EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

Innovation from a regulatory perspective

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Innovation and the Regulators

Challenges

- **New medicines**

- **Reduced number of clinical trials, new drugs, investments**

- **Reduced access to new medicines**

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  - **Advanced therapies**
  - **Precision medicines**

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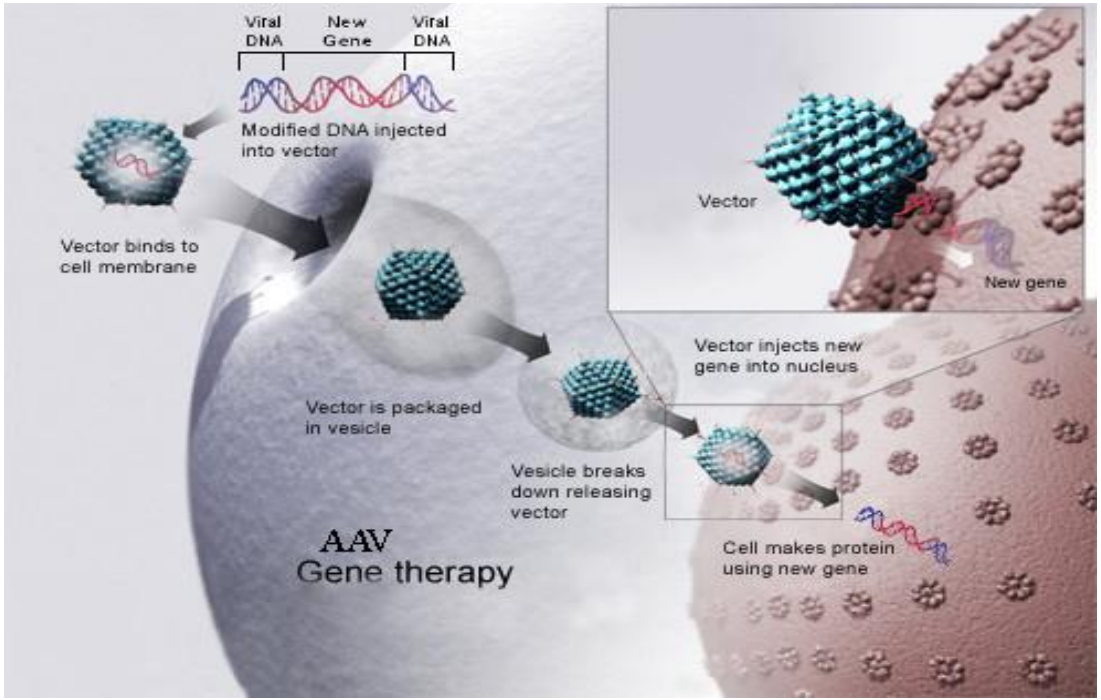
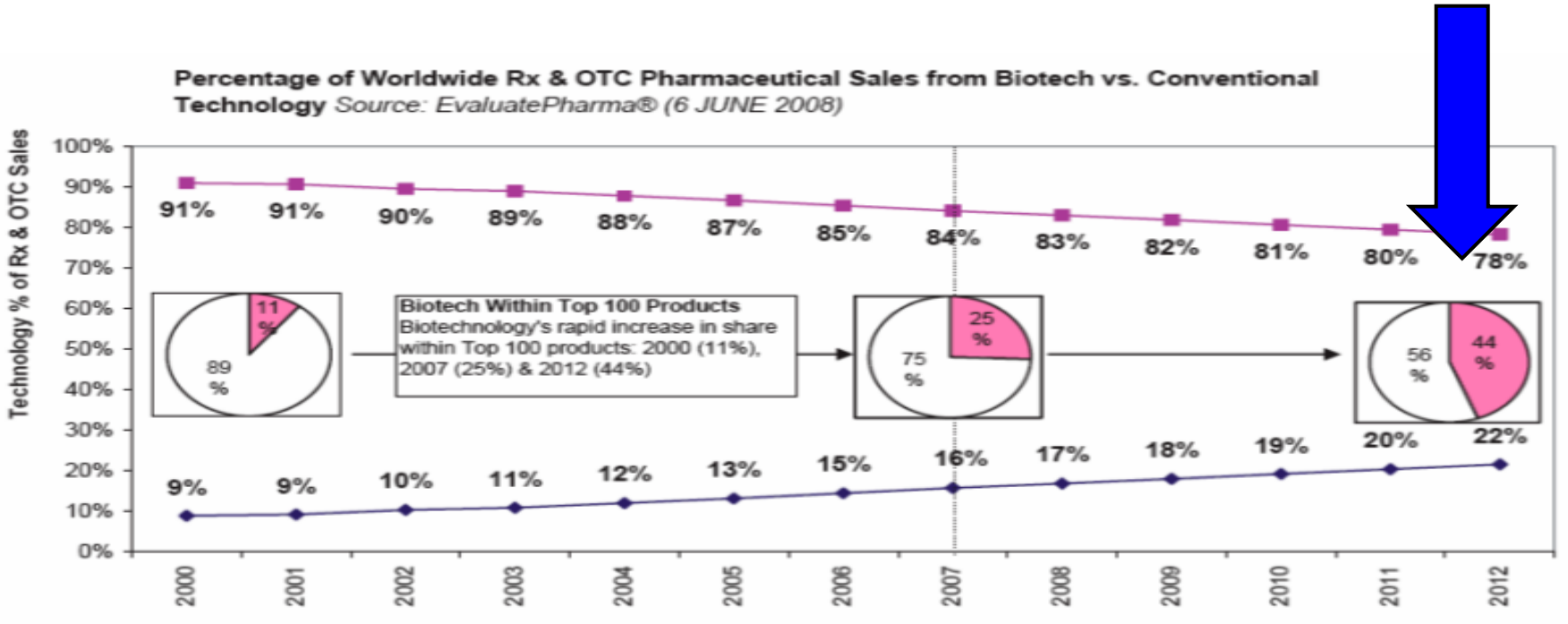
Advanced Therapies

- **Alipogene tiparvovec (Glybera), first gene-therapy medicine to be recommended for authorisation in the European Union**

