Alternative types of academic publications

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Introduction

Currently, the paradigm of scientific publication involves primarily the model of peer-reviewed publications. Dominated by a few companies and institutions, this model is based on scientific journals that publish in print, on the Internet, or both, works that go through a laborious selection of quality. Initially, an editorial board evaluates the overall quality of submissions, their suitability to the journal editorial line, its apparent scientific soundness, the general design and interest to the audience of the journal. After this highly subjective filter, the unpublished manuscripts are still sent to technical reviewers, usually people with deep knowledge about the area of the submission. At least two of these reviewers are commissioned by the editors. If both accept the task and approve the manuscript, it is submitted for publication.

The traditional academic publishing model is based on readers' journals, institutions (universities, governments, companies) and libraries that acquire paid signatures. It is an organized and highly profitable industry, as well as an effective oligopoly (1), in which the top five publishing groups control 50% of all publications and have a combined $ 10 billion in profit (1). This was not always a giant business, though. Academic journals are the main channel of scientific dissemination since the 19th century. Until World War II, however, they were mainly published by scientific societies. Only after that did the private academic publishing industry consolidate. Currently, most of the former publishers and journals of scientific societies have been acquired by private companies (1).

Several authors have pointed out that the academic *corpus* represented by scientific publications is dominated by a group of western countries, and this *corpus* is commonly referred to as ***mainstream science***, whereas, in contrast, the rest of the academic world represents ***peripheral science***. This arbitrary division can be roughly compared with the economic classification often identified as *dependency theory* that divides the world into ***central (core)*** and ***peripheral countries***. Thus, the current academic editorial model largely reflects the geographical division between *developed* and *underdeveloped* countries, using the World Bank criterion (2,3). This practice does not remain at this level only, down to a layer of institutions of **excellence** and up to the level of individual researchers, and serves as a positive feedback mechanism to maintain

hegemony in the academic world (4). Briefly, *elite researchers* in *leading institutions* publish in the *most renowned journals*. The order can be modified randomly: the *most renowned journals* are those where *elite researchers* from *leading institutions* are published. It is a self-referenced, closed self-centered model. Popularly, scientists refer to this rank of journals, institutions and researchers as *first tier*, *second tier* and even *third tier*, terms closely related to economic power (5), but used imprecisely.

Problems in paradise.

A number of problems afflict the peer reviewed publishing model. The bias imposed by the initial editorial evaluation is pretty obvious, but largely overlooked in discussions on the subject. The editors of a journal, as a rule, print its brand on the editorial line of the journal, often remarkably, however, not always impartially. It's really hard to imagine that in a scenario where there are thousands of scientific journals disputing among themselves a big market impartiality can be maintained systematically. The bias in scientific publications has a name: **publication bias** (5). It is often invoked when researchers from less important or peripheral centers can not reach the mainstream of academic publications almost exclusively based in developed countries. However, more subtle forms of "publication bias" are even more common, though less visible. Negative results, for example, rarely reach the top journals, as opposed to "revealing findings." The systematic failure to publish negative results seem to affect significantly, for example, the health sciences. Clinical studies showing results are easier to publish than those showing no effect of any treatment (7). Although such a complex phenomenon as publication bias is necessarily multifactorial and involves much more than the scientific journal editors, the latter are part of the "subjectivity" of peer-reviewed publications.

Another problem often pointed out is the lack of transparency in peer reviews. Usually, reviewers of scientific publications provide an *ad hoc* service and are not part of a body of consultant advisers. Moreover, their identities are usually unknown. There is, therefore, little guarantee that the chosen reviewers represent the field of the evaluated manuscript, let alone are well versed in that specific area of study. Furthermore, the peer review system is built to assess methodologically and scientifically the content of manuscripts, but not to detect fraud or misconduct. There are doubts and suspicions about the objectivity and honesty of each party involved in this process, both from the point of view of authors, and reviewers. Several proposals have been forwarded to try to remedy this problem (8).

The peer review model is economically dominated by publishers and journals that charge subscriptions and receive funding from government agencies and scientific societies (9). Almost all of the most important scientific journals are in developed countries and are published exclusively in English, also pointed out as a source of bias, affecting what and how they will publish. Publications in

non-english national languages, even if they are among the most spoken in the world, are little read even in their countries of origin, in contrast to scientific publications in English. Although it makes sense for better international communication that there is a universal language, it imposes a necessary obstacle to scientists whose native language is not English (4).

