

Qualität und Wirkung - Von der guten zur signifikanten Forschung

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High Innovation / Gain / Expectation Research

*Univ.Prof. Dr. Patrick Prendergast
Trinity Centre for Bioengineering
Trinity College, Dublin 2, Ireland
Patrick J. Prendergast" <pprender@tcd.ie*

High Innovation/Gain/ Expectation Research

Patrick Prendergast, Ph.D.
Vice-Provost/Chief Academic Officer &
Professor of Bioengineering



Trinity College Dublin
Ireland



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<http://www.nest-promise.net/>

1. Nest Promise (Promoting Research on Optimal Methodology and Impacts Promoted by Experience) was a FP6 project.
2. The aim was to promote High Innovation/Gain/Expectation (HINGE) multidisciplinary research throughout Europe.
3. Develop and validate different strategies for examining longer-term future social and environmental impacts of such research

Acronyms:

- **NEST:** New and Emerging Science and Technology (NEST) was a research fund action under the Sixth Framework Programme of the European Commission from 2001-2007
- **FP6 :** Sixth EU Framework Programme for research and technological development
- **NEST-Promise:** EU FP6 project - Promoting Research on Optimal Methodology and Impacts Supported by Experience
- **HINGE programmes:** High Innovation Gain Expectation research programmes



<http://www.nest-promise.net/>

3. List of Participants

Partic. Role*	Partic. No.	Participant name	Participant short name	Country	Date enter project	Date exit project
CO	1	Focal Initiatives in Research in Science and Technology Programme Israel Science Foundation	FIRST	Israel	1	24
	2	The Fraunhofer Institute for Systems and Innovation Research	ISI	Germany	1	24
	3	Trinity College Dublin	TCD	Ireland	1	24
	4	Institute Fundamental Technological Research (NEST-NCP) Polish Academy of Sciences	IFTR	Poland	1	24
	5	Consorzio Pisa Recherche - Information Technology and Telecommunications Division	CPR	Italy	1	24

*CO = Coordinator

1. Methodology
 - a) International survey
 - b) in depth analysis of certain programmes

2. Regional Workshops

- a) Pisa
- b) Dublin
- c) Warsaw



3. Brokerage event



High Innovation/Gain/Expectation Program Survey - Background

- To conduct a comprehensive, pan-European survey of HINGE programmes, NEST-concept promoters and other interested parties
- *Survey conducted using partner contacts, European NEST contacts, ERA-NET contacts, seed list from Workpackage 1*

Firstly to give you some background to the survey. It is one of the workpackages of the NEST-Promise project, led by Trinity College Dublin. The aim of this workpackage is '*To conduct a comprehensive, pan-European survey of HINGE programmes, NEST-concept promoters and other interested parties*'. The acronym HINGE stands for 'High Innovation/Gain/Expectation programmes'. As a starting point, we used a seed list that had been compiled using input from all NEST-Promise partners, all European NEST contacts, European Research Area Network (ERA-NET) contacts and through additional research (internet/ and Irish contacts, in particular the Irish NEST contact Imelda Lambkin).

High Innovation/Gain/Expectation Program Survey - Aims

- To provide map of such activity
 - a) To analyze the data collected and publish results*
 - b) To write a survey and Euro-map of HPs, their characteristics and distribution

- *Data analyzed: parameters established and evaluated as a whole and according to geographic area (W. Europe, E. Europe & N. America) to determine if any common characteristics emerging*

*

Research programmes that promote novel, ambitious, unconventional, and high risk research: an analysis, *Industry and Higher Education* 22, 215-221, 2008 [P.J. Prendergast, S.H. Brown, J.R. Britton]

Following distribution and return of the survey, the aim was then to provide a panoramic map of HINGE programmes. This was to be achieved by analyzing the data collected, to determine their characteristics and distribution. Surveys were examined and parameters were established relating to, for example, the Thematic Area, Programme Duration, funding, goals and criteria used. For the purposes of this presentation, the results have been summarised by extracting characteristics that featured most commonly overall, and in each of the 3 geographic areas of W Europe, E Europe and N America. Geographic distribution will also be illustrated on a map towards the end of this presentation.