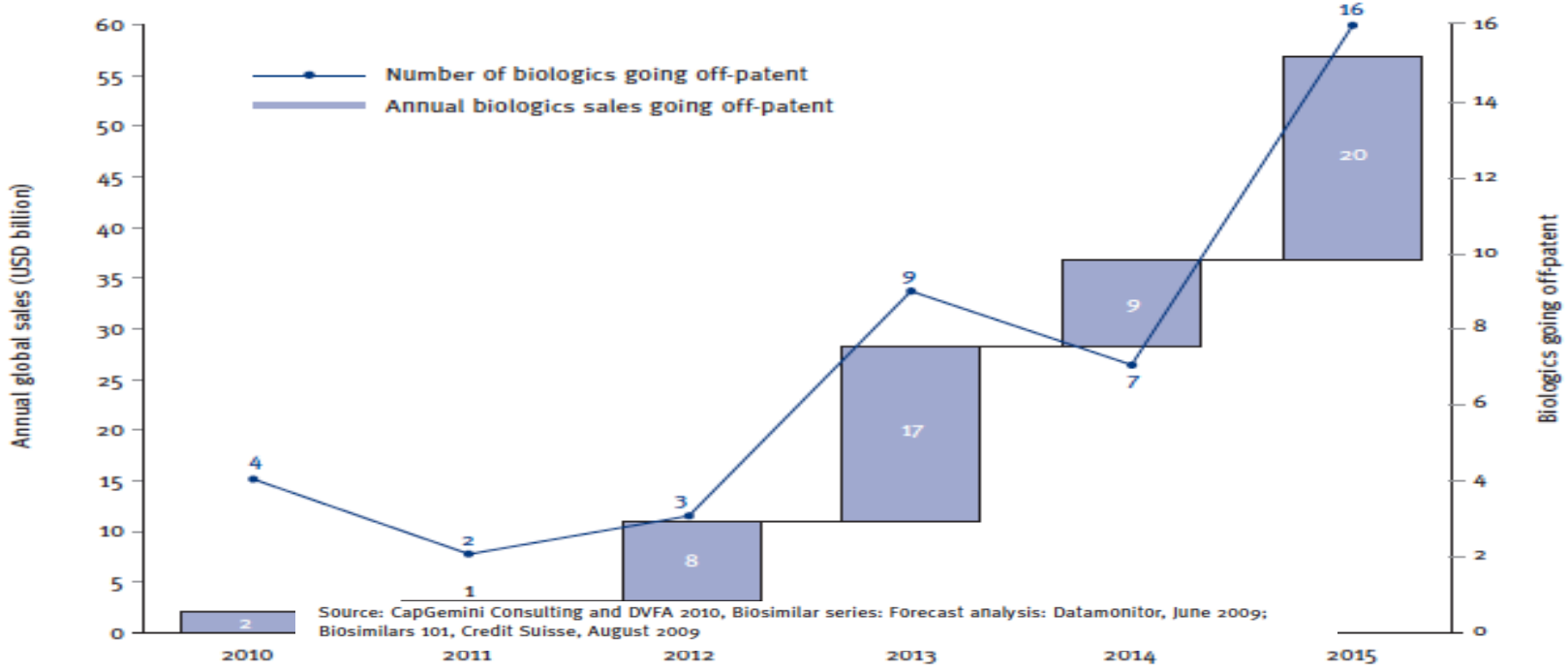
- **Treats lipoprotein lipase (LPL) deficiency in patients with severe or multiple pancreatitis attacks, despite dietary fat restrictions**



Biopharmaceuticals vs Chemicals in 2000-2012



Number and value of biologic drugs set to lose patent protection per year through 2015

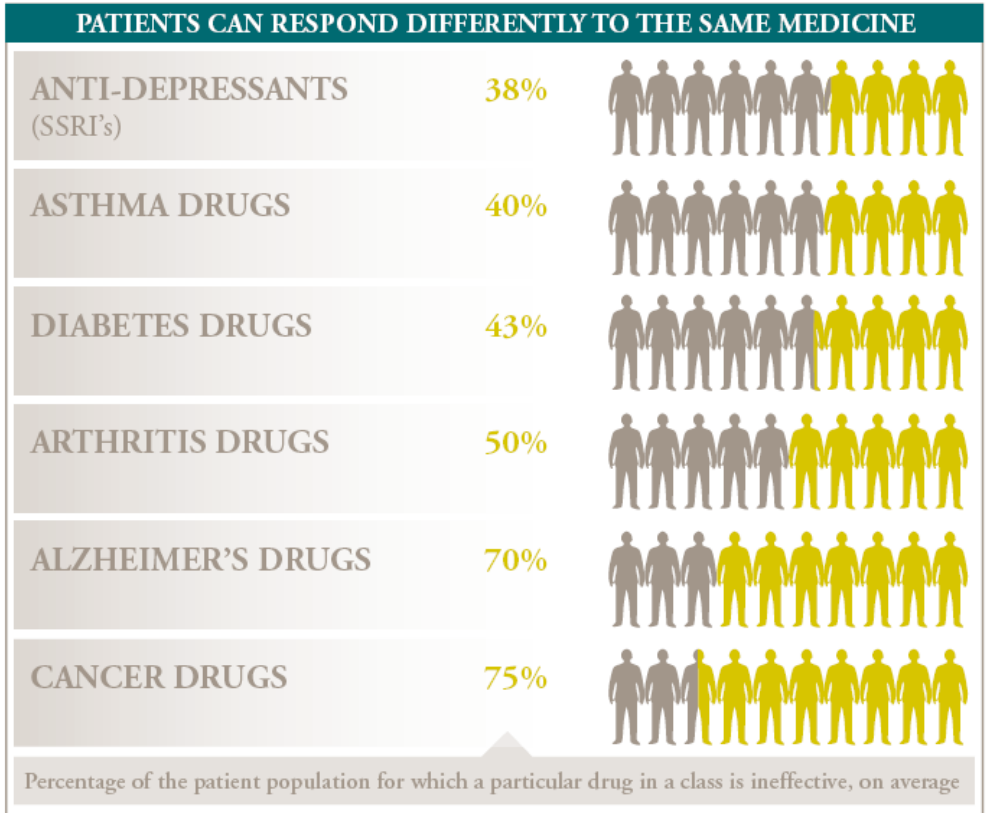


Precision Medicine

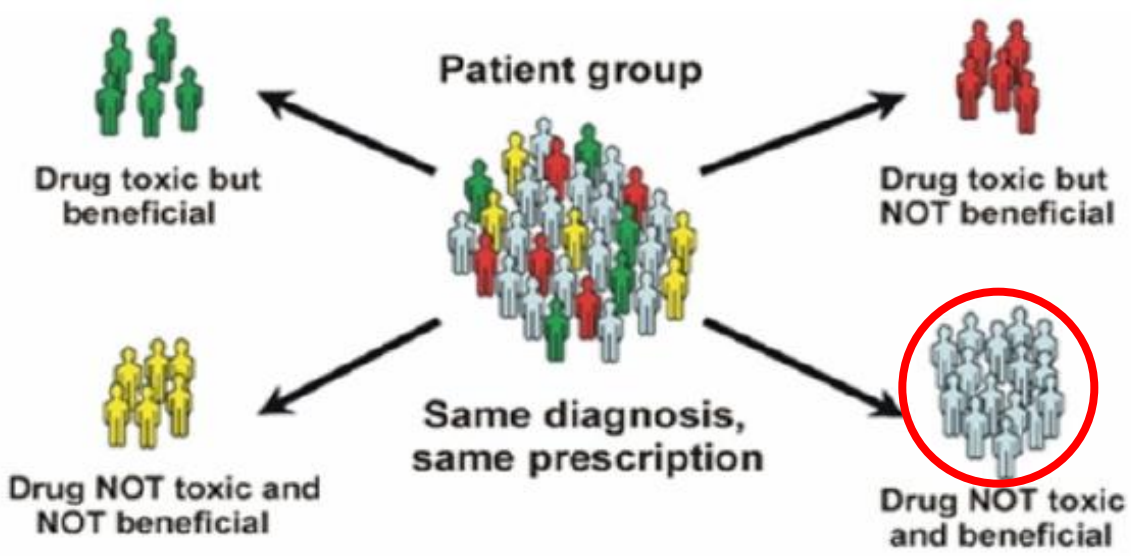
Tailored Medicine. Medicines developed for large populations (some with tests to refine / tailor use, e.g. warfarin)