Open access

A recent alternative to the classical model of scientific publication by subscription is the **open access** model in which the publications are available for free on the Internet to be accessed and the cost of publishing is charged from authors or institutions. Scientific publication in Portuguese in Brazil, for example, is dominated by Scielo, a repository of open access scientific publications, funded by Brazilian government agencies. The open access model has received constant criticism of interference in the objectivity of the review process because the authors and institutions pay for research publications. Recent attacks disclosed the fragility of the peer review process in the open access model (10). However, it is the fastest growing academic publishing model and all major academic publishing groups today have their open access section.

The peer review and publication policies in open access journals are essentially the same as in traditional journals. As in the traditional model, the quality of reviews is commonly criticized, and anecdotal examples of errors exist innumerable (11). The proliferation of open access publishing houses and journals that publish exclusively on electronic media (which considerably increases publication speed and capacity) is also seen as a factor of overload in the peer review system, already weakened by criticism and difficulty in finding reviewers (11). In this way, open access has an image associated with a somewhat more fragile, perhaps insufficient, peer review. Objectively, there is no proof of this kind of idea, mainly because the revisions occur privately and there is no way to quantify or qualify them, much less how to compare the traditional model with open access.

From the geographical point of view, the open access journals have the reverse situation from the traditional model. Most publications on open access come from countries and institutions considered *peripheral*, outside the *core* or *mainstream science*. One apparently paradoxical but important detail is that researchers from *peripheral* countries (by World Bank criteria) with lower *per capita* income are equally likely to pay for open access publications than mainstream researchers, who are often research funded (2). This is seen by some as indicating the greater permissiveness of the open access publishing system. In fact, a comparison showed that the open access journal *PLOS One* accepted 70% of the submissions in 2011, while the hybrid journal (conventional publication alongside to open access) *Physical Review Letters* published less than 35% in the same period and the traditional journal *Nature* published only 8% (12).

A frequent criticism of the open access model is in relation to the amounts

charged by authors or institutions for the publication of articles. Prices range from US$399 (per author) in the PeerJ paper to US$5,000 (per article) in the journal Cell Reports. In 2011, the academic publishing industry generated US$9.4 billion and published 1.8 million articles in English, at an average cost of US$5000 per article. According to analyzes, discounting the profit margin, the individual cost per article for publishing houses would be around $ 2700. For critics, this figure is artificially inflated and the cost, in fact, may be much lower. That would explain why a company like PeerJ can charge ten times less than others. On the other hand, experts in scientific publishing believe that PeerJ will not be able to maintain a self-sustaining and not much less lucrative business (13).

Enter the Green Way

Alternatives that do not involve financial dilemmas or barriers to science communication have been proposed. A set of disparate publication arrangements can be grouped on the label **green open access**, where publications are available free to the public on the Internet, but publishing costs are diluted because there is no journal vehicle, replaced by repositories where the authors themselves "publish" or deposit their work (self-archiving). These manuscripts (or other forms of academic work) are not peer-reviewed, nor pass the evaluation of an editorial board. Such repositories are mostly based in universities, although there are hybrid models where a company provides both open access services paid by the authors (also called **golden open access**) as well as a self-archiving repository. A number of different academic publishing types have emerged, with greater or lesser participation of mediators such as educational institutions, government and business. A popular scholarly publishing portal has as its motto: "credit all your research" and accepts submissions of any kind of academic material. Some internet services perform a general assessment to determine the quality of the material posted. Some services only publish the material after this evaluation. Other publish immediately any material deposited and only after perform an evaluation. This review differs from the editorial analysis of a scientific journal, being performed only to ensure the academic nature of the deposited material.

The recent proliferation of several different channels that allow the publication of academic materials not conventionally included in peer-reviewed publications shows the strength of the phenomenon. Collectively, these channels are part of the *Open Science* movement, which seeks to *democratize* access to academic information, reducing barriers to the free dissemination of ideas and research results (14). *Open Science* can be seen as part of a broader political-academic trend, sometimes called *Open Philosophy*, which involves an innovative way of knowing and also a way of interpreting this new way of knowing 14). Yet an evolving term, the *Open Science*, has its roots in the movements of *free software* and *open source* of Computer Sciences and relies heavily on recent advances in the internet and the media. It is considered a *disruptive* innovation in the sense

that it tends to change definitively the way we do and disseminate science. The *Green Open Access* road has the potential, unlike the most widespread models today, to truly democratize access to information and subvert the *core-periphery* dichotomy that is at the heart of the academic world nowadays.

