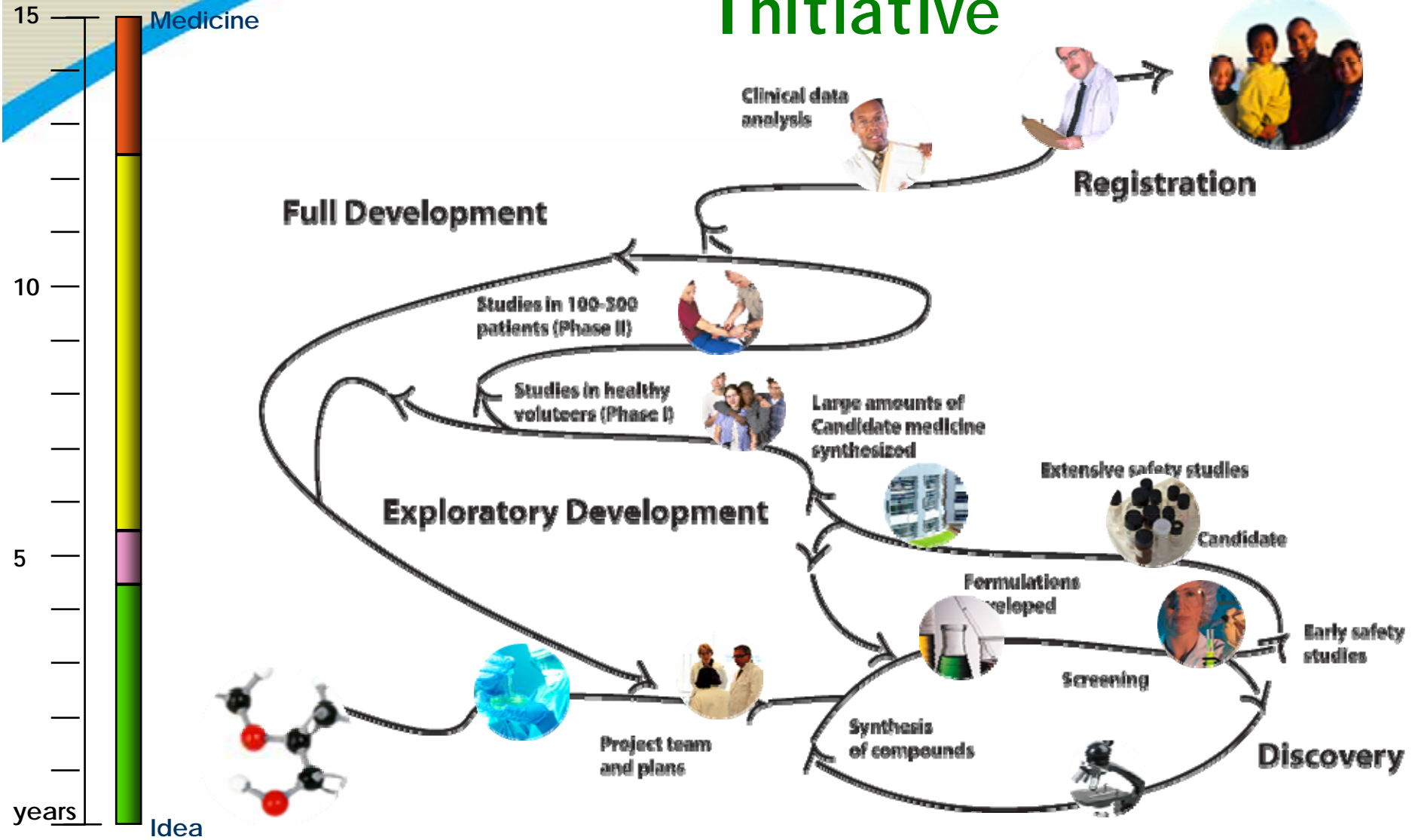
To remove major bottlenecks in the drug development process, as identified by industry, and where research is the key.



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# Innovative Medicines Initiative



Creating new medicines is a high risk journey

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# Innovative Medicines Initiative