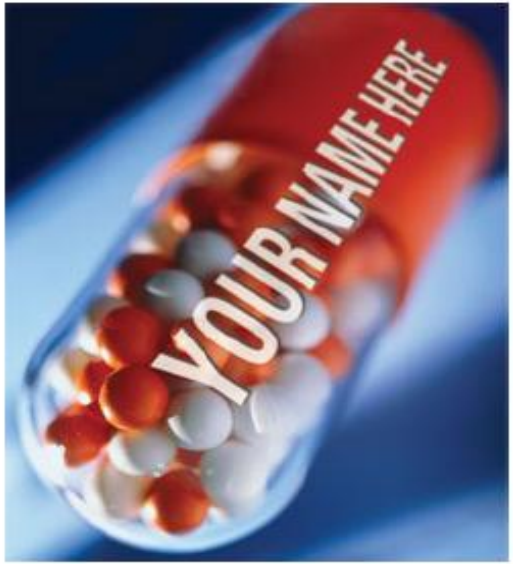
Stratified Medicine. Targeted medicines for a specific phenotype of diseases identified through validated biomarkers.

Personalised Medicine. Medicines specifically developed for use in one individual (e.g. ATMPs)



The role of Precision Medicine





Precision medicine is becoming an integral part of the R&D process making it possible to more effectively prevent, diagnose and treat diseases. Precision medicine could help to control costs by reducing unnecessary treatment and side effects.

Innovation and the Regulators

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  - **Advanced therapies**
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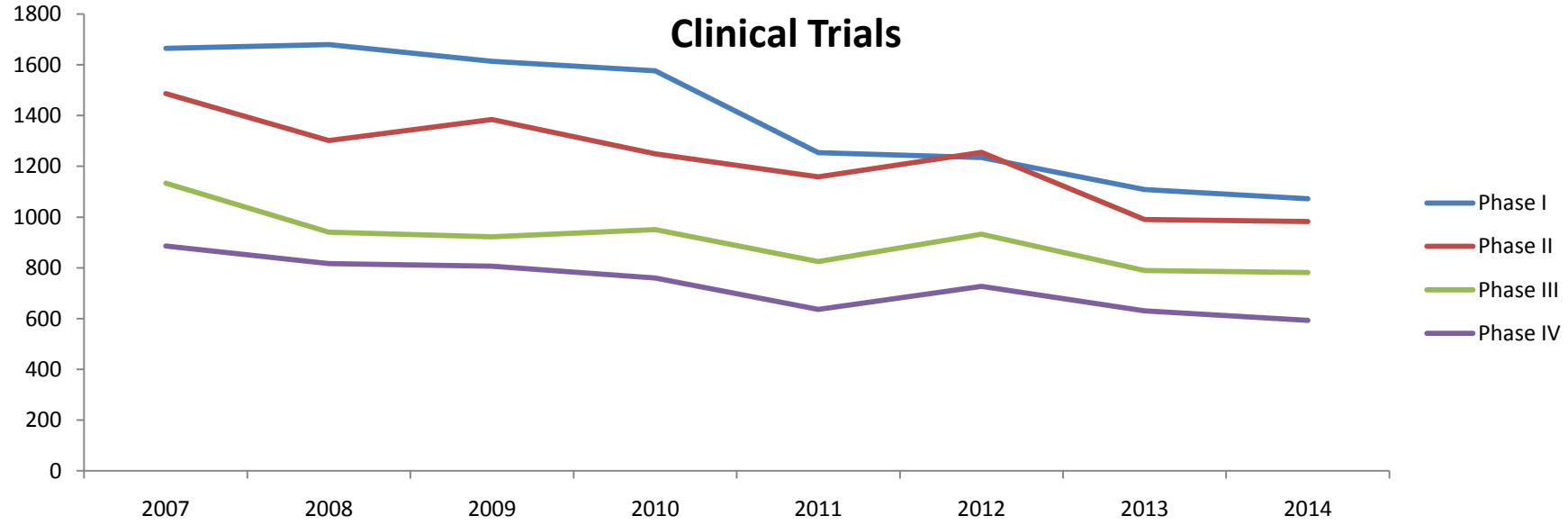
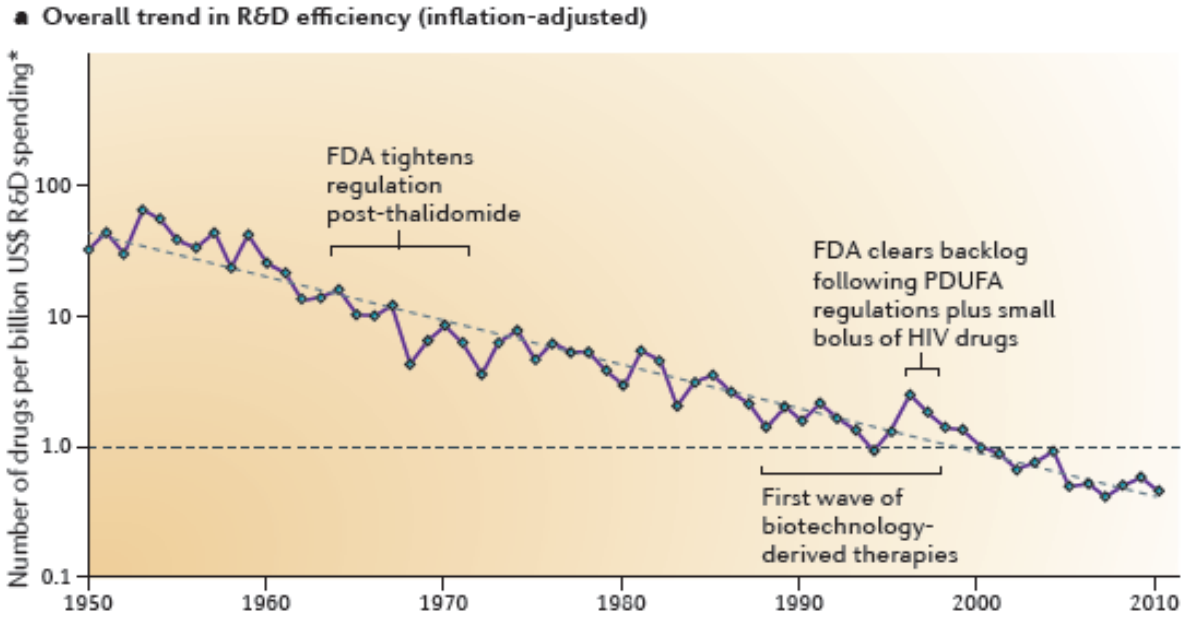
Clinical Trials in Europe



