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# The changing face of R&D: Are the traditional phases redundant and are the “learn and confirm” paradigms more relevant to today’s environment?

## European Viewpoint

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Answers That Matter.

# What are we trying to solve?



- Increasing cost of innovation
  - greater emphasis on real improvement over existing drugs
  - greater emphasis on safety
  - failure to tackle attrition along the value chain
- Downward pressure on prices
- Pressure to tackle major societal issues
  - environment
  - bioterrorism
  - antibiotic resistance
  - neglected diseases (rare or third world)
- Industry reputation


# What are the opportunities?



- Wealth of novel opportunities from genomics
  - The right molecules for the right targets and bring them to the right patients
- The potential of increased cooperation with stakeholders
  - Greater academic collaboration, increased patient involvement and better dialogue with regulators
- The advantages of increased openness
  - Transparency of operation e.g. publication of Clinical Trial data, sharing toxicology data, etc.

# Global recognition of the problem



	Innovative Medicines Initiative (EU)
	Medicamentos Innovadores (Spain)
	Top Institute Pharma (Netherlands)
	ECRIN (France)
	Safety Biomarkers (UK)
	FDA Critical Path Initiative (NIH)
	Safe and Innovative Medicines (PhRMA)
	Biomarker Initiative (PhRMA)
	Critical Path Institute (University of Arizona)
	Center for Biomedical Innovation (MIT)
	Toxicogenomics Project (JPMA)
	Proteome Factory Consortium (JPMA)
	Large-scale Clinical Trial Network

# The European dilemma



- Not a single country
  - diverse regulatory procedures, fragmented markets, competing interests
- Ageing population
- High wage economies
- High expectations of state provision of healthcare and support

*...The current trends lead us to a position outside the world's top economic powers by 2030*

*...Europe and its citizens should realise that their way of life is under threat but also that the path to prosperity through research and innovation is open if large scale action is taken now by their leaders before it is too late*

*Aho Report*

# The Innovative Medicines Initiative

## *What is it?*



- Clear, practical paths to accelerate the discovery and development of more effective innovative medicines with fewer side-effects.
- Innovative projects that address the causes of delay or bottlenecks in the R&D process.
- Unique pan-European public and private sector collaboration in biopharmaceutical research.
- First pre-competitive collaboration of this amplitude: €460 million per annum over 7 years (50% EU; 50% Industry)

