



International Rare Diseases Research Consortium

EU Research funding for rare disease research



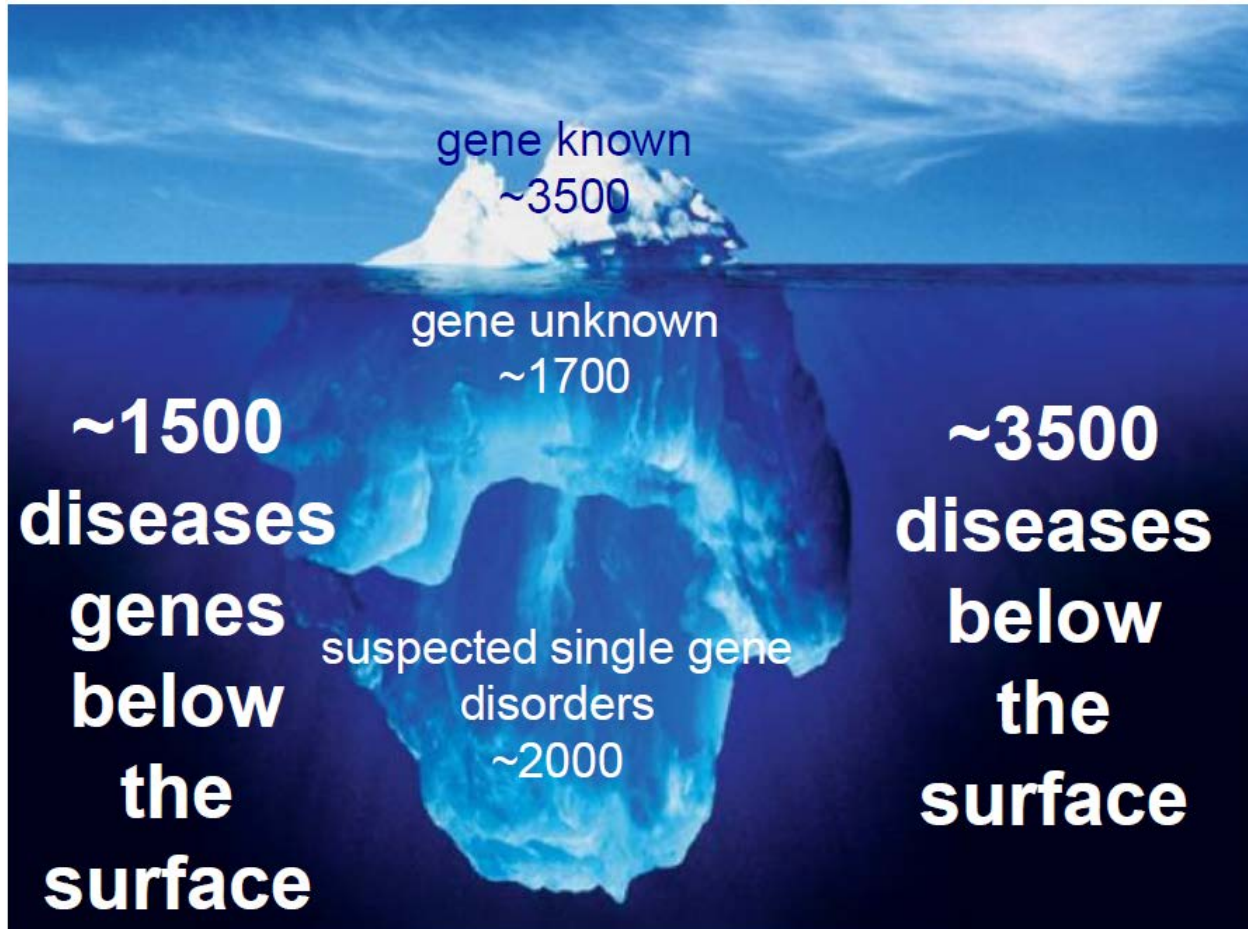
Irene Norstedt, Head of Innovative and personalised Medicine Unit,
Research & Innovation DG, European Commission