The Eroom's Paradox



Scannell J W et al. Nature Rev. 2012;11:191-200

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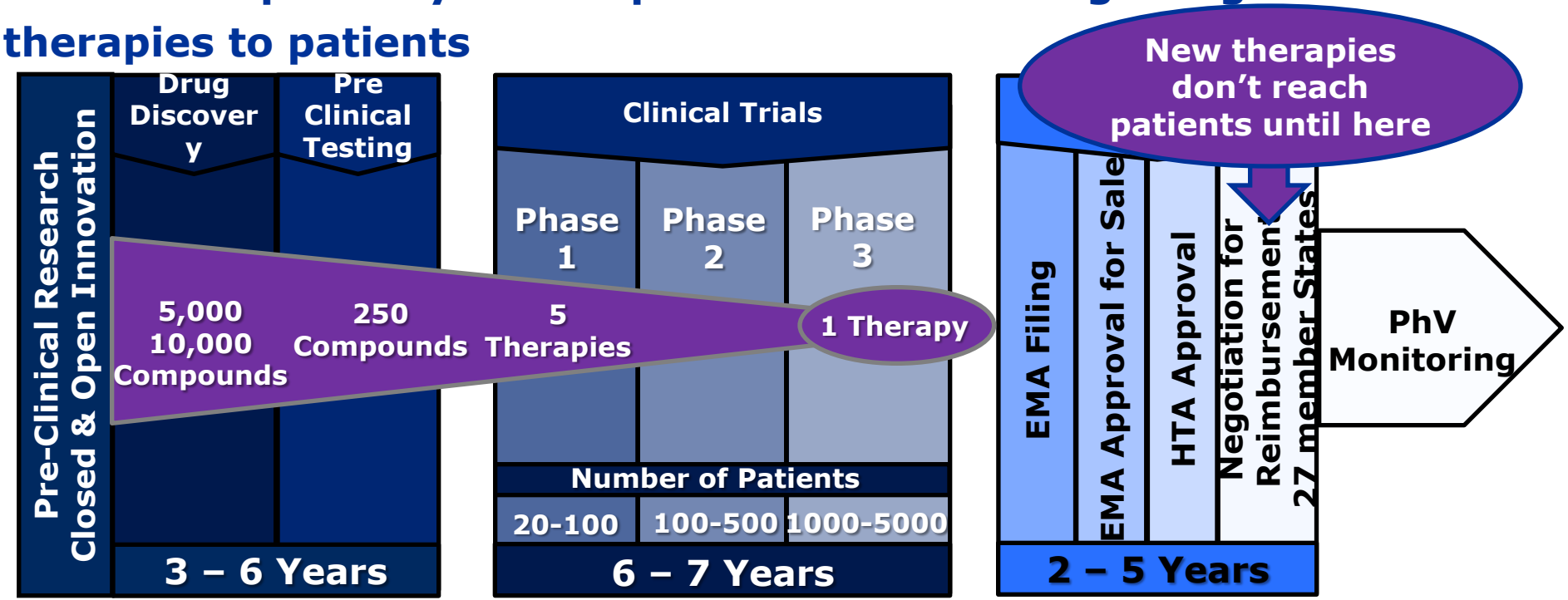
Current EU pathways are expensive and slow in getting new therapies to patients



Total Cost: → **$2 - $4 Billion USD**

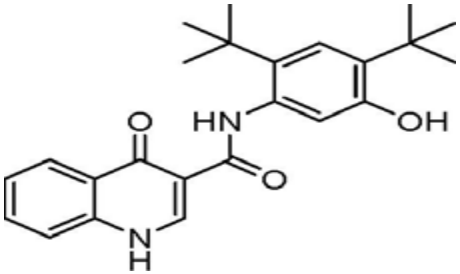
Forbes, Matthew Herper, "The Truly Staggering Cost Of Inventing New Drugs", February 10, 2012

First authorization of a CFTR modifier

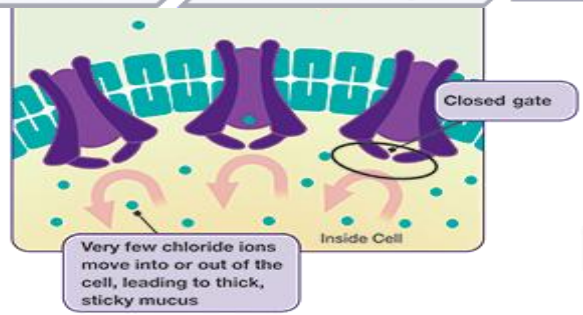
Discovery/Manufacture

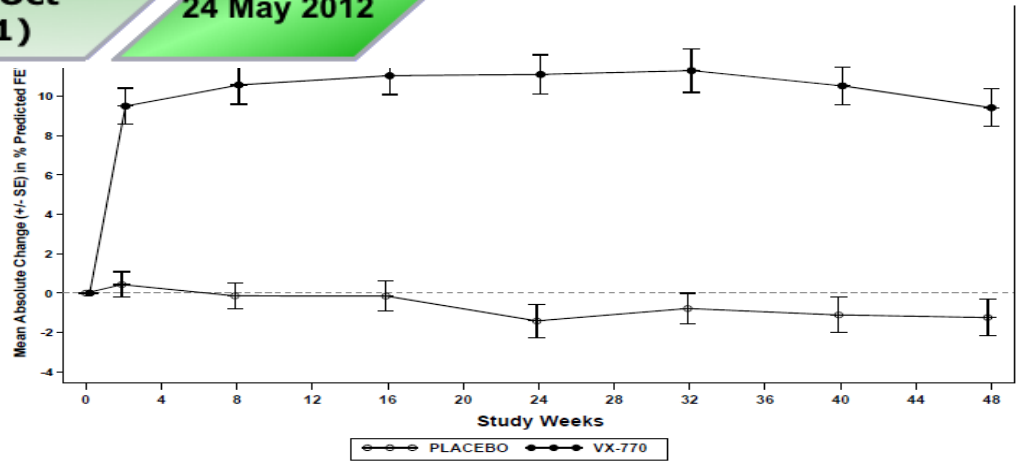
Pre-clinical development

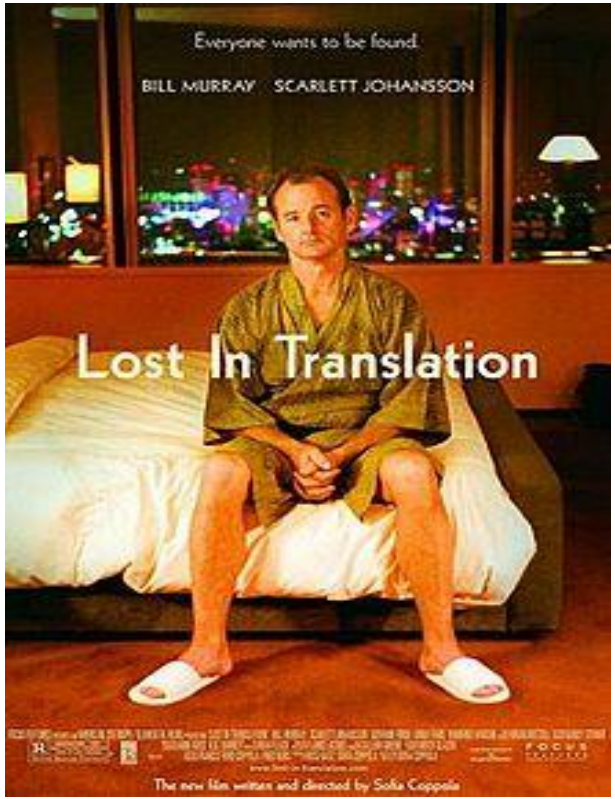
Clinical development



Orphan Drug Designation (July 2008) → Protocol assistance (Oct-Dec 2010) → MAA (27 Oct 2011) → CHMP MA 24 May 2012






Everyone wants to be found.
BILL MURRAY SCARLETT JOHANSSON
Lost In Translation
The new film written and directed by Sofia Coppola

How to adapt to this changing drug environment ?