Research programmes that promote novel, ambitious, unconventional and high-risk research: an analysis

P.J. Prendergast, S.H. Brown and J.R. Britton

Abstract: Many governmental agencies and private foundations provide funding programmes that aim to stimulate high-risk research which is often unconventional and from which a high social and/or economic gain is expected. In this paper the authors survey the availability of such grants in Europe. In particular, they are interested in what funding agencies hope to achieve by funding such research, and whether or not the criteria used for evaluation of research proposals is compatible with such objectives. Some definite trends are found, such as the importance given to 'originality' and the lack of favour afforded to 'speculative' projects. Similarly, 'track record' is considered important. Therefore, it would seem that the risk-taking expected of proposers is not always matched by risk-taking on the part of the funding agencies. The authors discuss the wider implications of carrying out risky and unconventional research in an academic environment.

Keywords: high-risk funding; innovation; creativity; research grants

Patrick J. Prendergast is Vice-Principal/Deputy Academic Officer at Trinity College Dublin and a former Director of the Trinity Centre for Bioengineering. He is the immediate past President of the European Alliance of Medical and Biological Engineering and Science. Sheena Brown is an Administrative Officer in the School of Engineering at Trinity College Dublin, Ireland. John Britton is a former Research Fellow at the Trinity Centre for Bioengineering and currently works for a leading management consultancy firm. Contact: P.J. Prendergast, Trinity Centre for Bioengineering, School of Engineering, Trinity College, Dublin 2, Ireland. E-mail: pprender@tcd.ie

The funding of research by national and international agencies is considered essential to the growth of knowledge and the creation of economic advantage. Funding agencies continually develop new instruments for funding research in the form of new funding programmes. In the majority of cases the research is conducted in higher education institutions by academic faculty members and contract researchers. Although

funding programmes are sometimes designed to achieve specific objectives in focused thematic areas (such as clinical treatments for specific diseases), many programmes are cross thematic and designed to fund excellence across the scientific spectrum. Occasionally, funding bodies have set an objective of achieving a very high gain for society by funding visionary research in multidisciplinary and interdisciplinary fields, often in

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The Survey

- Compiled with much assistance from Dr Thomas Heinze, Fraunhofer Institute
- 2-page Survey (send by hardcopy and by email) to 316 organisations
- Program details requested
 - Target group
 - Program goals
 - Thematic areas
 - Program duration
 - Total funding/annual spend
 - Brief program description

Now to look at the Questionnaire itself. At this point I wish to acknowledge the assistance of Dr. Thomas Heinze of the Fraunhofer Institute who contributed greatly to compiling the survey questions. The aim was to get as high a response rate as possible, naturally, and also to gain as much data as possible. The survey needed to be of a size that would not overwhelm potential respondents, and so it was limited to 2 pages. Within these 2 pages, the basic parameters were established which would go some way towards extracting the characteristics and successes of existing HINGE programmes.

The Survey

- Numbers applied for/funded by programme
 - Individuals
 - ❖ Groups
 - ❖ Collaborative projects

- Criteria important for allocating funds
 - Indispensable/Important/Not Important
 - ❖ Originality of proposal
 - ❖ Speculative nature of project
 - ❖ Potential payback to society
 - ❖ Collaboration with other institutions
 - ❖ Addressing perceived need of society
 - ❖ Track record of proposer
 - ❖ Multidisciplinarity of research

They were then asked how many individuals, groups and collaborative projects have applied for or been funded by the programme.

The Survey

- Decision process for allocation of funds in the programme; importance of external scientific peer review
- Any plans for evaluation of the programme
- Any programme outcomes considered as major successes

Respondents were asked to describe the decision process for allocation of funds in the programme and to indicate the importance of an external scientific peer review. They were also asked whether there have been or will be any plans for evaluation of the programme. Finally, they were asked to describe any programme outcomes that they considered as major successes. With these questions, the main parameters were covered to extract data that could be used to ascertain some key characteristics of the research programmes.