Rare diseases: a challenge too big to be mastered alone

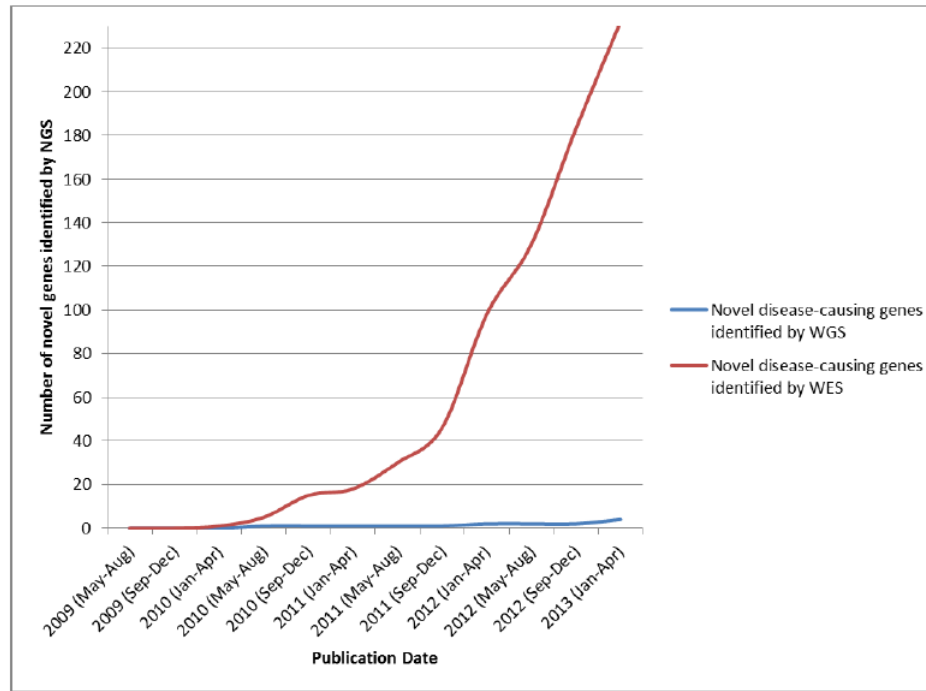
- Huge unmet medical needs for patients across the globe
- Small patient populations
- Scarce and scattered research resources and expertise



Rare Disease Genes and Rare Disease Phenotypes



Rate of RD Gene Discovery



~ 150 disease genes identified per year

If 1500 RD genes to identify – 10 years - 2024

Orphan medicines: current EU situation

- **85 orphan medicines** authorised by the EC covering **101 therapeutic conditions**
- **1013 medicines** under research and development **designated** as **orphan medicines**
- **1232+ designations** given by the EC covering **~ 521 conditions**