# The Innovative Medicines Initiative *History and Future*

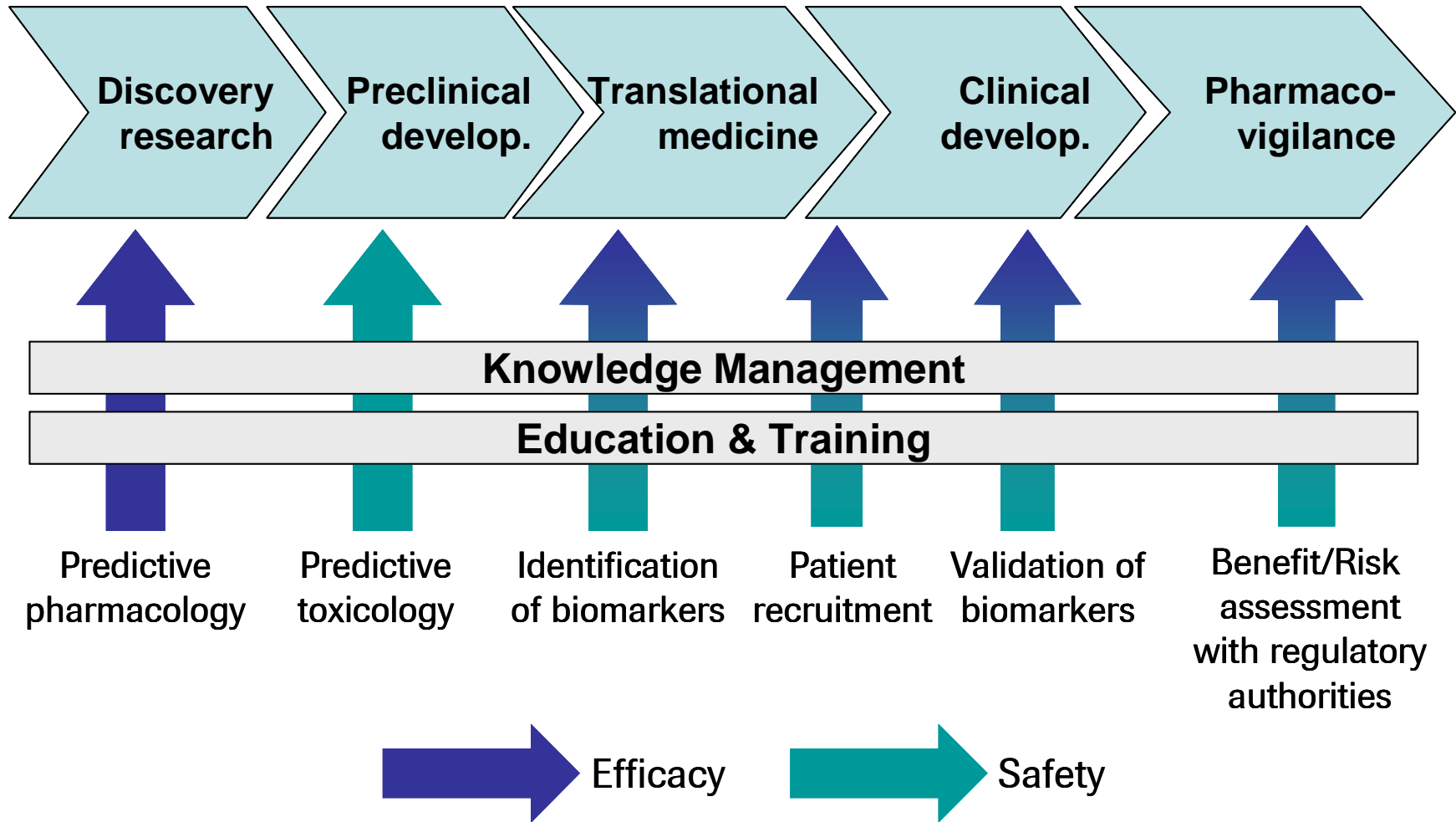


- Joint initiative between EFPIA and European Commission in 2004 – consultation with stakeholders throughout 04/05.
- Pilot proposal generated and now funded under Framework Programme 6: InnoMed
- Strategic Research Agenda: [www.imi-europe.org](http://www.imi-europe.org)
- IMI to be proposed as a Joint Technology Initiative under Framework Programme 7
- 2 billion euros over 7 years, shared equally between EFPIA members and the EC



# The Innovative Medicines Initiative

Strategic Research Agenda focus on the “pre-competitive”  
bottlenecks in the R&D Process



# SAFETY: Making Medicines Safer



- Main recommendations:
  - Create a European Centre for Drug Safety Research
  - Establish a framework for biomarker development to study human relevance and regulatory utility
  - Develop computational methods for predicting toxicity
  - Pharmacovigilance: Develop novel methods of risk prediction and benefit-risk assessment
- Outcomes:
  - Reduced late stage failure
  - Better post-marketing risk-benefit analysis
  - Higher rate of approval based on improved risk management
  - Reduced burden of mandatory post-approval trials
  - Faster delivery to patients but with reduced risk

# EFFICACY: Making Medicines More Effective



- Main recommendations:
  - Focus on areas of high scientific challenge
    - cancer, inflammatory disease, brain disorders, metabolic disease, infectious disease
  - Stimulate translational medicine
  - Create disease-specific imaging networks
  - Develop partnership with regulators for innovative clinical trial design and acceptance of biomarkers
- Outcomes:
  - Reduced failure rate at proof of concept and later
  - Greater efficacy of new medicines
  - Better more robust measures of efficacy addressing patient need
  - Reduced burden of clinical trials

