

Special article

# Evolution and Scientific Impact of Research Grants From the Spanish Society of Cardiology and Spanish Heart Foundation (2000–2006)

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ABSTRACT

**Introduction and objectives:** The *Sociedad Española de Cardiología* (Spanish Society of Cardiology) every year awards grants to finance research in the field of cardiovascular diseases. The aim of this study is to identify the impact of these investments during the period 2000–2006 from the subsequently published articles in scientific journals.

**Methods:** Using the identifying data of each project as search terms, all articles that resulted from these grants were located in the Spanish *Índice Médico Español* and *Índice Bibliográfico Español en Ciencias de la Salud* databases, and in Science Citation Index-Expanded and Scopus. Descriptive statistical analysis of these articles included type of grant, number and amount awarded per year, and the recipient's sex and institutional affiliation.

**Results:** The *Sociedad Española de Cardiología* awarded €3 270 877 to 207 recipients, an average annual total of €467 268. We identified 231 publications that resulted from 123 (59.42%) of these grants. The average number of articles per grant awarded was 1.12, and 1.9 when taking into account only the awards that led to publication.

**Conclusions:** During the period 2000 to 2006, the *Sociedad Española de Cardiología*/Fundación Española del Corazón (Spanish Heart Foundation) provided about €500 000 per year to fund research grants, thereby contributing to the fight against cardiovascular diseases. Almost 60% of grants have led to publications, 73% of which were published in international journals, and 91.34% in national or international journals with an impact factor in the Journal Citation Reports.

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## Evolución y repercusión científica de las becas de investigación de la Sociedad Española de Cardiología y la Fundación Española del Corazón (2000–2006)

RESUMEN

**Introducción y objetivos:** La Sociedad Española de Cardiología convoca anualmente becas para financiar proyectos de investigación en el campo de las enfermedades cardiovasculares. Nuestro objetivo es identificar la repercusión de estas inversiones durante el periodo 2000–2006 a partir de los artículos derivados de las becas y publicados en revistas científicas.

**Métodos:** Utilizando los datos de identificación de cada proyecto como términos de búsqueda, se recuperaron todos los artículos derivados de estas becas en las bases de datos del *Índice Médico Español*, el *Índice Bibliográfico Español en Ciencias de la Salud*, el *Science Citation Index-Expanded* y *Scopus*. Los artículos se sometieron a un análisis estadístico descriptivo en relación con la tipología de las becas, la evolución anual de su número y de su importe, el sexo y las instituciones de los becados.

**Resultados:** Se concedieron 207 becas con un importe total de 3.270.877 € y una dotación media anual de 467.268 €. De ellas, 123 (59,42%) aportaron publicaciones derivadas. El promedio de artículos publicados por beca concedida ha sido de 1,12, y de 1,9 si se tiene en cuenta únicamente las becas que dieron lugar a publicaciones.

**Conclusiones:** Durante el periodo 2000–2006, la Sociedad Española de Cardiología/Fundación Española del Corazón destinó casi 500.000 € anuales a financiar becas de investigación y así contribuir a luchar

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contra las enfermedades cardiovasculares. Casi el 60% de las becas han aportado publicaciones derivadas, 231 artículos. El 73% de los artículos se publicaron en revistas extranjeras y el 91,34%, en revistas españolas o extranjeras con factor de impacto en el *Journal Citation Reports*.

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### Abbreviation

SEC/FEC: *Sociedad Española de Cardiología* (Spanish Society of Cardiology)/*Fundación Española del Corazón* (Spanish Heart Foundation)

## INTRODUCTION

Cardiovascular diseases are the main cause of morbidity and mortality in the European Union, the United States and the most developed countries in the world and they are responsible for about 30% of deaths in the world. According to the World Health Organization (WHO), 17 million people die every year from cardiovascular diseases.<sup>1</sup> The health care costs from cardiovascular diseases are estimated at €296 billion in the United States and €169 billion in the European Union.<sup>2</sup> However, efforts taken to treat and control cardiovascular diseases and the funding allocated to research in this field are not considered to be sufficient today.<sup>2–5</sup>

The official research funding bodies may come from different areas (regional, national or supranational) but these do not always cover research in all the health areas considered important by the scientific associations. The role that these bodies play in the funding of certain diseases is very important as they can help to finance some of the gaps that exist in the research subsidized by public bodies. This is the case of entities such as the British Heart Foundation,<sup>6</sup> the National Heart, Lung, and Blood Institute in the United States,<sup>7</sup> the Netherlands Heart Foundation,<sup>8</sup> the Danish Heart Foundation,<sup>9</sup> and the National Heart Foundation of Australia,<sup>10</sup> among others.