EU Medicines Agencies Network Strategy to 2020

Objective 3

Support for patient focused innovation

and contribute to a vibrant life science sector in Europe

- **Greater collaboration across network to support innovation**
- **Consider further regulatory incentives for innovation, particularly in certain areas of public health need**

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EMA initiatives

- **Support to development**
  - **New Working Groups/Guidelines**
  - **SME Office and FP for Academia**
  - **SA and Qualification Procedures**

Ad hoc Working Groups

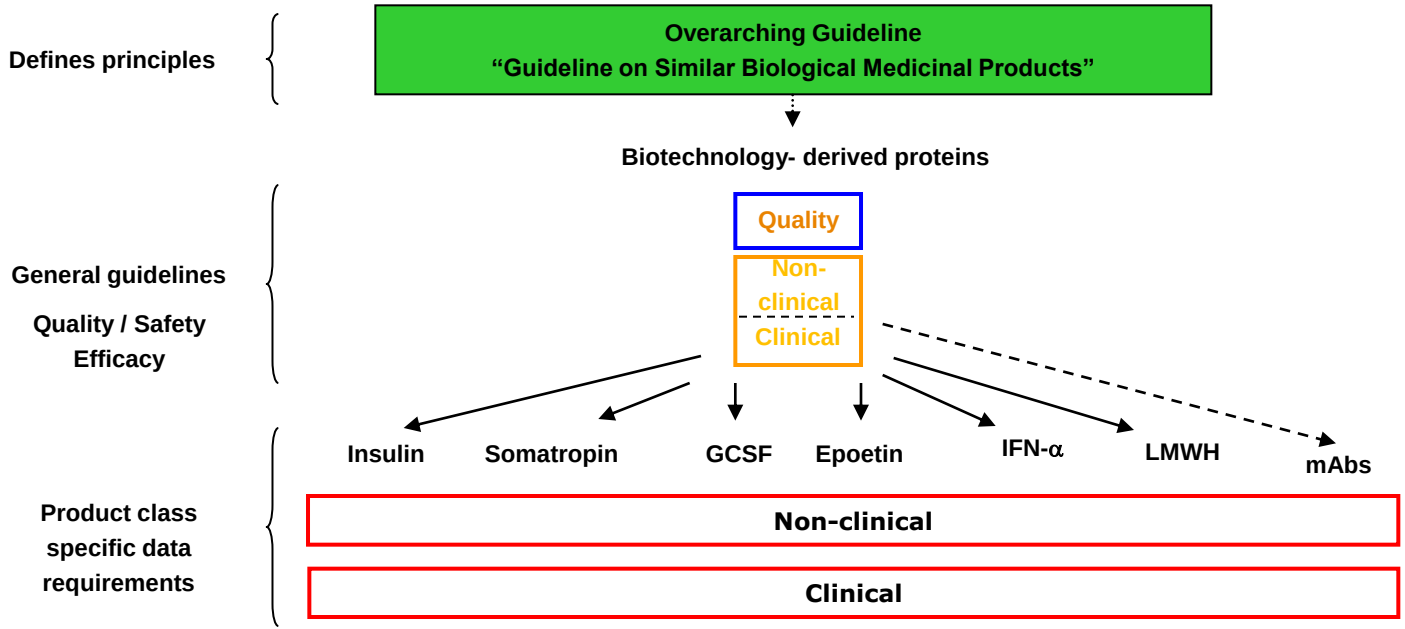
Creation of multidisciplinary groups

with scientific, regulatory and legal expertise,

forum for early dialogue with applicants

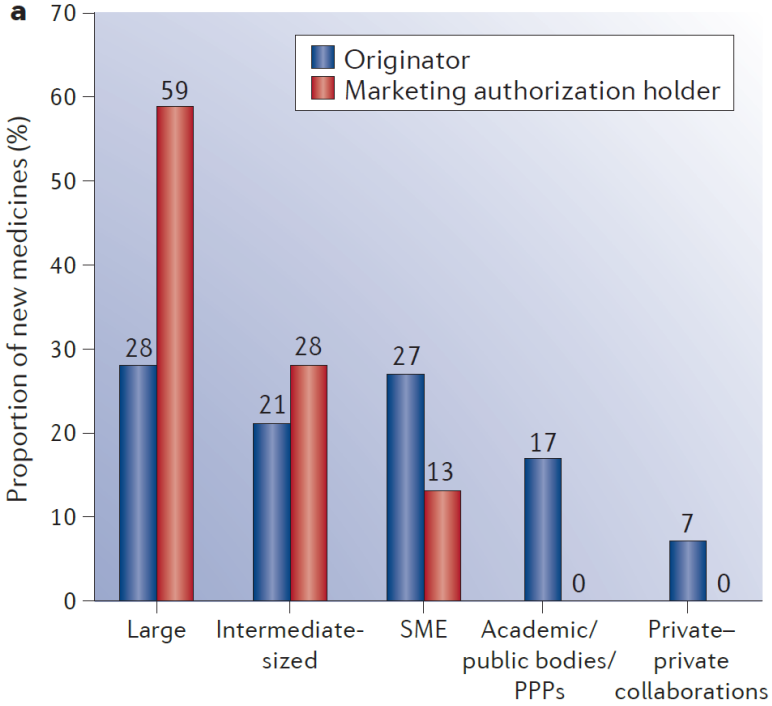
- **Committee for Advanced Therapies (CAT)**
- **Innovation Task Force (ITF)**
- **Health Care Professionals Working Parties (HCPWP)**
- **Pharmacogenomics Working Party (PGWP)**
- **Biologics Working Party (BWP)**

Biosimilar Guidelines



Where innovation comes from

Figure 1 | **Origin of new medicines in the European Union**



Lincker H et al. Nature Drug Discov 2014;13:92

EMA initiatives to promote innovation

- **Ad hoc Office to support SME**

✓ Business Pipeline Meetings

✓ Pre-Scientific Advice Meetings

- **Enhancement of relationships with Academia**

✓ Early involvement in drug development

✓ Reciprocal participation in scientific events

✓ Joint participation in research projects (IMI, Horizon 2020)

✓ Joint guidelines drafting groups

✓ Establishment of a uniform curriculum in Regulatory Sciences

Initiatives to facilitate development and MA of innovative medicines

Scientific Advice

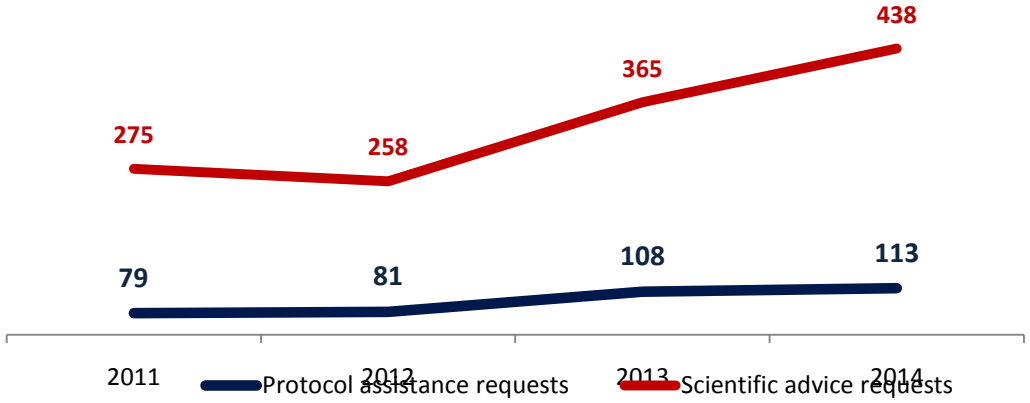
- **Before first MA**: companies ask questions on manufacturing, non-clinical and clinical trials, risk-management plans, ways to develop generics and biosimilars; significant benefit for orphan medicines; development in children.
- **Post-MA**: extension of indication to different age groups and stages of the disease; different conditions; & safety aspects.
- **Joint scientific advice with FDA**

Qualification procedures

- CHMP Qualification Advice on future protocols and methods based on the evaluation of the scientific rationale and on preliminary data.

