

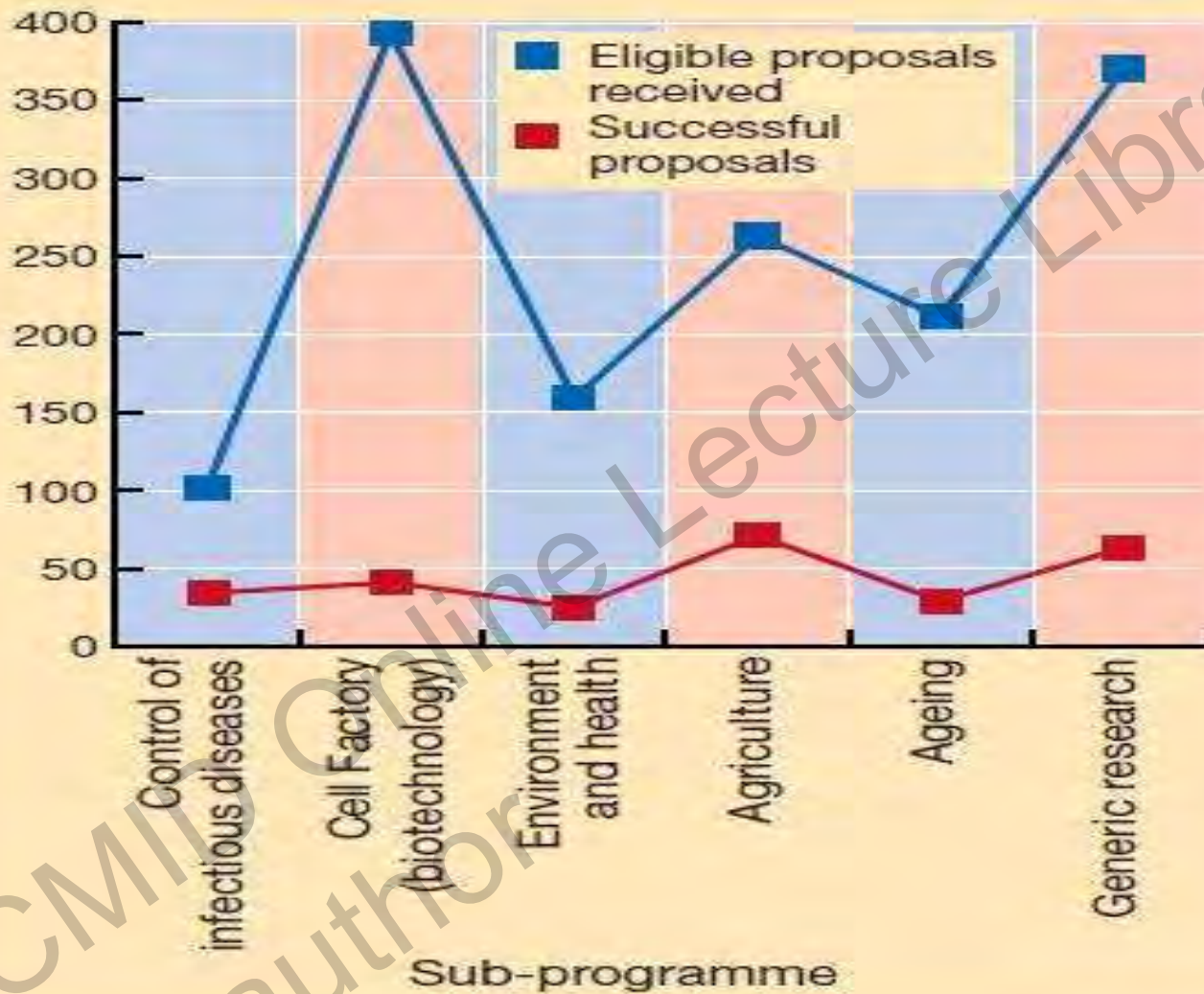
What a reviewer of a grant application wants to read

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Slim pickings: EU grants require reams of paperwork, but the chance of success is small.

