FACULTY OF 1000: A WAY OF IDENTIFYING WHAT ARE CURRENTLY CONSIDERED THE MOST INTERESTING RESEARCH ARTICLES IN BIOLOGY

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Faculty of 1000 is a new reviewing, evaluation and rating system of primary scientific papers in the area of biology, produced by Biology Reports Limited and published by BioMed Central Limited (www.biomedcentral.com). Both companies are part of The Current Science Group. The service will identify the current most interesting and most important research papers in biology, picked by a group of over 1000 leading international researchers from any journal, and provide reasons why these articles are the most interesting and important. The service is dynamic, updated every day, but it also keeps an archive of all listings, fully accessible and searchable for subscribers.

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Introduction

Scientific articles are typically published in any one of the thousands of journals that are published worldwide. Traditionally, the quality of primary scientific articles – the articles that report research results – has been judged by the journal in which they have been published. The journal provides, as it were, a 'label' for the article. Since Eugene Garfield at the Institute for Scientific Information devised the Impact Factor – a measure derived from the frequency and speed with which articles from a given journal are cited, relative to the number of articles published in that journal – the quality of these journals has, in turn, been judged by their Impact Factor.

If an article is accepted for publication in a certain journal, it immediately takes on the quality label of that journal, which is to all intents and purposes determined by its Impact Factor. Quality is, of course, a vague notion in this regard, but Impact Factor is very aptly named, really meaning 'noteworthiness'. The Impact Factor, for all its imperfections, has been and still is an immensely practical device to help sorting the phenomenal quantity of journals and scientific literature in general.

The Impact Factor arguably identifies the most noteworthy journals, but not necessarily the most noteworthy individual papers. Not every paper in a high impact journal is highly interesting, and, more to the point perhaps, not every highly interesting paper is published in a high impact journal. Searches do not normally result in finding only the significant or interesting, the 'million hit syndrome' being a familiar phenomenon for any scientist. Most researchers rely on personal communications from respected peers or teachers for identifying the category of significant papers. Unfortunately, for most

researchers this means that from time to time very important papers are missed, or are brought to their attention uncomfortably late to take into account for their own research.

Faculty of 1000

Faculty of 1000 (www.facultyof1000.com) – 'the next generation literature awareness tool for the life sciences' – emulates this system of peer communication that draws attention to very interesting papers but makes it a more systematic process, drastically reducing the chance of missing something important. If we were to sum up the common view amongst the many research scientists we talked to about the literature of published papers, it would be something like 'there's too much out there and it's often difficult to find what you want'. Biology Reports designed and built Faculty of 1000 in close consultation with these scientists, to help them solve this problem. Faculty of 1000 is an online research service that will comprehensively and systematically highlight and review the most interesting papers published in the biological sciences, based on the recommendations of a body of well over 1400 selected leading researchers, the 'faculty'. With recommendations from such a large group of leading, internationally renowned researchers, it will rapidly provide what could be described as a consensus map of the most interesting and important papers and trends across biology.

Faculty of 1000 was launched in a preview version on 9 November 2001. It is a service run by scientists for scientists, and will provide scientists with a continuously updated insider's guide to the most important papers within any given field of biological research. It highlights papers on the basis of their individual scientific merit rather than just on the perceived quality of the journal in which they appear. It will offer researchers not only recommendations from their peers, but also, due to its scale and comprehensiveness, a discipline-wide consensus of what is interesting and important. In doing so, it will be of invaluable assistance in organising and evaluating – in other words coping with – the mass of information available in the scientific literature.

How is the Faculty of 1000 organised and who is involved?

In the Faculty of 1000, the entire field of biology is divided into 16 subjects (or 'Faculties'), each of which will be led by two to four Heads of Faculty who were selected on the recommendation of large numbers of scientists. Each Faculty is subdivided into three to twelve sections, each led by two or three Section Heads (selected by the Heads of Faculty) and comprising, generally, between 10 and 50 Faculty Members (selected by the Section Heads). Currently, there are approximately 1400 Faculty Members, divided into 73 sections representing specific research areas and grouped into 16 Faculties. It is envisaged that Faculties in Ecology, Pharmacology and Physiology will be added soon. Faculty of 1000 consists of some of the best scientists in their respective fields and involves both experienced and younger investigators. A full list of Faculty Members is available on the F1000 web site.

