CHAPTER 3
RESEARCH

Research makes a direct contribution to the prevention and treatment of lung diseases and leads to dramatic increases in the quality of life for European citizens. Biomedical research is vital and Europe will need to significantly increase its investments to remain competitive.
The best way to tackle a problem is to fully understand it. Medical research offers us an excellent tool for understanding the causes of respiratory diseases, how they progress and what happens inside our bodies. Research aiming at understanding mechanisms and key pathways of disease will in future improve the early detection, diagnosis and treatment of respiratory diseases. Moreover, respiratory medical research has been shown to represent a six-fold return on investment.\textsuperscript{35}

Research into lung disease has yielded many life-changing results, such as the development of new effective asthma treatment, the increased success of lung transplants, better treatments of cystic fibrosis and proving the link between smoking and lung cancer. However, there are many questions that remain unanswered and many conditions that still do not have adequate treatments.

INNOVATION STRATEGIES FOR RESPIRATORY DISEASES

Biomedical research is vital and the future national and European research programmes must reflect this to a greater extent in the next decade. More investment at the EU and national level in medical research is all the more important given that we are close to breakthroughs in many areas of respiratory diseases, such as molecular bacteriology and virology, development of vaccines and anti-viral agents, boosting host defence and innate immunity, molecular pathology and personalised care for lung cancer.

Alliance for Biomedical Research in Europe to increase innovation and competitiveness

Biomedical research in Europe is facing unprecedented challenges, and funding and support for research is far below what is needed for sustained European competitiveness. New insights and therapeutic strategies are desperately needed to cope with specific healthcare problems of the ageing population. ERS along with the European Association for the Study of Diabetes (EASD), the European Society of Cardiology (ESC) and the European Cancer Organisation (ECCO), is one of the four founding medical societies of the

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\includegraphics[width=\textwidth]{figure11.png}
\caption{The EU Research and Development Framework programme (FP7) budget (excluding EURATOM), including the allocated budget for the FP7 Health theme, which forms part of the FP7 Cooperation programme.}
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Alliance for Biomedical Research in Europe, which aims to give a single, powerful voice to the biomedical research community across Europe and to serve as a key stakeholder at EU level on the future EU biomedical research needs, see www.biomedeurope.org


FP7 bundles all research-related EU initiatives together under a common roof with four major programmes: Cooperation (collaborative research), Ideas (basic research), Marie Curie Actions (fellowship) and Capacities (research infrastructure). The budget for health research in FP7 constitutes just over 10% of the entire FP7 budget (fig. 11).

The health theme is one of the major themes of the FP7 Cooperation programme and the EU has earmarked a total of €6.1 billion for funding this theme over the duration of FP7. Analysis of the FP7 budget between 2007 and 2010 shows that 4.3%, i.e. €261 million, of the budget was devoted to respiratory-related research, but only 0.5% of the health budget went to research on asthma and COPD, constituting some €30 million (fig. 12).

COPD and asthma are the diseases that pose the greatest challenge in terms of morbidity and especially in terms of the direct and indirect costs to society. In 2010, COPD alone was estimated to have cost the global economy $400 billion. A more strategic investment or mechanism for a dedicated and specific research strategy right across the biomedical sphere and, in particular, for common respiratory diseases at EU level, is needed if the aims of the Innovation Union, a central pillar of the Europe 2020 strategy, are to be met.

More innovative collaborations between industry and academia

There is a great need to find new, effective ways for collaboration between academic research and innovators, in order to develop better medicines and improved diagnostic methods. A significant problem is the real deficiency of new innovative medicines in the respiratory field, as only nine new therapies have been developed over the past 40 years. The main reason for this being that most targets that the industry chose to pursue in the respiratory therapeutic area failed, and resulted in no new treatments. This underlines that Europe needs to empower and regain creative talent in the discovery phase of research and development.

KEY POLICY RECOMMENDATIONS FOR FUTURE RESEARCH IN LUNG HEALTH

Research and innovation to meet the grand societal challenges

- The EU and Member States need to significantly increase their investments and better coordinate their research and innovation cooperation in the biomedical domain if we are to effectively meet the grand societal challenges such as an ageing population and the growing prevalence of chronic diseases. Member States need to work together and supranational cooperation should be facilitated. Only then can true innovation and progress occur.
- Cross-boundary and international research are key for successful and innovative biomedical research. Only the European Research Area can provide the necessary critical mass and complementarities for the comprehensive and multidisciplinary approach that is needed.
- In view of the growing global epidemic in non-communicable diseases, the EU and Member States must further focus their priorities on non-communicable chronic diseases, which cause 86% of deaths in Europe.

• Not only does Europe need a truly European research programme for biomedical research, but also a dedicated infrastructure for managing such health and biomedical research would need to be set up. The innovation cycle in biomedical research is long (about 10 years) and one funding instrument cannot cover the full innovation cycle from developing ideas into novel concepts, translating these into clinical practice, taking findings to the market, evaluating treatment strategies and monitoring outcomes.

• To be able to develop the right balance between top-down and bottom-up approaches, there is a need for the European Commission to consult more closely with and involve all stakeholders, including professional medical societies, at the very early conceptual stages of defining future biomedical research priorities. This would ensure development of a biomedical research programme that corresponds to the reality of the full biomedical innovation cycle.

• Collaborative projects must remain the cornerstone of the EU research framework programme, as collaboration is the key component in each stage of the innovation cycle. The composition and size of consortia should depend on the nature of the project. Scientific excellence must always be the most important and overriding criterion and the driving force for selection and awarding research projects.

• The EU and Member States should ensure sustainability and consistency of EU research projects, networks and infrastructures that have accomplished unique results and that need to be further developed into real successes and to deliver exploitable results.

**Translational and clinical research to foster competitiveness and innovation**

• ERS advocates for future EU research framework programmes to divert greater resources to support translational research in respiratory diseases. In clinical research, the entire European population must be considered when gathering data and designing new therapies and treatments.

• Epidemiological data is a core element in translational research and is needed for all respiratory diseases, to identify clinically important associations in a population, further fuelling basic science investigation. The division of funding resources should be based on public health needs based upon comparable health data, and the burden and cost of disease in Europe.

• Challenges and societal needs in healthcare call for a more directed funding approach, focusing research in certain areas. We would advocate for a bottom-up collaborative research approach with an ERC-type\(^ {37}\) funding of research driven by excellence.

**Fostering better collaborations and international mobility**

• A better collaboration between fundamental researchers, clinicians and the pharmaceutical industry will be essential to stimulate new drug development. Novel models of industry–academia collaboration such as the Innovative Medicines Initiative should be further improved as a way to move drug development forward.\(^ {38}\)Current hurdles need to be overcome, such as lack of awareness, the high level of complexity in implementing IMI projects, intellectual property barriers and problems with administrative load.

• Europe needs a strong new generation of medical researchers who are trained to tackle different aspects from basic research to translational and clinical research and who can support the chain of innovation. To deliver innovations, there will be a continuous need to train more respiratory scientists, both clinical and non-clinical, but also to support international mobility. The concept of introducing “MD-PhD programmes” for the postgraduate education of MD PhD fellows at EU level should be considered, along with expanding the Marie Curie Actions.

• Patient involvement as an equivalent partner in scientific research should be increased. Patients are an important source of knowledge and expertise on their disease experiences, and can contribute to the development of patient-reported outcome measures.

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\(^{37}\) ERC: European Research Council. The ERC approach provides examples for pure excellence-based and bottom-up research.