LOCAL, DOMESTIC AND INTERNATIONAL SCIENTIFIC COLLABORATION IN BIOMEDICAL RESEARCH

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Collaboration practices and partners vary greatly per scientific area and discipline and influence the scientific performance. Bibliometric indicators are used to analyse international, domestic and local collaboration in publications of Spanish authors in three Biomedical subfields: Neurosciences, Gastroenterology and Cardiovascular System as covered by the SCI database. Team size, visibility and basic-applied level of research were analysed according to collaboration scope. International collaboration was linked to higher visibility documents. Cluster analysis of the most productive authors and centres provides a description of collaboration habits and actors in the three subfields. A positive correlation was found between productivity and international and domestic collaboration at the author level.

Introduction

Scientific cooperation seems to be an inherent characteristic of the evolution of Science. Many reasons have been argued to explain this phenomenon: from budgetary reasons (i.e. Big Science) to private ones (i.e. friendship). The results of cooperation may well become the focus of international attention (USA/Soviet satellite ventures) or hardly be noted. The fact remains that nowadays international cooperation is fostered not only by international superstructures, as is the case of the EU, but also by national organizations. In Spain, cooperation is induced by financing primarily and foremost those projects backed up by several scientists and institutes, to such an extent that one could speak of a "forced cooperation". Data from international or national cooperation is of a growing interest for policy makers, and numerous studies have been devoted to analyse scientific collaboration.1-4

We have worked on this topic from a bibliometric point of view, with data from our studies on the Spanish scientific system for the last ten years. During this decade, the Spanish scientists have increased their presence in the international scene, as recorded in the Science Citation Index (SCI) database, and their collaborative activity
showed a growing trend, increasing both national and international links, as measured by the higher number of papers with several addresses. It seems that the impulse towards cooperation, strongly pursued by the science policy measures, did work. Scientists from different institutions are joining together to request economic support. The key issue now is to analyse the collaboration patterns of these bigger teams and their influence on the research results.

From our previous studies dealing with the analysis of the Spanish production, both at the national level or in specific subfields, Pharmacology, Astronomy and Physics of Condensed Matter, we obtained the following results:

- a trend towards higher international and domestic collaboration was observed over time, together with big differences between areas.
- scientific production from international cooperation in Spain obtains higher visibility than that from national cooperation. Statistically significant differences were found in the expected impact factors.
- documents signed by several national institutions did not obtain higher visibility than single-institution documents.

The present paper aims at performing an in-depth study of the influence of collaboration on the scientific performance, focusing the analysis on the biomedical area, as far as bibliometric indicators can shed some light on the following questions: Is there a subgroup of scientists responsible for most of the internationally coauthored documents or do all scientists contribute in some extent to international science? Which is the relationship between productivity and collaboration? Are the most productive scientists those who collaborate with foreign partners? Are there differences between subfields?

Methodology

The scientific production of Spain during 1990-93, as covered by the Science Citation Index (SCI) and Social Science Citation Index (SSCI) databases, CD-ROM edition, was studied. Three biomedical subfields, according to the ISI classification of journals, were chosen for studying the role of scientific collaboration: Neurosciences, Gastroenterology and Cardiovascular System. Only journal articles were considered.

Collaboration was classified on an institutional basis as: international (at least one foreign address), domestic (between several centres or between different departments from a given centre, several Spanish addresses) or local (inside a department, with a single corporate address). Those documents containing several Spanish addresses and also a foreign one were classified as international collaboration as the influence of the foreign partner was considered more relevant.