

## Editorial

## Scientific Societies and Biomedical Research

## Sociedades científicas e investigação biomédica

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The role of scientific societies in the promotion of biomedical research is becoming increasingly important, particularly when the political and financial situations across Europe (and the world) are facing unprecedented challenges. The whole field of biomedical research in Europe is therefore in a difficult position, considering that research is usually one of the first victims of global crisis. Some signs are already quite visible. Indeed, funding and support for research are far below that which has long been promised and is needed for sustained European competitiveness and innovations in biomedicine.<sup>1</sup> The commitment by the European Union (EU) in 2002 (Barcelona Declaration) to gradually increase the share that the EU dedicates to research and development (R&D) to 3% of its gross domestic product (GDP) by 2010 has not been fulfilled. Currently the EU budget for research amounts to only 1.8% of its GDP. Furthermore, statistics recently published by the United Nations Educational, Scientific and Cultural Organization showed that from 2002 to 2007 European investment had stagnated. This is clearly in contrast with the main European competitors, the United States (US) or Japan, who dedicate 2.7% and 3.4%, respectively, of GDP to R&D. In addition, China is investing massively in R&D, with a 160% increase in investment between 2002 and 2007, representing 1.75% of GDP, and a plan to increase to 2.2% of GDP by 2015.<sup>1</sup>

Adequate funding is, therefore, critical for continued advancement in cardiovascular disease research. As an example of disparities, Framework Programme 7, the main European Program for Research Grants, receives 6 billion Euros, some 10% of the total 2008–2013 research budget. By comparison, the National Institutes of Health (NIH) budget was approximately \$30 billion in 2008, with about \$3 billion directed toward the National Heart, Lung, and Blood Institute, the institute most directly involved with cardiovascular research.<sup>2</sup> An important consideration that is also increasingly relevant is to assess the return on investment, which can be looked at in different ways. One of them is certainly in terms of the quality and quantity of research publications that originate from the funded research, particularly the ones in high impact journals, which in the end will have much wider visibility and potential impact. In a recent study Lyubarova et al. assessed the impact of NIH funding on published US cardiovascular disease

research.<sup>3</sup> By including 36 684 US articles on cardiovascular disease published during the 11-year study period, the data set was very comprehensive. The US accounted for about one third of worldwide publications on cardiovascular disease, with a relative emphasis on large clinical trials and review articles. The NIH funded 28% of US articles, with an emphasis on basic science research. Most large US clinical trials received alternative funding, typically from industrial sources. Multiple-method NIH-funded studies were more likely to be published in high impact journals. Both overall US cardiovascular publications and NIH-funded publications increased, but at roughly equivalent rates such that the ratio between the two was stable. The National Heart, Lung, and Blood Institute was by far the dominant institute funding cardiovascular research, but growth from the National Institute of Biomedical Imaging and Bioengineering was unexpectedly strong, suggesting a growing federal interest in cardiac imaging.<sup>3</sup>

Another important source of research support comes from industry, with a substantial amount being used to conduct clinical trials. Despite the US strength in large clinical trials, the NIH was less involved in sponsoring this type of research. While 28% of overall US cardiovascular articles were NIH-funded, only 20.3% of clinical trials and 12.2% of multicenter trials received NIH sponsorship.<sup>3</sup> The prohibitive cost of these trials may have left this task to parties with the wealth and incentive to support them, namely industry. In the general biomedical literature, industrial support is twice that of the NIH.<sup>4</sup> Large clinical trials most directly and immediately impact clinical practice. Significant industry financing can improve and accelerate existing research and support ideas that might not otherwise be funded. On the other hand, conflicts of interest and bias are important considerations when the sponsoring party has a financial interest in the research results.<sup>5,6</sup>

The current situation also reflects the fragmented allocation and complicated decision-making processes where scientists are not major participants in the process. The creation of the Alliance for Biomedical Research, which includes 4 of the largest scientific societies in Europe—the European Association for the Study of Diabetes, European Cancer Organization, European Respiratory Society, and European Society of Cardiology—is an important step forward in promoting the close involvement of the scientific community in the policymaking process.<sup>1</sup>

Considering the above mentioned, it is clear that the added value of the scientific societies in supporting and promoting biomedical research is of paramount (if not vital) importance, particularly in those countries that traditionally have more

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difficulties in getting access to more centralized grants. This is why the study that was published in *Revista Española de Cardiología*<sup>7</sup> is very important. In this study, Aleixandre Benavent et al. assessed the impact of the grants provided by the Spanish Society of Cardiology in the 2000–2006 award period. The methodology consisted in identifying and quantifying the publications that resulted from these grants. The overall conclusion is that 60% of the grants led to publications, and in 91% of the cases in national or international journals with an impact factor. One of the main advantages of this study is to provide objective data on how the money given to researchers translates into publications (one of the measurements that can objectively assess how science is being produced). It is quite relevant to observe that only a few studies with similar purposes have been done and even those used different methodologies and different approaches. The results from the present study, though positive, still show that a substantial part of the supported research programs never sees the light of day in the form of a scientific publication. Overall these results are consistent and similar to what has been described by other studies that have done similar analysis.

It is clear that scientific societies promote research in different ways, including awarding research grants. In Europe as a whole, there are European sources of research grants, mostly through the Framework Programmes or the European Research Council. At the national level there are also public grants, usually provided by governmental bodies (such as the *Fondo de Investigacion Sanitaria* in Spain), and those provided by scientific societies (such as the Spanish Society of Cardiology). During the studied period (2000–2006) an average of €470 000 was awarded by the Spanish Society of Cardiology in comparison with an average of €3.2 million granted by the Spanish government. There is an obvious need to assess the relevance and the impact of spending money to support research, and one of the surrogates is certainly the scientific output quantified in the number of scientific articles published in high-ranking journals. In other countries this has been done using a variety of parameters; for example, in a speech given at the 2006 American Heart Association national meeting, Dr. Elias A. Zerhouni, Director of the NIH at that time, emphasized the tremendous benefit derived from prior government funding of clinical research.<sup>3</sup> Using coronary artery disease as an example, NIH-funded research has prevented one million early deaths at a cost of \$3.70 per American per year. Despite these proven benefits, the likelihood of an investigator obtaining NIH research funding dropped by a third from 2003 to 2006.<sup>8</sup> From 2003 to 2008, NIH budgets stagnated, and even declined in terms of actual purchasing power.<sup>9,10</sup>

As mentioned in a recent document produced by a group of European researchers: “Translational research in the cardiovascular field must be seen as a re-iterative process among basic,

experimental, and clinical research, in partnership with industry. There is a strong need of support for clinical investigator-driven research, not as a stand-alone entity but as a component of this re-iterative process, including basic experimental research.”<sup>11</sup> It is obvious that several levels of support are needed in order to promote a consistent and robust research strategy as defined. The existence of transnational networks supported by large grants is essential to develop science at a large scale. On the other hand, there is also a need to support the development of smaller research projects, less ambitious but equally important to build up national projects and also improve the knowledge about local realities that is otherwise impossible to obtain. It is clear that national scientific societies have an important and unique role to play in sponsoring this type of research. There is an essential need to monitor and assess how this support translates into results so the societies can have a better understanding of the return on investment. Studies like the one published in this issue represent an important contribution to fulfill these goals and should be regularly done under the supervision of national (or international) societies.

## CONFLICTS OF INTEREST

None declared.

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