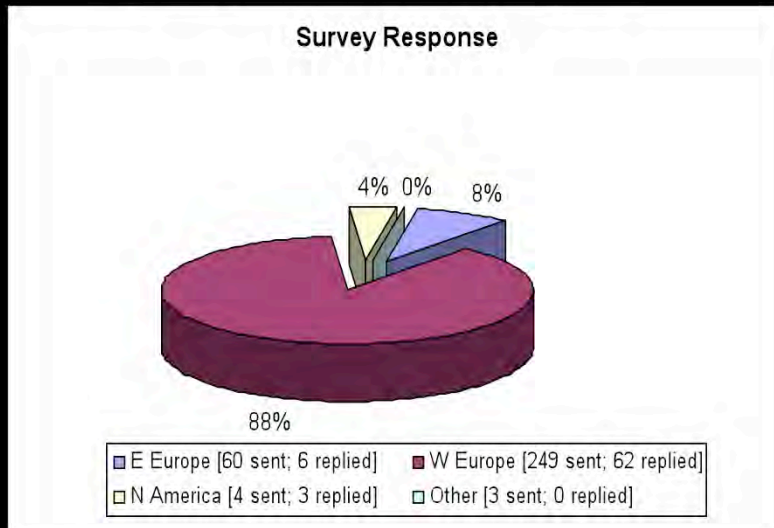
Survey parameters

HINGE Responses:		Non-HINGE Responses:	
Austria	1	Czech Republic	1
Canada	1	Denmark	1
France	4	Finland	1
Germany	9	Germany	2
Hungary	1	Greece	1
Ireland	6	Ireland	8
Israel	5	Israel	1
Italy	1	Italy	3
Netherlands	3	Lithuania	1
Spain	1	Luxembourg	1
Sweden	2	Malta	1
Switzerland	1	Netherlands	2
UK	3	Poland	3
USA	2	Spain	3
	40	Sweden	1
		UK	1
			31

71 responses of completed surveys. 22% response rate
40 of these funding schemes for high-risk research (self assessment)

Moving on to the survey results then, the Survey was sent out between April and July 2006 to a total of 201 organisations in 38 countries. Countries consisted of All 25 EU Member States, Bulgaria, Egypt, Iceland, Israel, Liechtenstein, Norway, Romania, Switzerland, Turkey, S. Africa, Canada, N. America and Japan. It was sent out in hard copy format and followed up electronically by email.

Regional Analysis



20% of questionnaires were returned, i.e. 41 questionnaires, which is the average survey return rate. At this stage it became apparent that in general, Eastern European countries generally did not tend to have high risk programmes. A returned Lithuanian questionnaire stated that there are 'no high risk/innovative projects in Lithuania'.