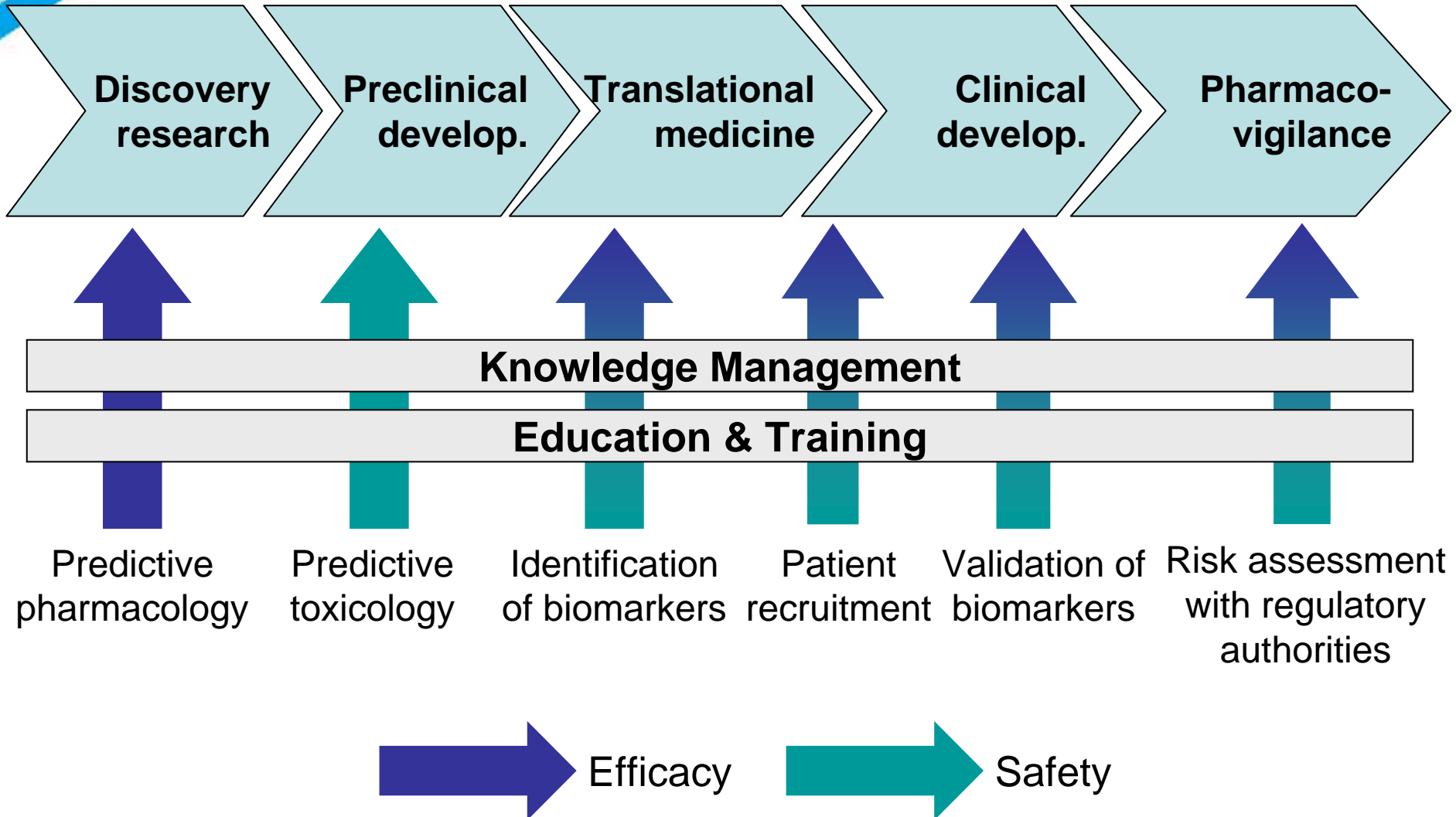
- **Industry** (under the leadership of EFPIA) has identified the bottlenecks in agreement with key stakeholders: academia, regulatory agencies, patient organisations, clinical researchers, ethical experts, etc.
- **A *Strategic Research Agenda*** prioritising the research needs and how they should be implemented has been developed by panels of experts.



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# IMI addresses the bottlenecks in R&D



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# Innovative Medicines Initiative

The Strategic Research Agenda will address bottlenecks in four main areas:

- Improved prediction – early indications of safety.
- Improved clinical performance – early indications of efficacy by use of biomarkers.
- Better knowledge management through collaboration – breaking information barriers at the interfaces.
- Bridging educational gaps – pre-clinical and clinical research and breaking barriers between disciplines.