In the following sections, I will list several different forms of publication of academic material outside the traditional model and also outside of the *Golden way* of open access.

Green open access publications

This listing brings a non-exhaustive set of alternative academic publication formats, with examples from my own material, deposited in multiple channels. There are more and more ways and means of scientific dissemination, and this *e-manuscript* (which is already in its fourth version) will continue to be updated periodically.

Conference posters deposited in repositories:

Magalhaes R, Felix J, Albuquerque J et al. Evaluation of the analgesic effect of venlafaxine, a serotonin and noradrenaline reuptake inhibitor [v1; not peer reviewed]. F1000Research 2015, 4:1259 (poster) doi:10.7490/f1000research.1110985.1

Fontenele J, Freire P, Santos K et al. Focal brainstem tumors: report of patients treated in a brazilian pediatric oncological center [v1; not peer reviewed]. F1000Research 2015, 4:1363 (poster) (Portuguese) doi:10.7490/f1000research.1111076.1

Felix F, Santos K, Freire P et al. Diffuse intrinsic pontine gliomas: report of patients treated in a brazilian pediatric oncological center [v1; not peer reviewed]. F1000Research 2015, 4:1362 (poster) (Portuguese) doi:10.7490/f1000research.1111075.1

Santos K, Lima R, Bastos MV et al. Retrospective evaluation of patients with recurrent brain tumors treated with vinblastine or temozolomide at the Albert Sabin Children's Hospital between 2007-2012 [v1; not peer reviewed]. F1000Research 2015, 4:1256 (poster) (Portuguese) doi:10.7490/f1000research.1110982.1

Felix F, Feitosa M, Bezerra MdC et al. Undifferentiated intracardiac tumor [v1; not peer reviewed]. F1000Research 2015, 4:1358 (poster) (Portuguese) doi:f1000research.1111073.1

Felix F, Freire P, Santos K and Fontenele J. Predictors of survival in children with ependymoma from a single center: using random survival forests [v1; not peer reviewed]. F1000Research 2015, 4:1209 (poster) doi:10.7490/f1000research.1110937.1

Felix F, Mattos JP, Hirth C and Fontenele J. Everolimus for patients with tumors associated with tuberous sclerosis and neurofibromatosis [v1; not peer reviewed]. F1000Research 2015, 4:1357 (poster) (Portuguese) doi:10.7490/f1000research.1111072.1

Alves N, Aquino R, Veras I and Felix F. A case of medulloblastoma with late neurologic deterioration [v1; not peer reviewed]. F1000Research 2015, 4:1343 (poster) (Portuguese) doi:10.7490/f1000research.1111060.1

Felix F, Veras I, Nogueira C and Juvenia F. Nimotuzumab in a case of recurrent glioblastoma expressing a new EGFR mutation [v1; not peer reviewed]. F1000Research 2015, 4:1303 (poster) (Portuguese) doi:10.7490/f1000research.1111020.1

Felix F, Veras I, Bacalhau AF and Fontenele J. Nimotuzumab in patients with progressive diffuse intrinsic pontine glioma [v1; not peer reviewed]. F1000Research 2015, 4:1302 (poster) doi:10.7490/f1000research.1111019.1

Felix F and Fontenele J. Chemoradiotherapy with etoposide, cisplatin, and ifosfamide associated with valproic acid for patients with diffuse intrinsic pontine glioma [v1; not peer reviewed]. F1000Research 2015, 4:1301 (poster) (Portuguese) doi:10.7490/f1000research.1111018.1

Felix F, Araújo O, Trompieri N et al. Treatment of pediatric patients with recurrent brain tumors with vinblastine [v1; not peer reviewed]. F1000Research 2015, 4:1300 (poster) (Portuguese) doi:10.7490/f1000research.1111017.1

Felix F, Araújo O, Trompieri N et al. Treatment of pediatric patients with multiply recurrent brain tumors with temozolomide and valproic acid [v1; not peer reviewed]. F1000Research 2015, 4:1299 (poster) (Portuguese) doi:10.7490/f1000research.1111016.1

