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**HIGH QUALITY RESEARCH THROUGH COMPETITIVE FUNDING:
LESSONS FROM THE EUROPEAN RESEARCH COUNCIL**

Perspectives:

- Medical training, career in basic research
- Chair of Medical Research Council (Academy of Finland)
- several different expert duties in EC, ESF, ESFRI, EMBL etc
- Chair of Expert Group for impact assessment of health research in FP6 and FP7 (2011)
- Chair of Identification Committee for ERC Scientific Council members

Expert Group for impact assessment of health research in FP6 and FP7 (2011)

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Fragmentation of funding streams for health research in Europe -> better coordination,
Paradigm shift in basic medical research -> big science; biobanks, databases, registries, high-throughput techniques = infrastructures

The **European Commission** has made several efforts to reduce fragmentation of health research funding in Europe:

- FP-specific research funding instruments (IP, NoE etc),
- Instruments aimed at bringing funders to close collaboration (e.g. ERA-NETs and ERA-NETs Plus),
- New initiatives for large scale collaborative programmes; EDCTP, Innovative Medicines Initiative (IMI) and Joint Programming Initiatives (JPI) for pan-European collaborations have served as models for new types of collaboration,
- Research infrastructures (BBMRI, EATRIS, ELIXIR, ECRIN etc)

Ongoing **paradigm shift** in health research,
prevention, diagnostics and treatment:

personalized medicine

stratification of diseases

precision medicine

systems medicine ("P4 medicine": predictive,
preventive, personalized and participatory)

Europe has a golden opportunity to take the lead in
this new type of new medical research (population
records, cohorts and registries; social health care
system, compliant population; research infrastructures,
biobanks, cancer registries etc.)

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In 2008, EU countries spent on average 8.3% of GDP on health.

About 75% of health financing comes through public sources (general taxation or social security contributions). Private financing averages around 2% of GDP.
-> A strong investment in biomedical research will be essential to help keep a potentially increasing disease burden and the associated health costs under control

Compared to funding by the National Institutes of Health in the United States, Europe is lagging seriously behind in every aspect of health research funding.

FP7 contribution to health related-research is 6.1 billion Euros (12 % of the total FP 7 budget).

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“Recommendation 5

In the lifecycle of FP8 and moving towards 2020, design and by year 2020 implement the establishment of the **”European Health Research and Innovation Institutes”** (EHRII), analogous to the US model of National Institutes of Health (NIH) but adapted to the European realities and scientific strengths, in line with the Europe 2020 and Innovation Union strategies.”

Q: Top-down

or

bottom-up?

A: both:

Framework Programmes

and

European Research Council

European Research Council (ERC)

Three domains; HS, PE and LS (life sciences)

LS domain: 9 panels (LS1-LS9):

LS1 Molecular and Structural Biology and Biochemistry,
LS2 Genetics, Genomics, Bioinformatics and Systems Biology,
LS3 Cellular and Developmental Biology,
LS4 Physiology, Pathophysiology and Endocrinology,
LS5 Neurosciences and neural disorders,
LS6 Immunity and infection,
LS7 Diagnostic tools, therapies and public health,
LS8 Evolutionary, population and environmental biology,
LS9 Applied life sciences and biotechnology.

LS1 Molecular and Structural Biology and Biochemistry: molecular biology, biochemistry, biophysics, structural biology, biochemistry of signal transduction

LS2 Genetics, Genomics, Bioinformatics and Systems Biology: genetics, population genetics, molecular genetics, genomics, transcriptomics, proteomics, metabolomics, bioinformatics, computational biology, biostatistics, biological modelling and simulation, systems biology, genetic epidemiology

LS3 Cellular and Developmental Biology: cell biology, cell physiology, signal transduction, organogenesis, developmental genetics, pattern formation in plants and animals

LS4 Physiology, Pathophysiology and Endocrinology: organ physiology, pathophysiology, endocrinology, metabolism, ageing, regeneration, tumorigenesis, cardiovascular disease, metabolic syndrome

LS5 Neurosciences and neural disorders: neurobiology, neuroanatomy, neurophysiology, neurochemistry, neuropharmacology, neuroimaging, systems neuroscience, neurological disorders, psychiatry

LS6 Immunity and infection: immunobiology, aetiology of immune disorders, microbiology, virology, parasitology, global and other infectious diseases, population dynamics of infectious diseases, veterinary medicine

LS7 Diagnostic tools, therapies and public health: aetiology, diagnosis and treatment of disease, public health, epidemiology, pharmacology, clinical medicine, regenerative medicine, medical ethics

LS8 Evolutionary, population and environmental biology: evolution, ecology, animal behaviour, population biology, biodiversity, biogeography, marine biology, ecotoxicology, prokaryotic biology

LS9 Applied life sciences and biotechnology: agricultural, animal, fishery, forestry and food sciences; biotechnology, chemical biology, genetic engineering, synthetic biology, industrial biosciences; environmental biotechnology and remediation;

The amount of funding that the ERC will provide for "health research" is hard to estimate given the ERC's non-prescriptive approach. Arguably most of the Life Sciences domain (and non-trivial parts of our other domains) could be relevant. A recent estimate: around Euro 1,465m (equivalent to 50% of the LS domain) to "health research" over the course of FP7.

The overall budget for the ERC from FP7 for 2007 - 2014 is 7,510 million euro*.

The Scientific Council has established the following budget breakdown for each of the three main research domains:

Physical Sciences & Engineering: 44%

Life Sciences: 39%

Social Sciences & Humanities: 17%

The LS Domain will therefore receive around 2,900 million euro over FP7.

Within the domains the budget per panel in a particular call is allocated based on demand (the requested budget of the proposals for each panel).

In the completed calls so far the **LS7 Diagnostic tools, therapies and public health panel** has funded 120 grants for a total of 223 million euro. This represents 5.2% of the total 4,268 million euro granted until now as a result of these calls and corresponds to around 13% of the LS budget. Per call the amount of funds to LS7 has varied between 3.7% and 6.1%. Therefore about 5% of the ERC budget will go to LS7 over the course of FP7, that is about 375 million euro.

EXAMPLES OF ERC-FUNDED PROJECTS IN HEALTH AND BIOMEDICAL RESEARCH

When asthma bites the dust

A new drug delivery system

Tackling obesity: Adipose tissue mass regulation

Biotechnology and Health: Molecular by-pass therapy for mitochondrial dysfunction

Diabetes drug could counter the development of breast cancer cells

Robotic colonoscopy: getting a grip on cancer

Detecting and monitoring cancer via exhaled breath

Health consequences of noise exposure from road traffic

Better nutrition for better eyesight

Bio-inspired optical corrections of presbyopia

Understanding signalling pathways of astrocytes to treat neurological conditions

Understanding the role of stem cells in skin cancer

Studying plasticity of the normal brain to understand neurological disorders

Cellular and Developmental Biology: Understanding cell cycle to fight cancer and other diseases

Cancer Epidemiology: Opening new avenues for research cancer in Europe

Multiple sclerosis grants:

Can we prevent the self-destruction of the myelin sheath?

Can the damage to the myelin sheath be reversed?

Which promises hold stem cell therapies for MS?

Physical Sciences and Engineering (PE) domain

Instant chemical analysis to guide cancer surgery

Nanotechnology to help rebuild bodies and detect disease

Bone grafts for transplantations

Social Sciences and Humanities (SH) domain

Understanding Health Across The Lifecourse

Improving movement's control through sensory information

The effect of norepinephrine in learning and memory, and its influence on human cognition