- CHMP Qualification Opinion on the acceptability of a specific use of the proposed method (e.g. use of a biomarker) in a R&D context based on the assessment of data.

Scientific Advice – creating new opportunities



- Trends point at further growth
- 15 countries active
- Short cycle procedures (70 days)
- Strong integration in all Committee work

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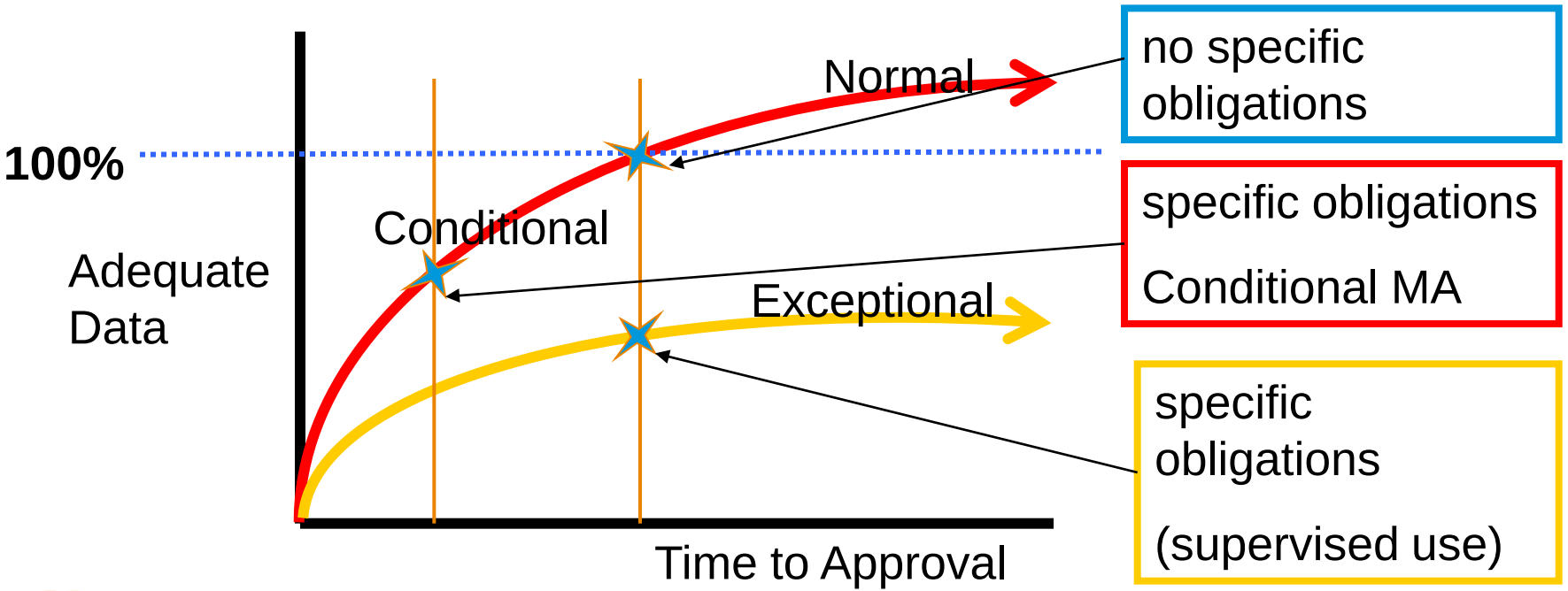
  - SA and Qualification Procedures
- New facilitated MA pathways and harnessing real world evidence and big data analytics to monitor the entire life-cycle of drug

EMA initiatives to promote innovation

- **PRIME, PRIority Medicine (accelerated pathway)**
- **New design of clinical trials (in silico, low intervention, models)**
- **Adaptive licensing**
- **PASS and PAES**
- **Publication of clinical trial data**
- **Information Technology structures to manage "Big data"**

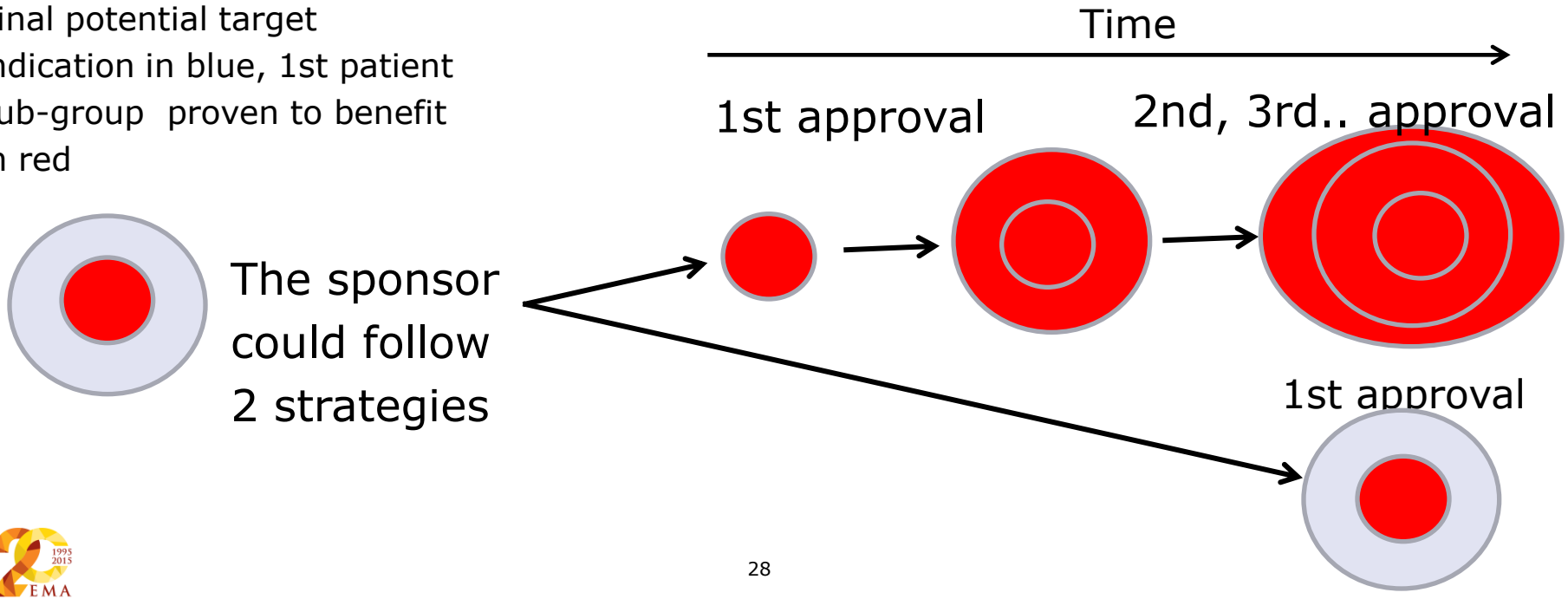
Rasi G, Bonini S. Exp Opin Biol Ther 2015; *Rasi G. Eur Drug Target Rev 2014;1:7*

Types of Approval



Adaptive pathways concept ("widening of the indication")

Final potential target indication in blue, 1st patient sub-group proven to benefit in red



Transparency policies at EMA

Pro-active publication

After public consultation and 4 workshops with all stakeholders, the Policy was approved by the EMA MB on October 2nd,2014.