Barcelos P, Trindade V, Aguiar L et al. Ewing sarcoma in the skull of an infant: case report [v1; not peer reviewed]. F1000Research 2015, 4:1258 (poster) (Portuguese) doi:10.7490/f1000research.1110984.1

Trindade V, Barcelos P, Aguiar L et al. Intramedullary granulocytic sarcoma [v1; not peer reviewed]. F1000Research 2015, 4:1257 (poster) (Portuguese) doi:10.7490/f1000research.1110983.1

Freire P, Felix F, Santos K et al. Descriptive longitudinal study of pediatric patients with primary brain tumors: establishment of a hospital registry [v1; not peer reviewed]. F1000Research 2015, 4:1370 (poster) (Portuguese) doi:10.7490/f1000research.1111083.1

Felix F, Azevedo JR, Feitosa M et al. Childhood pleuropulmonary blastoma [v1; not peer reviewed]. F1000Research 2015, 4:1304 (poster) (Portuguese) doi:10.7490/f1000research.1111021.1

Felix F, Albuquerque J and Fontenele J. Subependymal Giant Cell Astrocytoma with good response to oral everolimus – a case report [v1; not peer reviewed]. F1000Research 2015, 4:1233 (poster) (Portuguese) doi:10.7490/f1000research.1110960.1

Felix F, Albuquerque J and Fontenele J. Survival analysis of pediatric patients with brain tumors using a machine learning method: decision tree analysis by recursive partitioning [v1; not peer reviewed]. F1000Research 2015, 4:1223 (poster) (Portuguese) doi:10.7490/f1000research.1110950.1

Felix F, Veras I, Nogueira C et al. Seizure prophylaxis with valproic acid in pediatric patients with brain tumors [v1; not peer reviewed]. F1000Research 2015, 4:1210 (poster) doi:10.7490/f1000research.1110938.1

Preprints:

Sales M, Figueiredo KS, Fontenele JB, Viana GS, Felix FH. (2015) Sibutramine antinociceptive effect in female rodents is not dependent on catecholaminergic signaling. PeerJ PrePrints 3:e1544v2 doi:10.7287/peerj.preprints.1544v2

Figueiredo KS, Sales ML, Fontenele JB, Viana GS, Felix FH. (2015) Valproate antinociceptive and anti-inflammatory effect in female rodents. PeerJ PrePrints 3:e1613v1 doi:10.7287/peerj.preprints.1613v1

Academic presentations (slides):

Felix F. Management of infantile hemangiomas [v1; not peer reviewed]. F1000Research 2015, 4:1231 (slides) (Portuguese) doi:10.7490/f1000research.1110958.1

Albuquerque J, Fontenele J and Felix F. Propranolol treatment for children with hemangiomas – final report [v1; not peer reviewed]. F1000Research 2015, 4:1232 (slides) (Portuguese) doi:10.7490/f1000research.1110959.1

Felix, Francisco (2015): Clinical treatment of malignant brain tumors in pediatric patients. figshare. doi:10.6084/m9.figshare.2007588.v1

Felix, Francisco (2015): Clinical treatment of low-grade gliomas in pediatric patients. figshare. doi:10.6084/m9.figshare.2007543.v1

Abstracts published in proceedings and deposited in repositories:

Felix, Francisco (2016): Wilms tumor with cardiac extension - case report. (Portuguese). figshare. doi:10.6084/m9.figshare.2059830.v1

Articles published in local academic journals and deposited in repositories:

Bonavides de Castro, Patrícia; Santos Bruno, Débora; Rodrigues Filho, Filadelfo; Felix, Francisco; Roberto Lavor Porto, Paulo; Odorico de Moraes Filho, Manoel (2016): Evaluation of the Interference of Cyclosporin in the

Development of Metastasis in a Low Malignant Murine Tumor (Portuguese). figshare. doi:10.6084/m9.figshare.2059851.v1

Felix, Francisco (2016): Treatment of hemangioma in pediatric patients. (Portuguese). figshare. 10.6084/m9.figshare.2059821.v1

Selfpublished replies to academic publications:

Felix, Francisco; Fontenele, Juvenia Bezerra (2016): Statin effect in fibromyalgia syndrome patients may not be easily predictable. figshare. doi:10.6084/m9.figshare.3179281.v1

Felix, Francisco; Fontenele, Juvenia Bezerra (2016): Side effects of propranolol used for the treatment of hemangiomas of infancy. figshare. doi:10.6084/m9.figshare.3175576.v1