What journals and types of article will be covered by the service?

Any paper that a faculty member selects will be featured, regardless of the journal in which it is published. The only restrictions are that Faculty members cannot pick papers on which they are an author and that the articles they select must be primary research papers (not reviews, commentaries, etc.).

The Evaluation System

Members of each faculty evaluate and comment briefly on the two to four most interesting research papers they read each month.

For each paper they select, the Faculty Member has four tasks.

1) They write a 1-4 sentence Comment explaining why this paper is of interest. For example:

   "This outstanding paper takes us a step closer to understanding how neuronal diversity is generated during CNS development. The authors demonstrate that LIM-homeodomain proteins are determinants of motor neuron subtype identity..."

2) Each paper is then assigned to:
One of three types of Rating

	Recommended reading for a section (of specialist interest; F1000 factor of 3)
	Must read for more than one section/subject (of general interest; F1000 factor of 6)
	Exceptional landmark paper representing top 1% of publications (F1000 factor of 9)

The rating for each paper represents a consensus F1000 factor (see below) in cases where the paper is selected by more than one Faculty Member; however, the comments are individually attributed.

3) Any of four types of Classification
   - Novel finding
   - Technical advance
   - Interesting hypothesis
   - Important confirmation
4) Any relevant faculty sections (Categorisation)

For example, a paper on NGF signalling could be categorised as being relevant to 'Neurodevelopment', 'Neuronal and glial cell biology', 'Neuronal signalling'.

The F1000 Factor

Faculty members assign to each paper they select ratings of Recommended, Must Read or Exceptional, which correspond to F1000 Factors of 3, 6 and 9, respectively. If a paper has more than one evaluation, its F1000 Factor is calculated by the following formula:

F1000 Factor = Mean of Highest Two Scores + (Sum of All Scores/30)

For example, a paper picked by three Faculty members, two give it a rating of Must Read and the third a rating of Exceptional, would give it a F1000 Factor of

(6+9)/2 + (6+6+9)/30 = 8.2

This corresponds to an "Exceptional" rating badge.

Faculty of 1000 and currency

All articles selected by the Faculty Members are fully searchable and hyperlinked to PubMed, if they are indexed there (which currently virtually all of them are). The selected titles and the comments by Faculty Members are being stored and archived indefinitely. However, in order to provide currency of the relative listings (e.g. the top ten, either in biology as a whole or in a given speciality), the default option takes only those selections into account that were added to Faculty of 1000 in the last thirty days. 'All-time' listings are, of course, also available.

Examples of Faculty of 1000 Services

Subscribers will be able to define the Faculty of 1000 information that they want to receive and display it on their own My F1000 page. They receive e-mail alerts of papers newly selected by a group of Faculty Members they choose. And they receive e-mail alerts of the top-ranking papers tailored to their specific research interests on a weekly or monthly basis, depending on their choice. In the case of institutional subscription, these personalisation features are also available for those who register (at no extra cost).

Heads of Faculty

Cell biology: Alan Hall, Steven McKnight, Tony Pawson, Randy Schekman

Chemical biology: Jon Clardy, Gerald Joyce, Stuart L. Schreiber

Developmental biology: Richard Harland, Phil Ingham, Judith Kimble

Genetics & genomics: Gerald M Rubin, Shirley Tilghman

Immunology: Fred Alt, Doug Fearon, Philippa Marrack

Microbiology: Julian Davies, Stan Falkow

Neuroscience: William T. Newsome, Martin C. Raff, Carla J. Shatz, Charles F. Stevens

Plant biology: Elliot Meyerowitz, Keith Roberts

Structural biology: John Kuriyan, David Eisenberg

(Sections from the above Faculties are cross-indexed to constitute the following Faculties: Biochemistry, Bioinformatics, Biotechnology, Evolutionary biology, Molecular biology, Molecular medicine, Technical advances.)