# KNOWLEDGE MANAGEMENT and EDUCATION & TRAINING Underpinning Infrastructures

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## KM

- Main recommendations:
  - Enhanced knowledge representation models and data exchange standards for complex systems
  - Core reference database of validated experimental data extracted from the literature
  - Expert tool to allow the federation of local databases in a secured environment

## E&T

- Main recommendations:
  - Create a European Medicines Research Academy for education and training for professionals involved in biomedical R&D and regulation
  - Develop programmes for the critical areas of need
  - Foster mobility and understanding between academia and industry

# IMI structure and governance

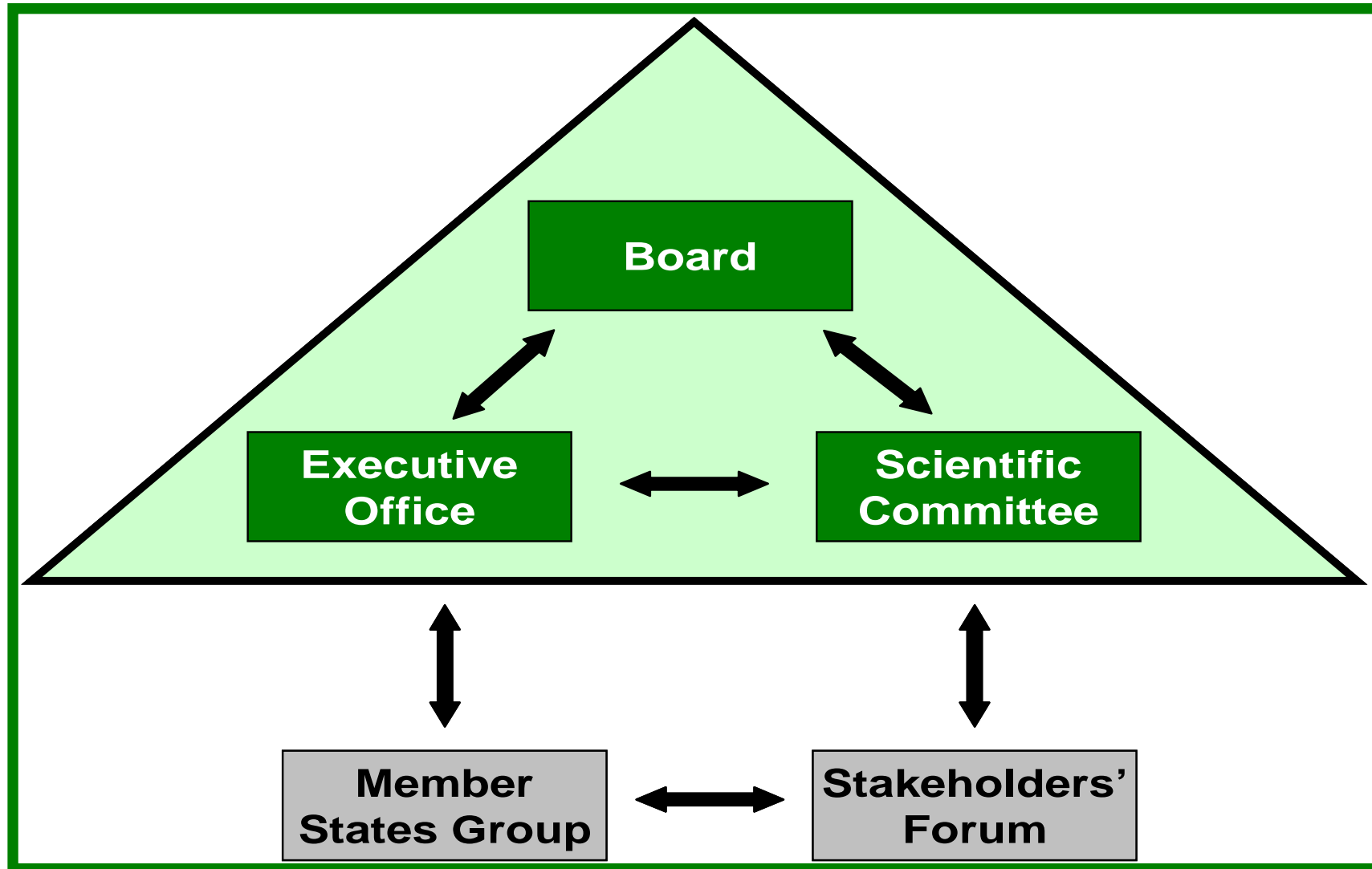
## Guiding Principles

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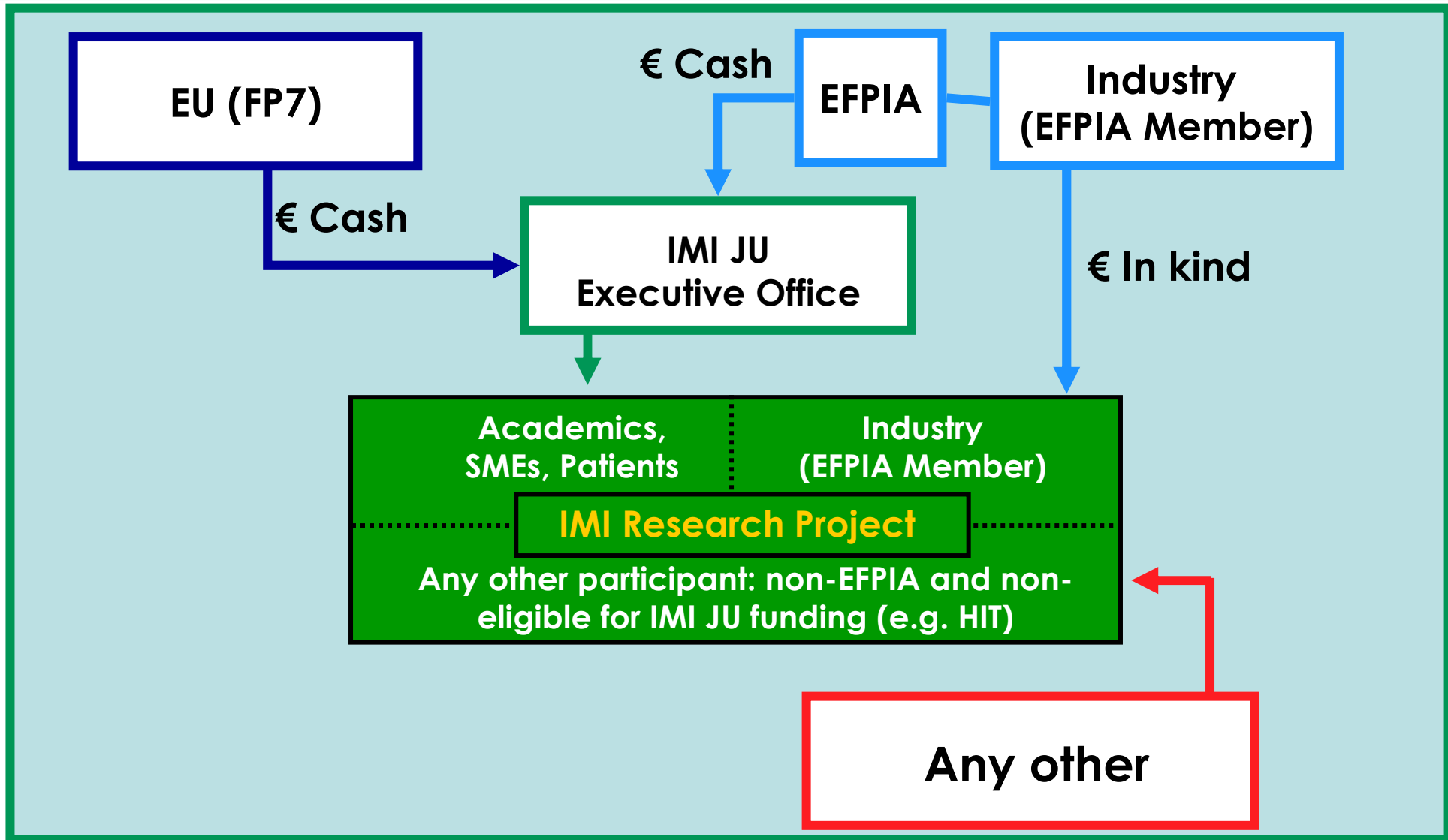