First phase: publication of CSRs

Second phase: publication of IPD

EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

2 October 2014
EMA/240810/2013

European Medicines Agency policy on publication of clinical data for medicinal products for human use

POLICY/0070
Status: Adopted
Effective date: 1 January 2015
Review date: No later than June 2016
Supersedes: Not applicable

1. Introduction and purpose

The aim of the European Medicines Agency ('the Agency') is to protect and foster public health. Transparency is a key consideration for the Agency in delivering its service to patients and society.

Although the Agency since its creation has launched several initiatives to increase transparency of information on medicinal products, there is growing demand from stakeholders for additional transparency, not only about the Agency's deliberations and actions, but also about the clinical data on which regulatory decisions are based. The Agency is committed to continuously extend its approach to transparency and has, therefore, taken the initiative to develop a policy on publication of clinical data, in accordance with article 80 of Regulation (EC) No 726/2004[1]. Consultations with a broad range of stakeholders and European Union (EU) bodies have taken place in drafting this policy. It should be noted that this policy is without prejudice to Regulation (EC) No 1049/2001[2], and, therefore, it does not replace the existing 'Policy on access to documents (related to medicinal products for human and veterinary use)' (POLICY/0043) (EMA/110196/2006), which came into effect in December 2010. Moreover, the provisions of this policy are not intended in any manner to limit the application or the rights given by Regulation (EC) No. 1049/2001. Any natural or legal person may continue to submit a request for access to documents to the Agency independently of the proactive publication mechanisms established by this policy.

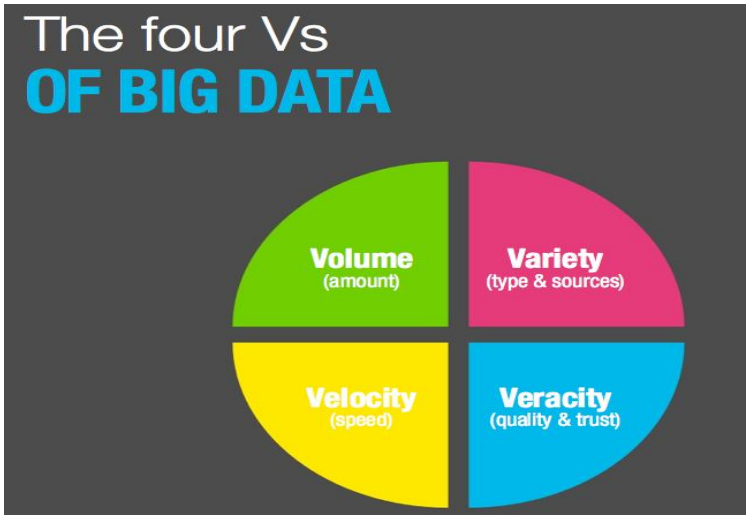
Bonini S et al. New Engl J Med 2014; 371:2452-55

The challenge ahead: omics and "Big Data"

Data will be available but

- Who is there to monitor the quality and interpret this data?
- Are physicians ready to their new role of investigators and to use data collected by their patients?

- Massive amounts of data
- New kind of follow up, with new medical challenges



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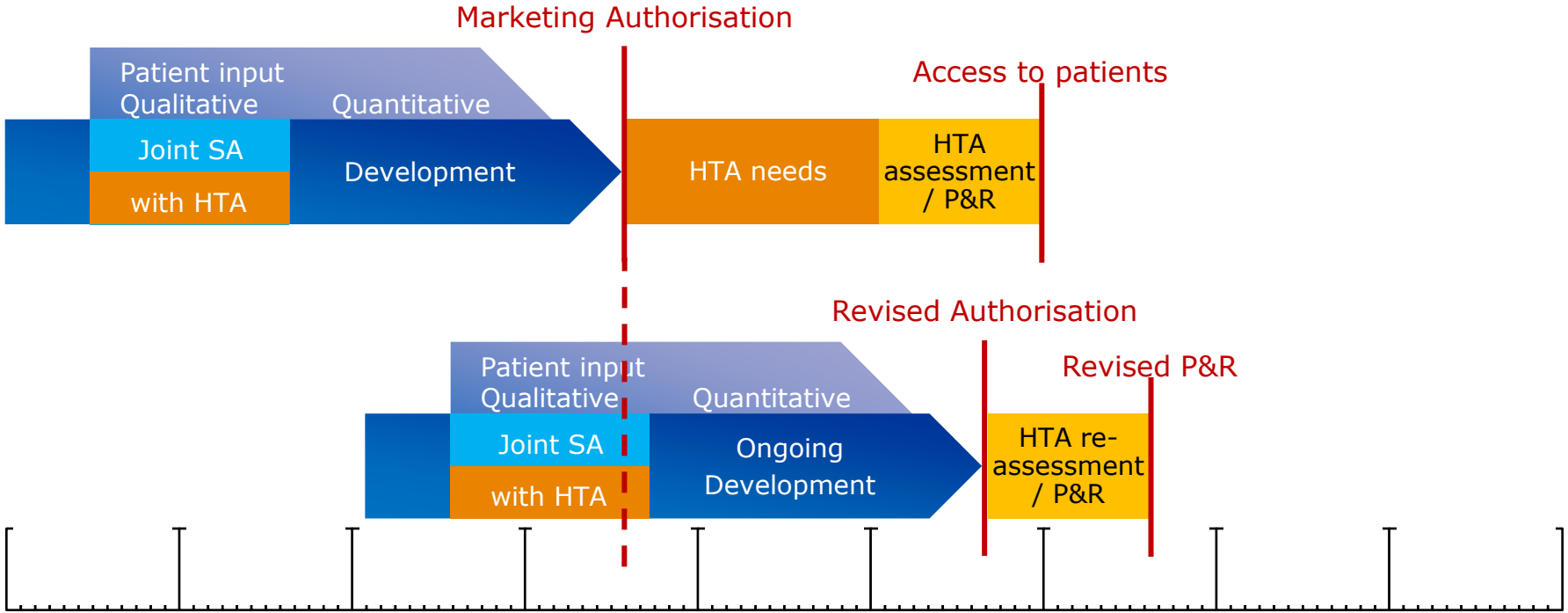
- New facilitated MA pathways and real world evidence and big data analytics to monitor the entire life-cycle of drug