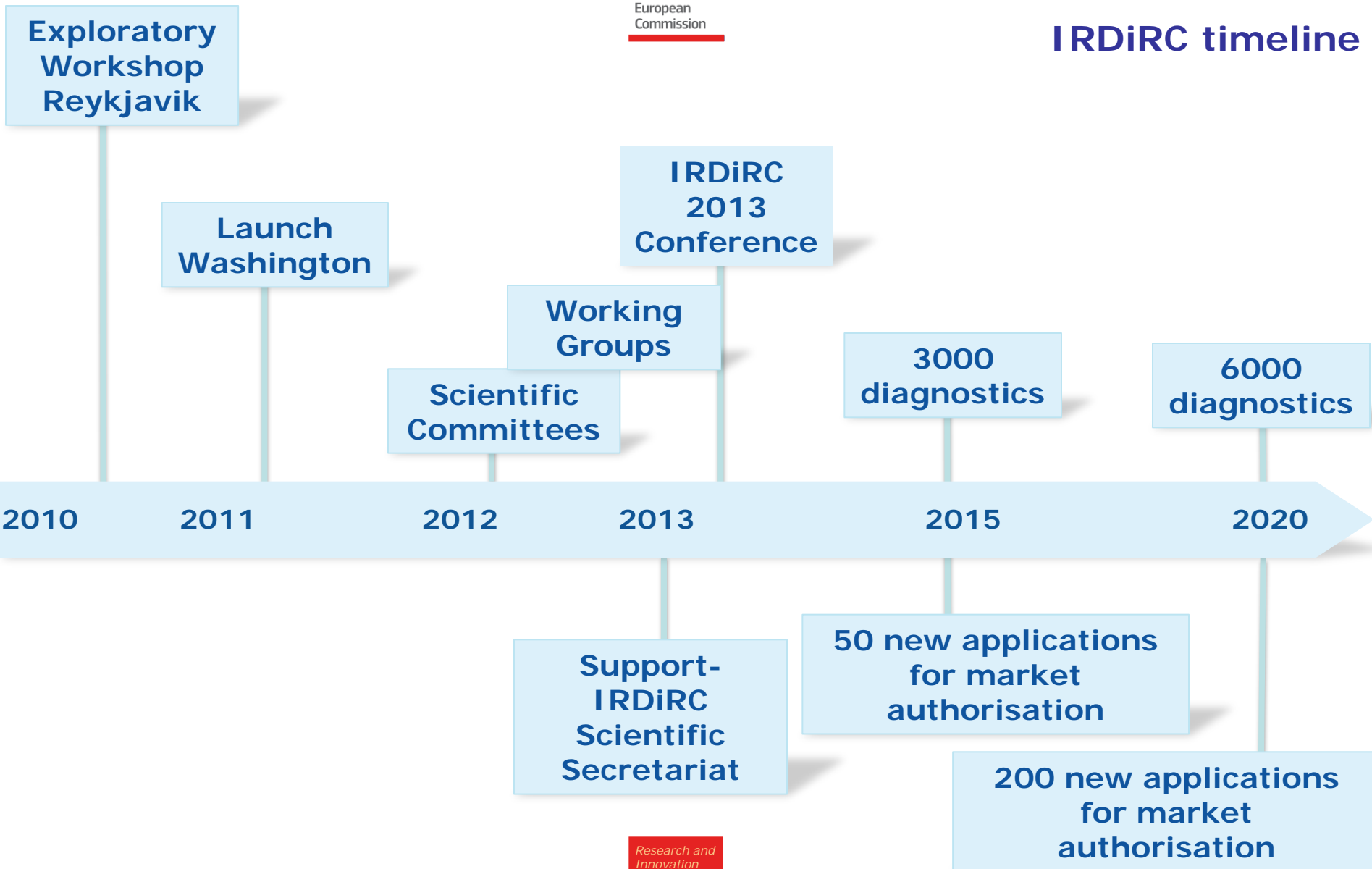
IRDIRC

INTERNATIONAL
RARE DISEASES RESEARCH
CONSORTIUM

**200 therapies
and
means to
diagnose most
rare disease by
2020**



IRDiRC timeline



Committed members

Europe

E-RARE 2 Consortium (EU)

European Commission (EU)

EURORDIS (EU)

Academy of Finland (FI)

French Muscular Dystrophy Association (FR)

French National Research Agency (FR)

Children's New Hospitals Management Group (GE)

German Federal Ministry of Education and research (DE)

Italian Higher Institute of Health Research (IT)

Italian Telethon Foundation (IT)

Lysogene (FR)

Netherlands Organisation for Health Research and Development

Prosensa (NL)

Spanish Carlos III Health Institute (ES)

UK National Institute for Health Research (UK)

Australia

National Health and Medical Research Council

Asia

BGI (CN)

Chinese Rare Disease Consortium (CN)

Korea National Institute of Health (KR)



North America

Canadian Institutes for Health Research (CA)

Genome Canada (CA)

FDA Orphan Products Grants Program (US)

Genetic Alliance (US)

Genzyme (US)

Mendelian Disorders Genome Centres (US)

National Centre for Translational Sciences (US)

National Cancer Institute (US)

National Institute of Neurological Disorders and Stroke (US)

National Institute of Arthritis and Musculoskeletal and Skin Diseases (US)

National Institute of Child Health and Human Development (US)

National Eye Institute (US)

NKT Therapeutics (US)

NORD (US)

Office of Rare Diseases (US)

PTC Therapeutics (US)

Sanford Research (US)

Shire (US)

Basic principles

- Teams up public and private organisations investing in rare diseases research
- Research funders with relevant programmes >\$10 million US over a 5-year period can join & work together
- Each organisation funds research its own way
- Funded projects adhere to a common framework
- Agree to share data / standards

Alignment – Flexibility - Commitment

Governance Structure

1 representative per funding body
// 1 representative per group of funders (accumulative funding) //
Representatives of umbrella organisations of patient advocacy groups // Chairs of the Scientific Committees

Executive Committee

SCIENTIFIC COMMITTEES
Approx. 15 members with balanced representation of scientists, patients, industry, etc.