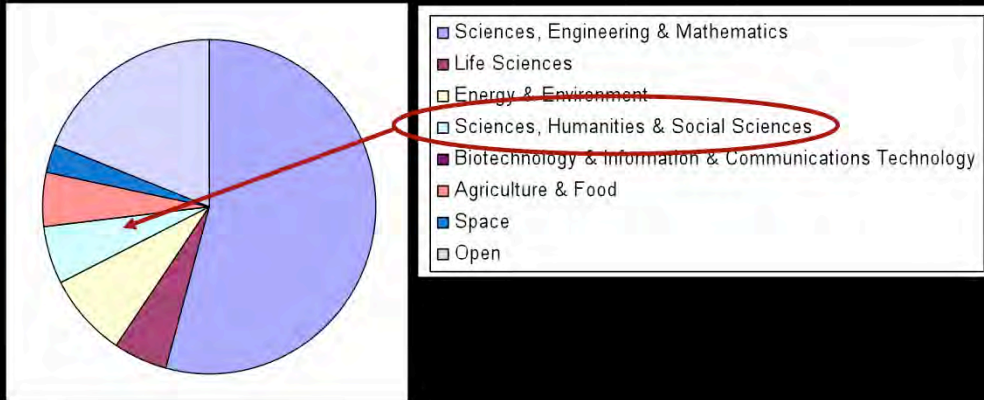
5 examples from 40 programs

- France Agence Nationale de la Recherche
 - 'Blanc' *"aims to increase ambitious projects...which present original objectives and rupture well-marked out routes of research"*
- Spanish Ministry of Education
 - Explora – Ingenio 2010 *"Funding for research that has a very high chance of not being successful, but with a very high potential impact"*
- UK Wellcome Trust
 - Sir Henry Wellcome Commemorative Awards for Innovative Research *"Initiated in 1996...it was perceived that traditional peer-review mechanisms tended to favour 'safe science' over novel and risky projects"*
- USA National Institutes of Health
 - NIH Director's Pioneer Award Program *"Research must be highly innovative, possibly high-risk, ...500k p.a. for 5 years. Purpose is to change perception that NIH funds only 'safe science'"*
- Hungary KPI Agency for research fund management
 - Janos Irinyi programme 'Idea' *"widening the possibilities for exploitation of innovative ideas and developing transfer towards industrial partners"*

Comments on previous slide re 5 examples from 40 programs:

- A qualitative analysis of 5 out of the 40 HINGE - high innovation gain expectation programs identified was given.
- The Blanc Programme funded by the French Agence Nationale de la Recherche aims to increase ambitious projects which represent original objectives and rupture well marked out routes of research, and so is what we would call high-risk, high-gain.
- The Spanish Ministry of Education Explora-Ingenio programme funds research that has a very high chance of not being successful but that has a high potential impact - this is certainly another HINGE programme.
- The UK Wellcome Trust run a project called the Sir Henry Wellcome Commemorative Awards for Innovative Research initiated in 1996, because it was perceived that traditional peer-review mechanisms tended to favour safe science over novel and risky projects.
- The USA National Institutes of Health runs the NIH Director's Pioneer Award Program. They considered this program to be for high risk research - it must be highly innovative, possibly high risk, with funding of 500,000 dollars per year for 5 years. This is significant investigator funding the purpose of which is to change the perception that the NIH funds only safe science.
- The fifth program is from Eastern Europe, the Hungarian KPI Agency for research fund management programme, the Janos Irinyi IDEAS Programme, which is widening the possibilities of exploitation of ideas and developing transfer towards industrial partners; it may be on the fringe of high risk research, but it is going in this direction.

Thematic analysis



Close-up of one program funding in Humanities & Social Sciences

- Note: looking at HINGE programs they mostly use peer-review, either by a national council, by remote reviewers, or by assembling a panel

UK EPSRC

- 'Ideas Factory': Open to all disciplines on "focused topics that need a new dimension in thinking – not just the overlap between disciplines."
 - E.g. 1: How to control guns in society?
 - E.g. 2: Taking care to the patient, new dimensions in healthcare delivery
- Innovative review procedure of a "Sandpit" of stakeholders and international experts meeting (invited after an open call for participation) at a residential 5 day workshop. Not all attendees come away with money, and review conducted 'in real time' at the sandpit. Free thinking encouraged. Participants delve deep into the problem to uncover innovative solutions
- Collaborative projects only, track record of proposer not important, started in 2005 and no projects complete yet.

Analysis of funding levels

(Examples of annual funding budgets)

Country	Funding Body	Programme Title	Annual Funding
Germany	Projektraeger Jülich	"Networks of basic research into renewable energy and energy conservation"	€10M
Hungary	KPI Agency for Research Fund Management and Exploitation	"Janos Irinyi programme 'Idea'"	€6.9M
Canada	Natural Sciences and Engineering Research Council of Canada	"Special Research Opportunity (SRO) grants"	~€10M
Israel	Israel Science Foundation	"FIRST (Focal Initiatives in Research in Science & Technology) - Track 1 - Special individual research grants"	€1.5M
Spain	CSIC	"Explora-Ingenio 2010"	€1M

Criteria for funding

Criteria	Indispensable	Important	Not Important
Originality of proposal	25	5	2
Speculative nature of project	9	17	7
Potential payback to society	8	10	13
Collaboration with other institutions	5	14	12
Addressing perceived need of society	2	17	12
Track record of proposer	14	15	3
Multidisciplinarity of research	7	17	7

Comments on Criteria for funding

Analysis of the criteria for funding was presented. Originality of proposal was seen as indispensable by the vast majority. We had assumed that originality in this context would mean scientific originality, but some responses indicated that there might be other interpretations. For example, it might refer to originality in the problem targeted (possibly using simple scientific methods to solve it) or originality in a commercial sense. Interestingly two funding bodies saw it as not important – perhaps they wanted to focus on market breakthrough, so the originality of the science might not be important.

