

EDITORIAL

[Translated article] Open Science. Business or Opportunity?

La ciencia abierta. ¿Negocio u oportunidad?



It can be said that research has been conducted when the results of studies are published in journals indexed in prestigious scientific databases, when funding is obtained through competitive calls for proposals, or when innovative patents are registered following a research, development, and innovation (R+D+I) project and put out to tender for industrial services.

Since the late Middle Ages, with the introduction of the printing press, access to knowledge no longer required people to travel,¹ although documents did need to travel. But we are living in a new era.² The introduction of the Internet has brought about a fundamental change in the distribution of knowledge; the speed at which documents and images travel allows us to access them in real time; and this has meant not only a technical advance, but a new paradigm in scientific production and its distribution, with legal, economic, and social implications.²

In addition to English becoming the lingua franca for the transmission of knowledge, culminating in globalisation,³ medical journals have achieved economies of scale and can now be consulted by as many people as desired at the same time at a much lower cost.

However, this has not meant a reduction in fees for users of journals, but rather a new volume of business associated with researchers' historic need to have their scientific articles read by as many people as possible, and also to be cited by other researchers in their publications if they want to progress in their professional careers.⁴ Now, not only readers but also authors are paying to have their research published in open access digital journals. As a result, Spanish universities and the Spanish National Research Council paid more than €110 million to Elsevier, Wiley, and Springer Nature between 2021 and 2022.⁵

Open science has become a business in the hands of an oligopoly made up of a few publishers. Researchers provide the content of the journals for free and their institutions foot the bill. As if that were not enough, reviewers and editors also do their bit for the love of science. Furthermore, scien-

tific society journals, as charging for publication depends on the society itself and not on the publisher, are billed more if they are open access than if they are in paper format when the costs are much lower. To make matters worse, there are 'predatory' journals which, for a fee, publish articles without any editorial rigour and in a very short time,⁶ perverting the scientific chain.

Over the last 20 years, however, there has been a growing realisation that knowledge belongs to the human species and that advances presented as scientific publications should therefore be freely accessible, especially when public institutions fund the research and pay the researchers.

In Spain, a signatory to the San Francisco Declaration⁷ and the commitment to open science with the Hong Kong Principles,⁸ for free access to researchers' publications, both the Law on Science, Technology and Innovation,⁹ the Organic Law of the University System,¹⁰ and the criteria of the National Agency for Quality Assessment and Accreditation (ANECA) for the evaluation of university professors and researchers in general¹¹ make a firm commitment to free and open science, declaring that scientific knowledge will be considered a public good with open access.

To this end, they oblige teaching and research staff to deposit a copy of the final version of the work accepted for publication ('pre-print') and the associated data in open access institutional or thematic repositories, which must follow the FAIR principles (data that is Findable, Accessible, Interoperable, and Reusable), at the same time as the publication date, without prejudice to their deposit in other repositories. The Organic Law of the University System (LOSU) even provides for additional funding depending on the fulfilment of strategic objectives, including these open science and citizen science programmes.¹⁰

Institutional repositories are indexed in 'RECOLECTA'¹² (Open Science Collector), which brings together all Spanish digital infrastructures in which open access research results are published or deposited.

<https://doi.org/10.1016/j.recot.2025.03.011>

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ANECA attaches particular importance to publication in open access journals and platforms that do not charge authors or readers any fees ("diamond open access" model), as well as platforms for the publication of research results such as Open Research Europe or others promoted by different funding agencies. ANECA warns that publication in open access journals, whether commercial (*gold*) or free of charge (*diamond*), or in hybrid journals, does not under any circumstances exempt the deposit of publications in a repository.¹¹

Together with the prioritisation of open science, the defence of multilingualism with the Helsinki Declaration,¹³ bibliodiversity, disciplinary diversity, and inclusivity included in the Paris Call on Research Assessment Paris Call on Research Assessment¹⁴ the *Revista Española de Cirugía Ortopédica y Traumatología* (RECOT) has been placed in a privileged position as a destination for scientific articles. RECOT publishes open access studies in Spanish and English, it is not incompatible with the deposit of "pre-prints" in a repository, it does not charge publication fees and, given that, after years of discussion in the scientific community, the impact factor (IF) will not be what evaluates the quality of an article in the near future,^{10,11,15,16,17,18,19,20,21,22} the struggle for the IF should not be a priority for journals or researchers. Every Spanish university has a free repository where they can upload Open Access works, as do the health services of most of the autonomous communities. The leap forward for Spanish orthopaedics may be unimaginable.

Associate Editor of *Injury*

Ethical considerations

This article and its author have no ethical issues to declare.

Funding

No funding was received for drafting this article.

Conflict of interests

The author and his family have no conflict of interest to declare.