Interdisciplinary

Therapeutics

Diagnostics

Ethics and governance

Biobanks

Biomarkers for disease progression and therapy response

Small molecules
Repurposing

Ontologies

Sequencing

Registries and natural history

Bio-informatics and data sharing

Biotechnology

Regulatory

Model systems

Genome / Phenome

WORKING GROUPS
Representatives of funded projects

IRDIRC Policies & Guidelines

- **Common framework with separate sections for researchers and funders**
- **Policy:** principle which consortium members agree to follow. IRDiRC will periodically review its policies
- **Guideline:** recommendations made by IRDiRC scientific committees/working groups that offer advice as to “best practices” at a given time



Policies and Guidelines for Researchers

Sharing and collaborative work in RD research

Sharing of data and resources, Rapid release of data, Interoperability and harmonisation of data, Data in open access databases

Scientific standards, requirements and regulations in RD research

Projects should adhere to IRDiRC standards, Develop ontologies and biomarkers, Cite use of databases and biobanks in publications

Participation by patients and / or their representatives in research

Act in the best interest of patients , Involve patients in all aspects of research, in governance of registries and in the design, conduct and analysis of clinical trials, Acknowledge patients contribution in articles

Policies and Guidelines for Funding Bodies

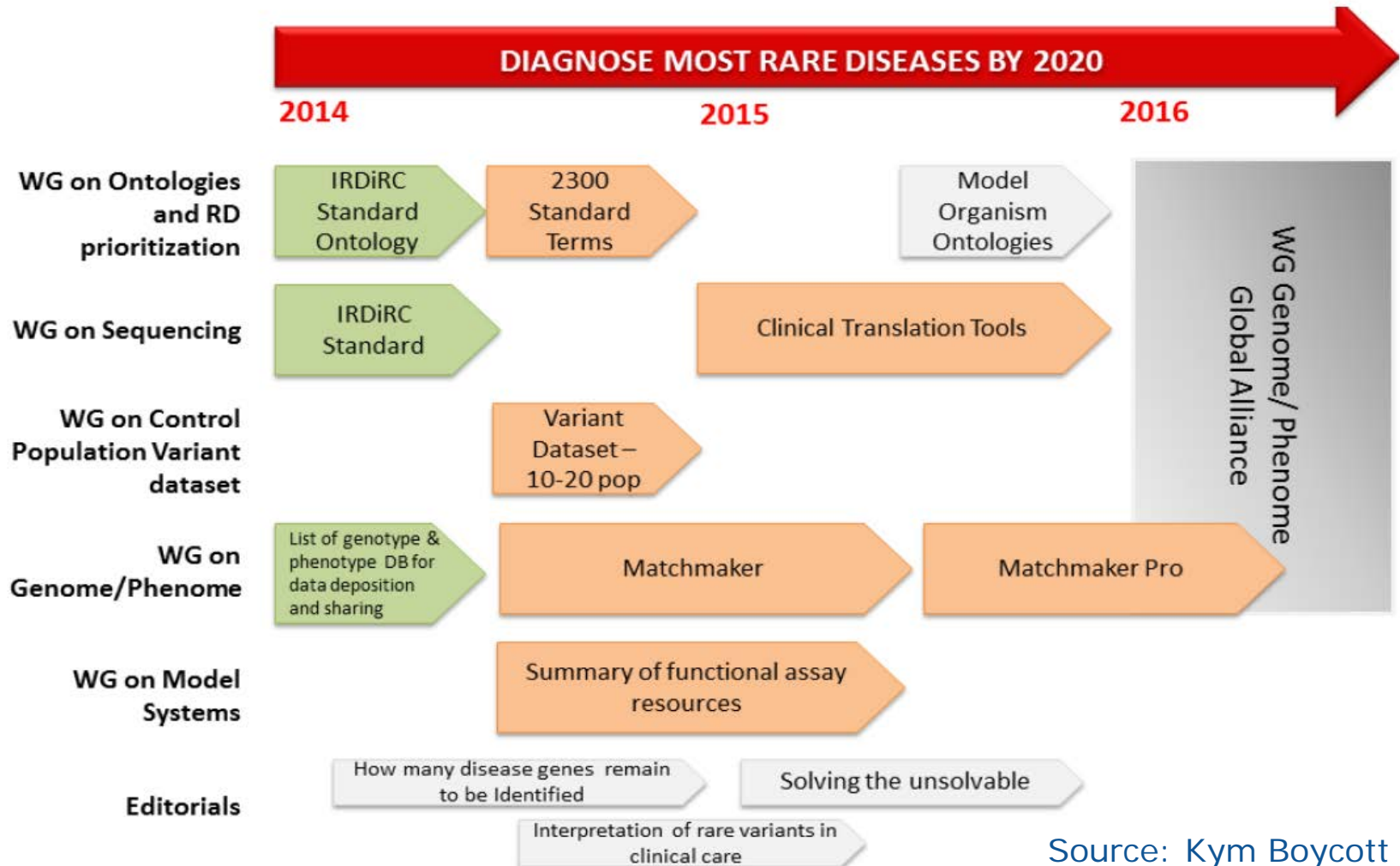
Promote the

- discovery of genes
- development of therapies
- harmonisation, interoperability, sharing result, open access data
- coordination between human and animal models
- active exchanges between stakeholders through information dissemination of ongoing projects and events

IRDiRC Roadmap (work in progress)

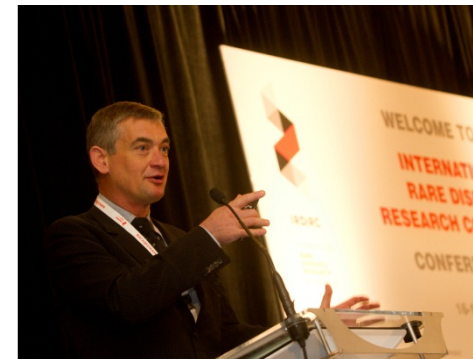
- Identification of standards to promote and key infrastructures