Research projects approved by institutional review boards:

Felix, Francisco. (2016). Phase IIa (proof of concept) Trial of Valproic Acid with Chemotherapy and Radiotherapy for Patients with Diffuse Intrinsic Pontine Glioma in Childhood and Adolescence - VALQUIRIA. Zenodo. doi:10.5281/zenodo.44888

Felix, Francisco. (2016). Retrospective analysis of off-label treatment with beta-blockers in pediatric patients with hemangiomas diagnosed between January and December 2009 at Hospital Infantil Albert Sabin. Zenodo. doi:10.5281/zenodo.44890

Felix, Francisco. (2016). Longitudinal observational study of pediatric patients with primary brain tumors: establishment of a hospital-based registry. Zenodo. doi:10.5281/zenodo.44885

Felix, Francisco. (2016). Treatment assessment of pediatric brain tumor patients in Hospital Infantil Albert Sabin between 2007-2008 (amended to 2007-2010). Zenodo. doi:10.5281/zenodo.44253

Monographs of undergraduate students under my supervision (drafts):

Lima, Rayra A C et al.. (2016). Evaluation of adverse events of chemotherapy in patients with central nervous system tumors: a retrospective study - first major draft release. Zenodo. doi:10.5281/zenodo.45085

Manuscripts drafted in Authorea, integrated with Github and deposited in Zenodo:

Francisco H C Felix. (2016). Modelo de anteprojeto para relato de caso. Zenodo. doi:10.5281/zenodo.49874

Macros and scripts deposited in public repositories:

Francisco H C Felix. (2016). rapadura: ff macro para OOo. Zenodo. doi:10.5281/zenodo.46239

Pubmed Commons comments (post-publication review):

Felix, F. (2014). Comment on "The response and survival of children with recurrent diffuse intrinsic pontine glioma based on phase II study of antineoplastons A10 and AS2-1 in patients with brainstem glioma." By Burzynski et al. PubMed comment cm24718705_6838

Felix, F. (2014). Comment on "Inadvertent high-dose therapy with temozolomide in a child with recurrent pontine glioma followed by a rapid clinical response but deteriorated after substitution with low-dose therapy." By Wang et al. PubMed comment cm24732058_7147

Pre-publication review (refereeing):

Francisco H C Felix. (2013). Pre-publication review of "Gajjar, S., Mazloom, A., Chintagumpala, M., Mahajan, A., C. Paulino, A. 2014. Secondary Glioblastoma Multiform in a Patient with CHARGE Syndrome and Prior Radiation Therapy for Medulloblastoma. Pediatric Hematology-Oncology, 31: 366". Publons review 227398

Francisco H C Felix. (2011). Pre-publication review of "Madhumita, N., Suhas K., G., Rakesh K., M., Supratim, D., Krishnendu, M. Infection associated hemophagocytic syndrome in childhood tuberculosis: A case report. Journal of Pediatric Infectious Diseases, 5: 91". Publons review 234534

Francisco H C Felix. (2010). Pre-publication review of "H. Solomon, D. 2010. The Comparative Safety of Analgesics in Older Adults With Arthritis. Archives of Internal Medicine, 170: 1968". Publons review 227448

Francisco H C Felix. (2009). Pre-publication review of "Collins, P., Baudo, F., Huth-Kühne, A., Ingerslev, J., M Kessler, C., Castellano, M., Shima, M., St-Louis, J., Lévesque, H. 2010. Consensus recommendations for the diagnosis and treatment of acquired hemophilia A. BMC Research Notes, 3: 161". Publons review 227451

Francisco H C Felix. (2009). Pre-publication review of "R. Meacham, L., A. Sklar, C., Li, S., Liu, Q., Gimpel, N., Yasui, Y., A. Whitton, J., Stovall, M., L. Robison, L., C. Oeffinger, K. 2009. Diabetes Mellitus in Long-term Survivors of Childhood Cancer. Archives of Internal Medicine, 169: 1381". Publons review 227452

Francisco H C Felix. (2009). Pre-publication review of "L. Cox, C., M. Hudson, M., Mertens, A., Oeffinger, K., Whitton, J., Montgomery, M., L. Robison, L. 2009. Medical Screening Participation in the Childhood Cancer Survivor Study. Archives of Internal Medicine, 169: 454". Publons review 227467

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