- A Joint Undertaking as defined by Article 171 of the Treaty of Rome
- IMI's governance structure reflects:
  - science
  - collaboration between stakeholders
  - rapid take up of research results
  - convergence and synergies with national and international efforts
  - transparency and openness
- IMI will be an open structure where the research will be done by industry, SMEs, academia, clinics, patient organisations, etc. following open calls and peer review.
- Rules for IPR will be fair and clear to all participants from the outset.

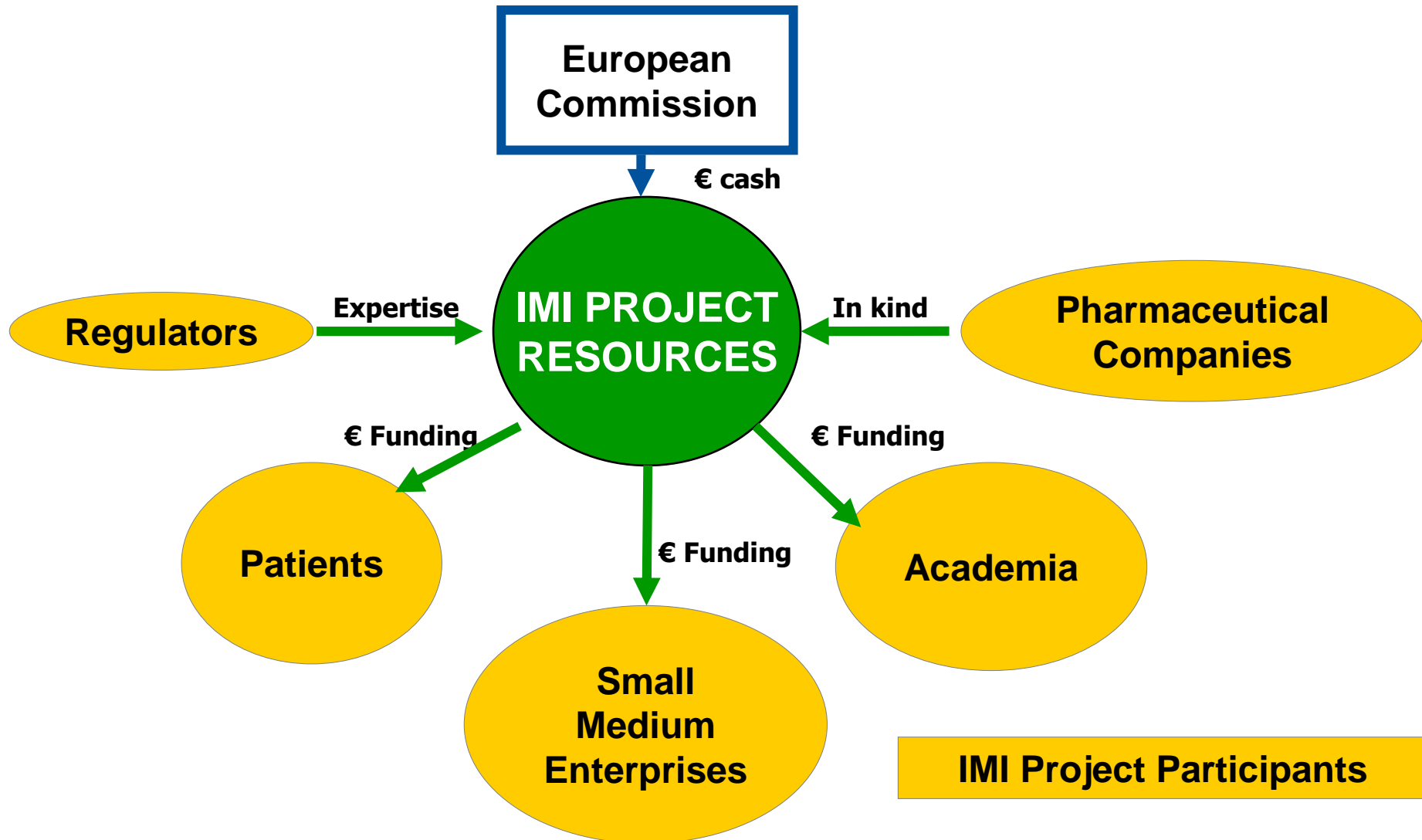
# IMI Governance Structure



# IMI Funding Flow and Contributions



# Project Participants & their Contribution



# Impacts in the R&D Process

## What could change?



### Doing what we do now but better and/or faster

- Predictive toxicology, predictive pharmacology

### Doing things differently

- Patient databases
  - Medical records, patient networks, biobanks
- Patient recruitment
  - Enriched populations, participation of patient organisations
- Clinical trial design
  - Adaptive trials, non-frequentist methods
  - Use of biomarkers and surrogates
  - Patient centred endpoints and quality of life issues
  - Demonstration of therapeutic advantage
  - Asking “why did this happen?” not “what happened?”
- Approval
  - Acceptance of biomarkers and surrogates
  - Increase in conditional marketing authorisations
  - Demonstration of value and impact on pricing

# EMA Key objectives and priorities for 2007



- Implementation of legislation on medicines for children
- Safety of medicines for human and veterinary use
  - Early assessment of safety prior to authorisation, implementation of risk-management plans, life cycle monitoring (ERMS, EudraVigilance)
- Stimulation of innovation
  - Scientific advice, support for SME's, support for EC on advanced therapies and IMI
- Earlier and improved availability of medicines
  - Conditional MA, accelerated assessment, compassionate use
- Transparency, communication and provision of information
  - Information to patients, involvement of patients in Agency work
- The European medicines network