Speculative nature of the project was not considered indispensable by the majority.

Surprisingly, the potential payback to society was not seen as the main purpose of high-risk research.

Collaboration with other institutions was seen as important by many but certainly not indispensable.

Addressing a perceived need of society was not seen as the key issue with these projects.

Very high emphasis was put on the track record of the proposer - often the people who might want to do highly speculative research might not be the ones who have a track record in terms of published research.

Interestingly, the funding agencies are not being very visionary in their selection criteria – by emphasizing track record they are being 'safe' in a way that is contrary to what they expect from the researchers themselves.

The multidisciplinary nature of the research proposal was evenly split between 'indispensable' and 'not important'.

These are perspectives of the funding bodies that try to promote this kind of research. One might conclude that a HINGE project, on average, is one that shows definite originality but is not overly speculative, and originates with a proposer who has an established track record.

Discussion Points 1

- Limitations:
 - Hinge vs non-HINGE is a moderated self-assessment, and classification cannot be precise
 - Some HINGE programs may not have responded

Of the 41 respondents, 21 of these fund high risk/innovative research programmes. 9 countries are represented by these 21 respondents: Austria, Canada, Germany, Hungary, Ireland, Italy, Spain, Sweden & USA. When grouped into geographic areas, we have 17 in W Europe, 1 in E Europe and 3 in N America.

Discussion Points 2

- **Some conclusions can be drawn**
 - 40 HINGE (High-Risk High-Impact) programs. This *high* number indicates the importance governments place on funding risky, novel research.
 - Many HINGE programmes are relatively new so....continuous search for new and better ways of motivating the research community
 - Some funding bodies perceive the need to encourage research to 'get of the beaten track'
 - Funding levels are relatively low
 - Not an even distribution of programmes (probably reflects general state of grant availability?)
 - What determines 'originality'?

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Discussion Points 3

- **Knowledge production**
 - Mode 1 versus Mode 2
 - Mode 1: Normal science- working in the paradigm (peer-review & 'track record' important, autonomy the scientist)
 - Mode 2: Trans-disciplinary, subject to multiple accountabilities (not 'normal science' then why prioritize peer-review and "track record")
 - Where does HINGE programme research lie – can it be achieved by funding bodies committed to Mode 1?

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Discussion Points 4

- **Peer review**
 - Does it need to be modified to enable funding of risky research
- **Philanthropic funding**
 - No emphasis on administrative accountability – therefore funding source for risky research. Large private foundations *truly* prepared to take risks
- **Labour environment for risky research**
 - Academic environment.....Post Doctoral researchers, young faculty
 - Spin-out environment.....rewards commensurate with risks

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Conclusions in presentation

- High risk, high innovation, net gain programmes do exist – by ‘self-assessment’
- a “fringe” activity (for most research funders)?
- Many issues arise if funding ‘risky’ research is to be pursued

Additional discussion points

- The definition of high-risk needs greater specific elaboration in this discussion; at the moment it is not specific enough to let us decide what 'risky' actually is – the suggestion was made that the example given (of a longitudinal study on ageing) is not risky, and indeed could be funded by many funders. However I would counter that, in fact, there are not many funders that would comit to a 20 year study and in that respect it does contain risk.
- The point was made that VC funding is a critical part of the picture
- A point was made that, let us consider a breakthrough research project form the past and ask: Could any project proposal be written that would be gauranteed to give that funding? The answer is probably no – so it is not the emphasis on “track record” that is to blame. Project-type funding funds exactly that – projects, not breakthroughs but rather science as a practice.
- “Where is the discussion of the Humanities?” – my answer would be that humanities can also produce high impact high net-gain research and it was not discounted.

Acknowledgements



<http://www.nest-promise.net/>

NEST Promise partners, particularly Dr Thomas Heinze, University of Twente

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