References

1. American Printing History Association. History of printing timeline. <https://printinghistory.org/timeline/>. Último acceso 18 de Marzo de 2025.
2. Guerado E. Scientific societies and the third industrial revolution. *Injury, Int. J. Care Injured*. 2017;48S6:S1–4, [http://dx.doi.org/10.1016/s0020-1383\(17\)30788-x](http://dx.doi.org/10.1016/s0020-1383(17)30788-x).
3. Globalization 101. The Levine Institute. The State University of New York <http://www.globalization101.org/what-is-globalization/>. Último acceso 6 de Marzo de 2025.
4. Angell M. Publish or Perish: A proposal. *Annals of Internal Medicine*. February 1986;104:261–2, <http://dx.doi.org/10.7326/0003-4819-104-2-261>.
5. Ansede M. Los científicos pagaron unos 1.000 millones de euros en cuatro años. *Diario El País*. 21 de noviembre de 2023. <https://elpais.com/ciencia/2023-11-21/los-cientificos-pagaron-unos-1000-millones-de-euros-en-cuatro-anos-a-las-grandes-editoriales-para-publicar-sus-estudios-en-abierto.html>. Último acceso 5 de marzo de 2025.
6. Combalá A. Revistas predatoras y estafadoras. *Rev Esp Cir Ortop Traumatol*. 2021;65:315–6, <http://dx.doi.org/10.1016/j.recot.2021.07.002>.
7. Declaración de San Francisco sobre la evaluación de la investigación (DORA). <https://sf-dora.org/read-the-declaration-espanol/>. Último acceso el 23 de febrero de 2025.
8. World Conference on Research Integrity. The Hong Kong Principles. <https://www.wcrif.org/guidance/hong-kong-principles>. Último acceso el 23 de febrero de 2025.
9. Jefatura del Estado. Ley 17/2022, de 5 de septiembre, por la que se modifica la Ley 14/2011, de 1 de junio, de la Ciencia, la Tecnología y la Innovación. «BOE» núm. de 06 de septiembre de 2022;214:2–66. <https://www.boe.es/buscar/pdf/2022/BOE-A-2022-14581-consolidado.pdf>. Último acceso 6 de Marzo de 2025.
10. Jefatura del Estado, Ley Orgánica 2/2023, de 22 de marzo de 2023, del Sistema Universitario. «BOE» núm. de 23 de marzo de 2023;70:43267–339. <https://www.boe.es/boe/dias/2023/03/23/pdfs/BOE-A-2023-7500.pdf>. Último acceso el 26 de febrero de 2025.
11. Agencia Nacional de Evaluación de la Calidad, Acreditación (ANECA). Baremo de aplicación en la evaluación de la actividad investigadora por los comités asesores. Diciembre de 2024. https://www.aneca.es/documents/20123/263604/BAREMO_091224.pdf. Último acceso el 26 de febrero de 2025.
12. Ministerio de Ciencia, Innovación y Tecnología. Fundación española de Ciencia y Tecnología (FECYT). RECOLECTA. <https://recolecta.fecyt.es>. Último acceso 7 de marzo de 2025.
13. Iniciativa Helsinki sobre Multilingüismo en la Comunicación Científica. Traducción al español. <https://www.helsinki-initiative.org/es>. Último acceso el 23 de febrero de 2025.
14. Paris Call on Research Assessment. <https://osec2022.eu/paris-call/>. Último acceso el 23 de febrero de 2025.
15. Consejo Superior de Investigaciones Científicas (CSIC). <https://www.csic.es/es/investigacion/coara>. Último acceso el 26 de febrero de 2025.
16. The Coalition for Advancing Research Assessment (CoARA). <https://coara.eu>. Último acceso 23 febrero de 2025.
17. Seglen Per O. Why the impact factor of journals should not be used for evaluating research. *BMJ*. 1997;314:498–502, <http://dx.doi.org/10.1136/bmj.314.7079.497>.
18. Nature, Not so deep impact. *Editorial Nature*. 2005;435:1003–4, <http://dx.doi.org/10.1038/4351003b>. <https://www.nature.com/articles/4351003b>
19. Vancly JK. Impact factor: outdated artefact or stepping-stone to journal certification? *Scientometrics*. 2012;92:211–38, <http://dx.doi.org/10.1007/s11192-011-0561-0>.
20. The, PLoS., Medicine Editors. The Impact Factor Game. *PLoS Med*. 2006;3:e291, <http://dx.doi.org/10.1371/journal.pmed.0030291>. <https://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.0030291&type=printable>.
21. Rossner M, van Epps H, Hill E. Irreproducible results: A response to Thomson Scientific. *J Cell Biol*. 2008;180:254–5, <http://dx.doi.org/10.1083/jcb.200801036>. <https://pmc.ncbi.nlm.nih.gov/articles/PMC2271027/pdf/jem2050260.pdf>.
22. Nature, The citation black market: schemes selling fake references alarm scientists. The ways in which researchers can artificially inflate their reference counts are growing. 20 August 2024, <http://dx.doi.org/10.1038/d41586-024-01672-7>. <https://www.nature.com/articles/d41586-024-01672-7>.

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