- Adoption of a core set of 2,372 terms to describe human phenomes
- Adoption of the Human Phenome Ontology
- Adoption of the Orphanet Rare Diseases Ontology
- Communication / Dissemination by IRDiRC and by IRDiRC members

Example: IRDiRC - diagnostics



IRDIRC Conferences

- **First IRDiRC Conference**
 - Dublin, Ireland, April 16-17 2013
 - Organised by EC, 400+ participants
 - Read report on www.irdirc.org
- **Second IRDiRC Conference**
 - Shenzhen, China, Nov. 7-9, 2014
 - Organised by BGI
 - **SAVE THE DATE**





Rare diseases

*How Europe is meeting
the challenges*



The EU: A major player in funding health research in rare diseases

- Over two decades of investment in the area
- Over **€ 620 million** invested in close to **120 projects** launched in FP7
- Continued strong investment in Horizon 2020



47 projects
€ 64 million



59 projects
€ 230 million



~ 120 projects
>€ 620 million

ALPHA-MAN: Building on successes from FP5 and FP6 in FP7

From biochemical characterisation of mutations in the alpha-Mannosidase gene to “First in Man” clinical trials in patients

- Genetic and biochemical characterisation of mutations in the alpha-Mannosidase gene
- Pre-clinical Enzyme Replacement Therapy protocol using recombinant human enzyme in a mouse model
- Large-scale production of the recombinant enzyme
- Defined clinical endpoints for the future clinical trials in a European wide natural history study
- “First in Man” clinical trials in alpha-Mannosidosis patients of recombinant human lysosomal acid alpha-mannosidase (designation 2005)



FP5 EURAMAN



FP6 HUE-MAN



FP7 ALPHA-MAN

Coordinator: Prof. Paul Shaftig, University of Kiel



E-RARE 2 – coordinating European funders and beyond

- Yearly launching of joint calls on rare disease research
- 17 research agencies from 13 European and Associated countries
- Currently over 60 on-going projects
- Current investment of € 45,7 M (2007-2013) with EU investment of around € 2 M