- Joint SA/HTA

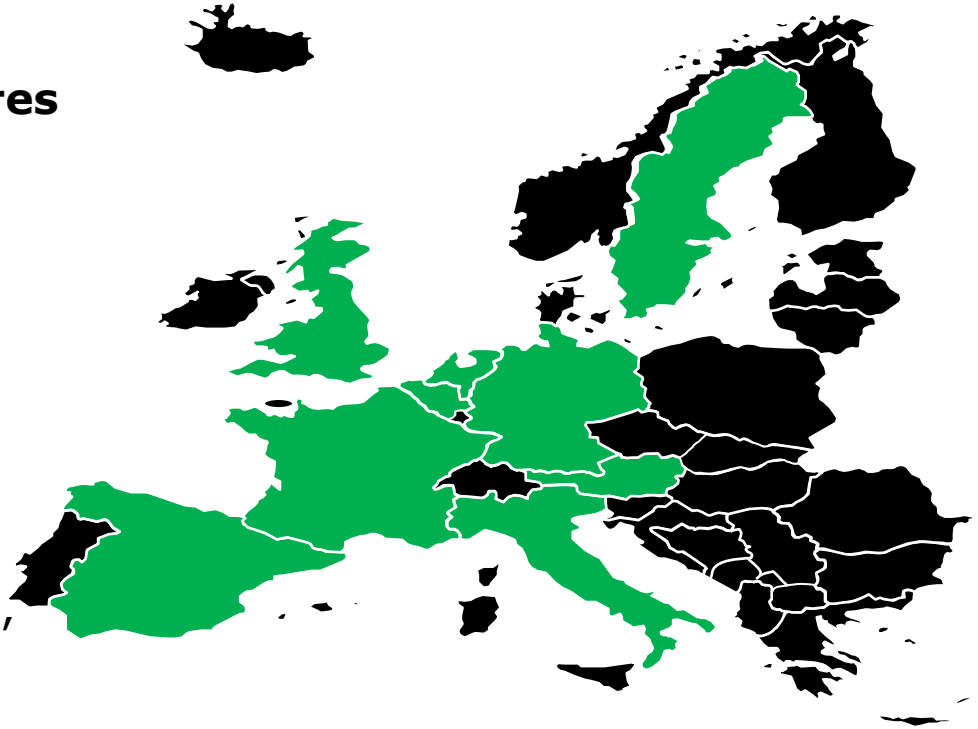
Benefits of a one-stop-shop?

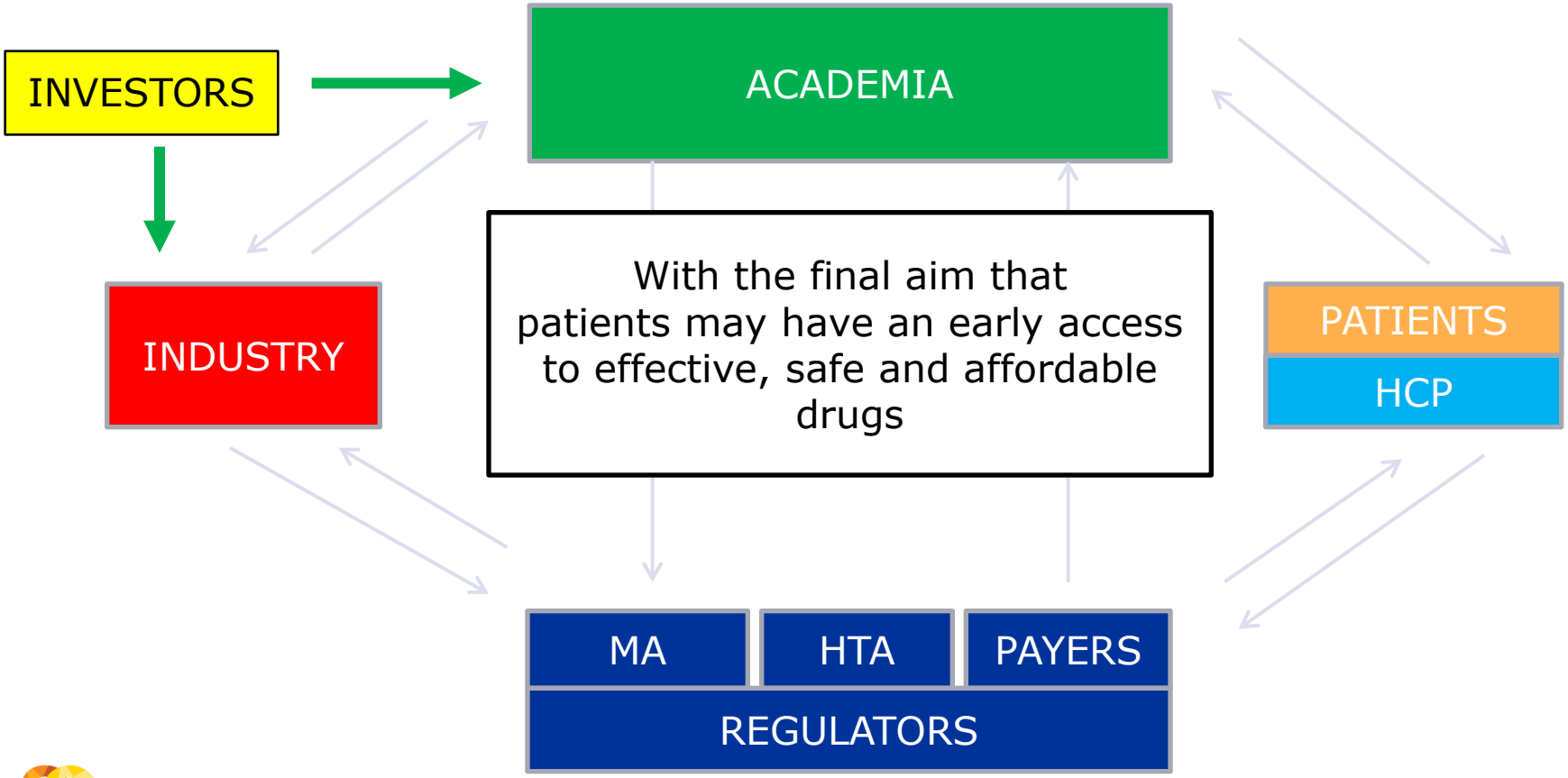


EMA-HTA parallel SA: Experience so far

- **62 parallel EMA–SA procedures** with EU 17 HTA bodies from11 Countries

- **Broad range of indications**: Lung cancer, Breast cancer, Pancreas cancer, Melanoma, Asthma, COPD, Diabetes, Heart Failure, Depression, Alzheimer's, Infections, Rare diseases




INVESTORS
ACADEMIA
INDUSTRY
With the final aim that patients may have an early access to effective, safe and affordable drugs
PATIENTS
HCP
MA
HTA
PAYERS
REGULATORS

Conclusions

- **Regulators are adapting to the rapidly changing world of medicines**
- **EMA has implemented several initiatives to enable a patient-centring innovation**
- **Innovation, however, can only be achieved with a close collaboration of all health care stakeholders, including regulators, patients, politicians, industry, academia, health care professionals and investors, in a global perspective**
- **Hopefully this collaboration for innovation will revert the decline in pharmaceutical R&D efficiency recently observed in Europe and allow European citizens to have a rapid access to effective, safe and affordable treatments**