# EMA initiatives relevant to IMI



- EMA involved throughout the consultation process and in the creation of the Strategic Research Agenda
- Increased use of the centralised procedure in major disease areas
  - Cancer, diabetes, AIDS, neurodegenerative disease, orphan drugs.....autoimmune disease, viral disease
- EMA Consultation and EMA/EFPIA Workshop on Biomarkers and Surrogates
- EMA Consultation on Innovative Drug Development Approaches for Medicinal Products for Human Use
  - Biomarkers, endpoints, CT design, pharmacovigilance, statistical and methodological issues
- CHMP Guideline on non-clinical requirements for phase 1
- New Scientific Advice process

# EMA Scientific Advice process



- Earlier and greater systematic involvement of experts
- Faster delivery of advice to sponsors
  - Comparable with FDA
- Broader scope
  - Preclinical to post authorisation and pharmacovigilance (eg follow up)
  - Prospective, strategy not data assessment
  - Product related as before but now.....
    - Broader/more general advice for specific types of products/treatments
    - Mandatory scope of centralised procedure
    - New and emerging therapies
    - Conditional marketing authorisations
  - Support for SMEs (fee reduction)
- Transparency and communication eg EMA-FDA parallel advice

# Why is IMI a good thing?



- Industry led
- Scope and duration
- Organisational structure gives flexibility and coordination
- Public money matching private resource is a great incentive to join
- Encouragement of openness
- Willingness on all sides to succeed
- Enthusiastic cooperation of regulatory authorities
- Boost to SME business development
- Long term effect on healthcare provision

## Next Steps



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|-----------------|--|
| <b>Now</b>      | European Commission and EFPIA prepare package for submission to the Member States (European Competitiveness Council) |
| <b>April</b>    | European Commission submits package to the European Competitiveness Council and the European Parliament              |
| <b>October</b>  | Opinion of European Parliament   |
| <b>November</b> | Approval by European Council   |
| <b>December</b> | IMI publishes first calls for proposals  |