Coordinator: Daria JULKOWSKA, Inserm

E-Rare1 funded
through



EuroGentest



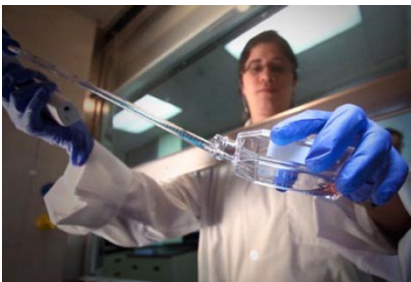
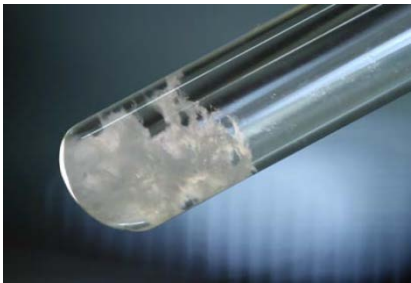
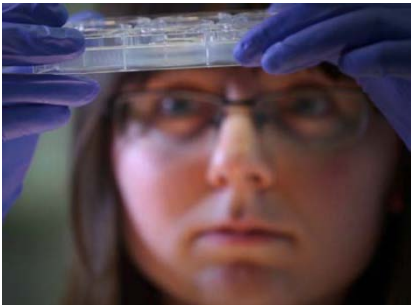
- **Harmonisation, validation and standardisation in genetic testing**
- **Support professionals in achieving high quality in all aspects of genetic testing services**
- **Provide information on genetic testing to professionals and to the public**
- **Promote the implementation of novel technologies into current practice**



EuroGentest1
funded through



Coordinator: Gert MATTHIJS, University of Leuven



EU collaborative research in rare diseases: main focus areas in FP7

- Europe wide studies of natural history and pathophysiology: in vitro/in vivo models, registries & bio-banks, identification of biomarkers
- Development of preventive, diagnostic and therapeutic interventions including pharmacological and innovative approaches

€ 200 million

2012-2013 FP7 Health Calls

8 research topics for rare diseases:

- -Omics for better understanding of diseases in view of development of new diagnostics and treatments *
- Databases, biobanks and clinical 'bio-informatics' hub
- Preclinical and clinical development of orphan drugs *
- Observational trials in rare diseases
- Best practice and knowledge sharing in clinical management
- Organisational support for IRDiRC
- Development of imaging technologies for therapeutic interventions in rare diseases *
- New methodologies for clinical trials for small population group

New Orphan Drugs

- **17 projects with an EU investment of € 80 million**
- **Several disease areas including neurology, immunology, and dermatology**
- **Call topic focus:**
 - Preclinical and/or clinical development of substances with a clear potential as orphan drugs
 - Diagnostics and therapies for rare diseases



"-Omics" for rare diseases (1)

- 2 projects focusing on rare kidney disorders and rare neuromuscular and neurodegenerative disorders
- Molecular characterisation of a large group of rare diseases using –omics technologies
- Ontologies, reference –omics profiles, diseases models, development of technologies
- New means to diagnose and allow development of new treatments for these diseases

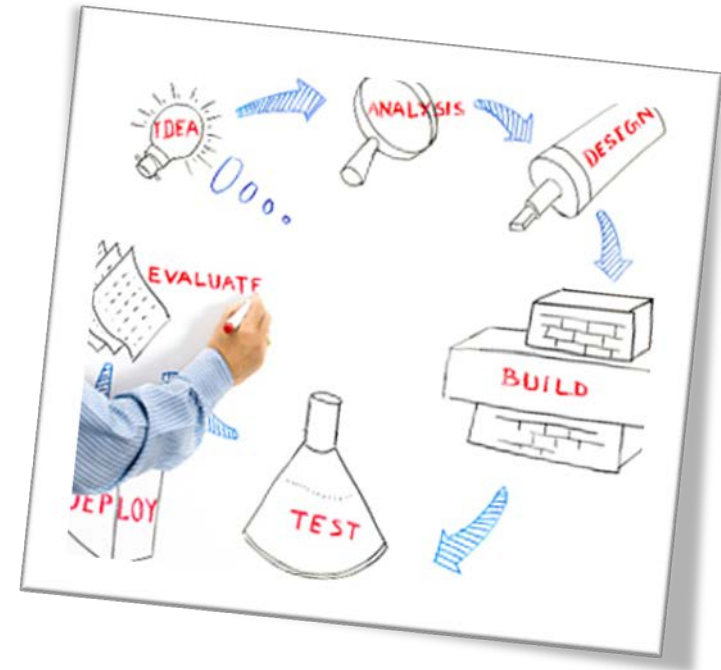


"-Omics" for rare diseases (2)