In Spain, the Spanish Society of Cardiology (*Sociedad Española de Cardiología* [SEC]) every year finances experimental and clinical research projects through its yearly call for applications for Grants, Awards, and Financial Assistance. The investment is financed from the overall budget of the *Casa del Corazón* Foundation made up of the SEC and Spanish Heart Foundation (*Fundación Española del Corazón* [FEC]), and also funded by SEC departments and working groups and by contributions from industries, foundations, and businesses that collaborate with the Foundation. A sign of this growing interest is the fact that the number of awards increased from 15 in 2001 to 39 in 2004.

In accordance with current scientific practice, research projects must be published in a medium with a sufficiently large audience.<sup>11</sup> This has become clearly institutionalized and is accomplished through the scientific journals, meaning that an article must appear in a journal with a sufficiently large readership as reflected in databases of the relevant literature for it to be considered valid by the international community.<sup>12</sup> The scientific impact of the investment made by the SEC/FEC in grants for cardiovascular research is unknown, as the resulting publications and their influence on the scientific community (as reflected in citations and impact) has not been analyzed. The aim of this study was to analyze the evolution of the awards made by the SEC/FEC from 2000 to 2006, as well as identifying and describing their impact based on the articles published in scientific journals as a result of these research grants in cardiology.

## METHODS

### Selecting the Databases

We searched for the articles resulting from the grants and funded projects in 5 Spanish and international databases of scientific literature: *Índice Médico Español (IME)* from the *Consejo Superior de Investigaciones Científicas* (Spanish National Research Council), *Índice Bibliográfico Español en Ciencias de la Salud (IBECS)* from the *Instituto de Salud Carlos III* (Carlos III Health Institute), Science Citation Index-Expanded (through Thomson Reuters's Web of Science) and Scopus, which includes all of the Medline journals.

The study covered a 7-year period (2000–2006). We decided to use 2006 as the end date to allow time for relevant articles to be published and circulate in the literature databases. The study included all research articles in the strictest sense (original articles, letters to the editor, editorials, and review articles).

### Search Strategy to Locate Articles Resulting From the Grants Awarded

We followed a search methodology similar to that employed by other authors.<sup>13–15</sup> The aim was to ensure data accuracy by combining various search criteria: surname(s) of the lead researcher, researcher's institution, and keywords of the project title, including synonyms and acronyms. The identifying information on each project (lead researcher and institution, project title, type of grant, amount, and year of award) was provided by the SEC. A medical doctor specialized in medical documentation and a doctoral researcher specialized in documentation performed the searches.

The first phase consisted of collecting and selecting all the articles found in the searches where the project title and article title matched exactly or almost exactly, as long as these articles had been published in the year of the grant award or later. In case of a partial match, a cardiologist looked at and reviewed each article to determine its relevance to the original project.

The second phase involved sending an e-mail to all those who had received a grant to confirm the results obtained. The message asked them to send any publications that they believed had resulted from their grants. Only 30% of those who participated in the projects replied to this e-mail. Although we do not know why this figure was so low, it is probably due to several reasons: lack of interest; oversight or uncertainty, as the project had been awarded long ago; or lack of publication, interpreted as meaning that it was not necessary to reply. The articles received that were different from those selected during the initial literature search were included in the study after a quick review and selection process to make sure that they actually resulted from grants awarded by the SEC/FEC.

Of the 231 articles recovered, 189 (81.81%) were obtained by searching the databases, while 42 (19.19%) came from the authors' replies. It must be mentioned that these replies identified only 9 new authors for whom the search strategy had not returned a single document. The other replies increased the number of articles from authors that had already been identified.

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