Research grant application review

- Most national and international research funding organizations assess grant applications by using a grant review process
- There are considerable differences among organizations in the various aspects of grant application review, including the:
 - number of reviewers
 - remote and/or in site evaluation
 - number of rounds of review of applications
 - use or not of a separate ethics review committee

What are the main points of a research grant application that may satisfy a grant reviewer?

1. Relevance of the grant proposal to the call for research grant applications
2. Quality of the suggested scientific approach
3. Quality and reproducibility of the technological aspects of the proposed grant
4. Level of scientific innovation
5. Impact of the research project results
6. Attention to ethics concerns

Relevance of the grant proposal to the call for research grant applications

- What is the likelihood of the research proposal to meet key objectives of the research grant call?
- Frequently, researchers do not pay attention to the specific grant call request
- Subsequently, a considerable proportion of grant applications do not fit well to the specific call of grants, leading to rejection of, sometimes well thought and prepared, research projects

Quality of the suggested scientific approach

- Frequently, the research idea on which the grant application is based is interesting, however, the project may be rejected because of weaknesses in the scientific approach
- The scientific methods used in the conduct of the research project should be robust and, if possible, previously tested

Quality and reproducibility of the technological aspects of the proposed grant

Reviewers do not like gaps and uncertainties in the technological aspects of research grant applications

Reviewers also appreciate the inclusion of a list of “potential problems and trouble solving approach methods” in the grant application

Level of scientific innovation

- This is an extremely important aspect of evaluated research grants
- Reviewers appreciate potential considerable advances that may result from funding of grant applications
- Scientific progress beyond the current state-of-the-art

Impact of the research project results

Projects without potential applicable research results may not be appealing to most grant reviewers

This depends also on the aims of the specific call for research grants

Ethics concerns

- Nowadays, any concern of ethical nature may (appropriately) be a reason for rejection of a research grant application
- Reviewers want to see a fully expanded, detailed specific section of the grant application devoted to ethics points

Frustration grows over EU grant application procedures

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Improving the research grant application process

- Is there official training in peer review of scientific publications and research grant applications?
 - No
- What are the main characteristics of a good grant reviewer?
 - Fairness
 - Cumulative experience in peer review
 - Relevant research and publication experience

Are grant reviewers trained and/or qualified for this task?

A relevant survey of perspectives of research grant reviewers was published in 2010 in *BMC Medicine*

85% of grant reviewers responded that they had not been trained sufficiently in grant review

A strong record of research publications in leading positions (first or last author) usually suggests that a grant reviewer has the relevant experience in making good evaluations

Schroter S, et al.

Surveys of current status in biomedical science grant review: funding organizations' and grant reviewers' perspectives. *BMC Med.* 2010;8:62.

Is research grant review effective?

A relevant study was recently published in *Science* (2014)

The study showed that research projects with high marks in the review process produce similar numbers of publications and citations with projects with low marks

Mervis J.

Peering into peer review. *Science*. 2014;343:596-8.

What is the degree of variation between the evaluations made by grant reviewers?

A relevant article was published in PLoS ONE three years ago

The available data show that grant reviewers may differ considerably in the weight and specific marks they give to research originality, methodology and research project feasibility

Abdoul H1, et al.
Peer review of grant applications: criteria used and qualitative study of reviewer practices. PLoS ONE.
2012;7:e46054.

Is there effort in improving the quality of the grant review/evaluation process?

Various funding organizations have recently tried to enhance the evaluation process

Implementation of clear and strict relevant conflict of interest rules is important for a fair grant review process

Nowotny H, Exner P.

Improving ERC ethical standards. *Science*. 2013;341(6150):1043.

Full disclosure. *Nature*. 2014;507:8.

Perspective

Grant Application Review: The Case of Transparency

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Table 1. Major public funding agencies, annual funding levels, application success rates, and published details of the assessment process.