- **RD-CONNECT: platform for integrating –omics data with clinical data**
- **Connecting registries, biobanks and clinical bioinformatics**
- **Supporting collection and storage of data and samples in EUREnOmics and NEUROMICS**
- **Provides access to –omics profiles and samples**
- **Will collaborate with other IRDiRC projects**



- The EU's 2014-20 programme for research & innovation (around € 80 billion)
- A core part of Europe 2020, Innovation Union & European Research Area
- Three priorities: Excellent science, Industrial leadership, Societal challenges



HORIZON 2020

Health, demographic change and wellbeing challenge



Over € 7
billion to
health
research

- Translate science to benefit citizens
- Test and demonstrate new healthcare models, approaches and tools
- Promote healthy and active ageing
- Improve health outcomes, reduce inequalities
- Support a competitive health sector



Focus areas of 2014-2015 Work Programme

- Understanding health, ageing & disease
- Effective health promotion, disease prevention, preparedness and screening
- Improving diagnosis
- Innovative treatments and technologies
- Advancing active and healthy ageing
- Integrated, sustainable, citizen-centred care
- Improving health information, data exploitation and providing an evidence base for health policies and regulation

Topics for Rare disease research in 2014-2015 Work Programme

ERA-NET: Rare disease research implementing IRDiRC objectives (WP 2014)

New therapies for rare diseases (WP 2015)

Support for European Reference Networks: efficient network modelling and validation (WP 2015)

Other topics relevant to rare diseases

- Understanding health .. and disease ..
- Understanding diseases: systems medicine
- ..disease prevention .. translating 'omics' ..
- ..evaluating screening programmes ...
- ..new diagnostic tools .. in vitro ..
- ..tools ..technologies ..advanced therapies
- Clinical research ... regenerative medicine

See also other Work Programmes

Infrastructures ('starting communities' grant)

Marie Skłodowska-Curie Actions

European Research Council

Rare Disease Research in Horizon 2020

- Continued strong support and commitment to meet IRDiRC goals
- Focus on bringing novel therapies and diagnostics to patients
- Integrated approach with several funding opportunities/instruments





Thank you

Irene.norstedt@ec.europa.eu

<http://ec.europa.eu/research/health>

<http://ec.europa.eu/programmes/horizon2020>

Backup slides:

Diagnosics Committee

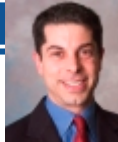
- Kym Boycott



- Han G. Brunner



- Michael Bamshad



- Xavier Estivill



- Milan Macek



- Gert Matthijs



- Woong-Yang
Park



- Peter Propping



- Pak-Chung Sham



- Jun Wang



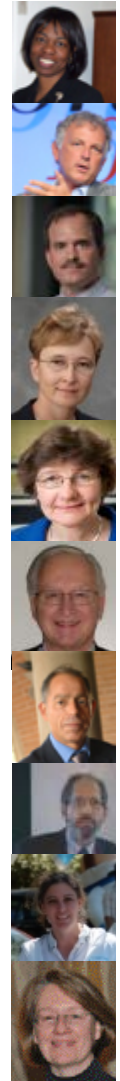


Therapies Committee

- Yann Le Cam
- Gert-Jan VanOmmen
- Giles Champion
- Seng H. Cheng
- Adam Heathfield
- Maria Mavris
- Fulvio Mavilio
- John McKew



- Elizabeth McNeil
- Luigi Naldini
- Glen H. Nuckolls
- Asla Pitkänen
- Karin Rademaker
- Robert Schaub
- Joseph Torrent i Farnell
- Marc Walton
- Ellen Welsh
- Anne Zajicek



Interdisciplinary Committee

- Hanns Lochmüller
- Jamel Chelly
- Angel Carracedo
- Jack Goldblatt
- Petra Kaufmann
- Alastair Kent



- Jeffrey Krischer
- Bartha Maria
Knoppers
- Samantha Parker
- Rumen Stefanov
- Domenica Taruscio