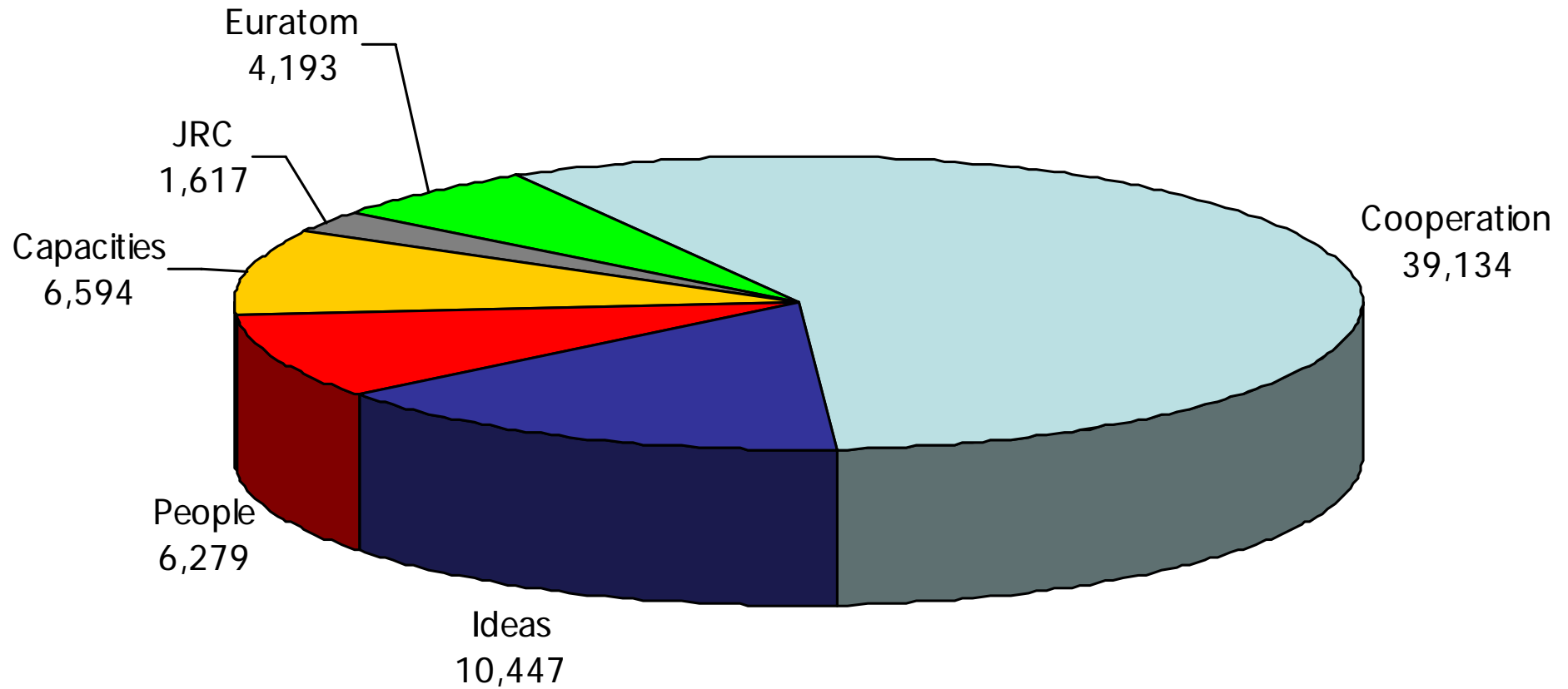


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# FP7 budget

(EUR billion, 2004 constant prices)



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## *Financial perspectives agreement in dec. 2005*

**Total FP7 budget  $\approx$  €47 billion**

(2004 prices)

**Instead of the  $\approx$  €64 billion requested**

(2004 prices)

***$\Rightarrow$  More than 30 % reduction and  
more priorities than in FP6 (ERC, JTI, etc.)***



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# FP7 Timetable

<b>6 April 2005</b>	<b>Commission's proposal</b>
<b>September 2005</b>	<b>Specific programmes' proposal</b>
<b>December 2005 ?</b> <i>postponed</i>	<b>First reading at EP</b>
<b>January 2006 ?</b> <i>postponed</i>	<b>Common position at Council</b>
<b>March 2006 ?</b> <i>postponed</i>	<b>Second reading and approval at EP</b>
<b>June 2006 ?</b> <i>postponed</i> <i>to October</i>	<b>Adoption</b>
<b>November 2006 ?</b>	<b>Launch Conference / 1<sup>st</sup> calls for proposals</b>

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# Information

- EU research: <http://europa.eu.int/comm/research>
- Seventh Framework Programme:  
[http://europa.eu.int/comm/research/future/index\\_en.cfm](http://europa.eu.int/comm/research/future/index_en.cfm)
- Basic research website:  
[http://europa.eu.int/comm/research/future/basic\\_research/index\\_en.html](http://europa.eu.int/comm/research/future/basic_research/index_en.html)
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<http://www.cordis.lu>
- RTD info magazine:  
<http://europa.eu.int/comm/research/rtdinfo/>
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[research@cec.eu.int](mailto:research@cec.eu.int)