Agency (Country) (last annual report)	Total annual funding (million US\$)*	Success rate biomedical/life sciences	Abstract	Funding	Assessment summary	Final report
NIH (USA) (2013)	30100	14% (Medical research, 2012)	Yes	Yes	No	No
NSF (USA) (2013–2014)	7170	22% (General, 2013)	Yes	Yes	No	No
Wellcome Trust (UK) (2012–2013)	3945	25% (General, 2012–2013)	No	Yes	No	No
JSPS (Japan) (2012–2013)	3171	30.3% (General, 2012)	Yes	Yes	No	Yes
DFG (Germany) (2013)	3160	28.3% (Life Sciences)	Yes	No	No	No
NSFC (China) (2011)	2976	16.9% (Health Science, 2011) 20.9% (Life Sciences, 2011)	Yes	Yes	No	No
ERC (European Union) (2013)	2150	12%	Yes	Yes	No	No
MRC (UK) (2013–2014)	1357	21.6% (2013–2014)	Yes	Yes	No	No
CONACyT (Mexico) (2012)	937	NR	No	Yes	No	No
NSERC (Canada) (2012–2013)	933	NR for Biomedical/Life Sciences	No	Yes	No	No
CSIC (Spain) (2013)	894	NR	No	No	No	No
SNF (Switzerland) (2012)	789	50%	No	No	No	No
BBSRC (UK) (2013–2014)	777	27%	Yes	Yes	No	No
NHMRC (Australia) (2013)	748	20.5%	Yes	Yes	No	Yes
Vetenskapsradet (Sweden) (2012)	691	NR	Yes	Yes	No	No
ANR (France) (2013)	548	16.5% (General)	Yes	Yes	No	No
Academy of Finland (Finland) (2014)	395	17% (Health research, 2012)	Yes	Yes	No	No
ZonMW (Netherlands) (2011)	364	NR	Yes	Yes	No	No
NCN (Poland) (2013)	302	22% (Life Sciences)	No	Yes	No	No
FWF (Austria) (2013)	258	30.2% (General, 2012)	Yes	No	No	No
FNRS (Belgium) (2012)	225	36.9%–38.2% (2011)	No	No	No	No
DFG (Denmark) (2013)	205	23% (Medical science); 19% (General)	Yes	Yes	No	No
RFBR (Russian Federation) (2013)	200	NR	Yes	No	No	Yes
Ministry of Health (Italy) (2012)	171	NR	No	Yes	No	No
CIRM (USA) (2013)	163	42.8%	Yes	Yes	No	Yes
ISF (Israel) (2014)	136	32.8% (General)	No	Yes	No	No
HFSP (International) (2012–2013)	117	9%	Yes	No	No	No

*Arranged by decreasing total annual funding.

Funding levels and success rates are the latest as available on the funding agencies websites on October 10, 2014, rounded to nearest million US\$ according to exchange rates on that day. NR: not reported.

doi:10.1371/journal.pbio.1002010.t001

Table 3. Recommended incremental transparency measures.

Item	Should this item be published?
Abstracts (or lay abstracts)	Yes
Impact statements	Yes
Full proposals (funded only)	No*
Names of external reviewers and scientific review board members	Yes, in aggregated form, following the selection process
Detailed (external) reviews	No*
Review summaries of failed proposals	No
Review summaries of funded proposals	Yes
Ranking of proposals	Yes, only for funded proposals
Funding budget granted to projects	Yes
Call success rate	Yes
Final reports	Yes

*Starred items may be considered as radical transparency measures; at this time we deem it premature to recommend their open publication by default but would welcome small-scale experimentation in this area.

doi:10.1371/journal.pbio.1002010.t003

Guidelines for a successful European Society of Cardiology grant application

“There is no certain way of obtaining one of the European Society of Cardiology grants for research or clinical training offered each year, but Prof. Stavros Konstantinides (Centre for Thrombosis and Haemostasis, Johannes Gutenberg University, Mainz, Germany), who chairs the European Society of Cardiology Credentials Committee, which makes proposals to the ESC Board, has helped Barry Shurlock PhD to sketch a scenario that contains many useful hints”

Eur Heart J. 2014;35:1226-7.