The concept of BRIF (Bioresource research impact factor) as a tool to foster bioresource sharing in research: is it applicable to other domains?

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Introduction

Concept. Numerous health research funding institutions have recently expressed their strong will to promote data sharing. As underlined in a recent editorial in Nature Medicine, an operational approach is needed to achieve this goal. Bioresources such as biobanks, databases and bioinformatics tools are important elements in this landscape. Bioresources need to be easily accessible to facilitate advancement of research. Besides technical and ethical aspects, a major obstacle for sharing them is the absence of recognition of the effort behind establishing and maintaining such resources. The main objective of a Bioresource Research Impact Factor (BRIF) is to promote the sharing of bioresources by creating a link between their initiators/implementers and the impact of scientific research using them. A BRIF would make it possible to trace: 1. the quantitative use of a bioresource, 2. the kind of research utilising it, and 3. the efforts of people and institutions that construct and make it available.

An international working group (http://www.gen2phen.org/groups/brif-bio-resource-impact-factor). In the context of EU projects, a BRIF working group has been set up, including so far 105 participants. The work involves several steps: 1. creating a unique identifier; 2. standardising bioresource acknowledgment in papers; 3. cataloguing bioresource data access and sharing policies; 4. identifying other parameters to take into account; and 5. prototype testing, involving volunteer bioresources and the help of journal editors.

A workshop. The first BRIF workshop was held in Toulouse, France (17-18 January 2011), gathering 34 people from 10 countries, representing various domains: biobanks, genome databases, epidemiological longitudinal cohorts, bioinformatics, scientific publishing, bibliometry, health law and bioethics. The lack of objective measures of use of bioresources was recognised by all; we focused on shared aims, but underlined that each community had specific aspects to consider and resolve (http://precedings.nature.com/collections/brif-workshop-january-2011).

Main avenues explored and further steps

Identification. Bioresources need to be identified by a unique digital identifier (ID), ideally via existing mechanisms. Digital Object Identifiers (DOIs) may be interesting. Several issues must be

3. Cambon-Thomsen et al. The role of a bioresources impact factor as an incentive to share human bioresources. Nat genet 2011, in press
considered, including: what to identify (biobank, collection, database, dataset, subset); identifier requirements (persistent over time, globally-unique, citable); and which international and independent body should be responsible for assigning bioresource IDs. Working subgroups were created to address those questions. Attribution of credit to scientists for different kinds of work (in addition to publications) using researcher IDs was also discussed. The ORCID initiative (http://www.orcid.org ) is building a new contributor ID framework which should in principle enable credit to be given to both bioresources and individuals involved in their creation and maintenance.

Citation. Standardisation is necessary, but could be combined with existing referencing standards and conventions\(^6\), such as: citing marker papers, standardised sentences in Materials & Methods or acknowledgements section of papers, co-authorship when justified, and including resource name in paper title. Specific requirements for citing bioresources are lacking in the Uniform Requirements for Manuscripts submitted to Biomedical Journals and should be added. In order to enable automated tracking of bioresource use, the bioresource ID should ideally appear in or under the abstract section in order to be visible even without access to the full text of articles.

Factors to take into account in impact factor calculation. BRIF should not be a citation index only. Factors such as time and domain of bioresources need to be considered in the calculation process and its weighting. Although the BRIF scope could be extended to measure many different aspects of bioresource utilisation, including economic implications, it was decided to concentrate first on use and impact in research settings.

Access and sharing policies. They have been developed over years. However, the incentivisation of bioresources to promote access needs to be balanced with appropriate provisions compatible with their interests proper recognition of scientific contribution and sustainability supported by the capacity of measuring their own impact. There are actually no mechanisms in place to measure this impact. Empowering bioresources with tools such as BRIF is, therefore, urgent.

Perspectives. The full impact of bioresources is wider than BRIF, but BRIF is an essential operational step. The present proliferation of ideas, statements and proposals around data sharing from different perspectives and stakeholders favours the emergence of tools such as BRIF in order to make data sharing principles operational. In the same spirit it could be applied to the domain of language studies.