

Report of the Visiting Committee on FIRST

June 2001

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Introduction

In 1997 the Israel Academy of Sciences and Humanities (Academy) established an experimental programme for the proactive funding of basic research, named FIRST (Focal Initiatives in Research in Science and Technology). This programme was designed to complement the current national system of open, competitive, researcher-initiated grant applications, by proactively stimulating research in fields which are important for Israel's science or are of an interdisciplinary character. The program is supported by contributions from The Revson Foundation, Yad Hanadiv Foundation, B. de Rothschild Fund, the Planning and Budgeting Committee (PBC) of the Council for Higher Education, and the Israel Science Foundation (ISF).

In initiating the programme, the Academy decided that there would be a review at three years, some time before the completion of the programme.

The President of the Academy, Prof. Jacob Ziv, appointed a Visiting Committee earlier this year with the following terms of reference:

1. To examine the rationale for establishing FIRST in the context of the Israeli system for supporting basic research, considering also the policies of the Israel Science Foundation (ISF) and that of similar national systems abroad.

2. To assess the performance of FIRST during its first three years of active operation.
3. To advise the Academy on Israel's need for continuing FIRST, or some variant thereof.

The members of the Committee are listed in Appendix 1.

Procedures

The Visiting Committee met in Jerusalem for three days, June 13-15, 2001. Prior to the meeting the Committee received extensive material describing the FIRST programme and information on all the applications received and granted (Appendices 2,3) including progress reports. It should be noted that only one of the projects had run full term and some had run for two years and several for one year. The Committee interviewed a number of research administrators and grantees (listed in appendix 4). Valuable input was obtained from the Vice Presidents for Research and Development of two universities, who were able to give the Committee a view of the impact of FIRST on their particular constituencies. The Committee interviewed awardees from within the three fields chosen by FIRST. Extensive discussions were held with chairmen of two funding organizations supporting competitive basic research. The Committee further interviewed a member of the Board of FIRST who is also a member of the FIRST Scientific Evaluation Committee.

The proceedings began with introductions by the President of the Academy and by the Senior Advisor to the President. Dr. Yossi Segal was in attendance and gave valuable support as Secretary of the Committee.

Conclusions and Recommendations

1. The Visiting Committee is strongly of the opinion that there is a need for supporting centrally initiated research in selected fields. Thus a special mechanism is required to support proposals whose novel approach or interdisciplinary content, which inherently carry a large risk, are difficult to be judged adequately by the traditional review system. FIRST has proven its efficacy in this respect, based on the principles on which it was established and with which we agree. It provides a vehicle for initiating and developing fields which are neglected and are considered as important for the future of science in Israel. The Committee believes that this approach is crucial for the well-being of research in Israel, and that the institution of a permanent organization of this type would provide the impact and continuity required.

2. To ensure the continuation of FIRST type initiatives, the Committee recommends that FIRST become regularized as a specialized programme of the ISF, but kept separate in function.

- It should have its own scientific Board, reporting to the Board of the ISF. The Chairman of FIRST should be appointed by the President of the Academy in consultation with ISF, and it should include a representative of the Academy.
- It should have its own budget.
- Its Board should establish its own committees for reviewing and selecting proposals.

- The Board will be responsible for the selection of the set subjects in the FIRST programme.

3. One of the primary functions of FIRST should be to identify those areas of basic research which are insufficiently developed and yet are of strategic importance to the country.

Another important function of FIRST is to support novel and risky research in all areas of science.

Therefore it will be an important responsibility of the Board of FIRST to generate mechanisms for identifying new priorities and for terminating activities in existing prioritized areas.

While the Committee does not wish to prescribe these mechanisms, it:

- Urges the Board to solicit inputs from senior Israeli scientists, world scientists well acquainted with Israeli science, and Vice Presidents for R&D, as to the fields to be supported by FIRST, and to reach its decisions after consultations with the head of the ISF.
- Recommends that when an area is added to the list of FIRST-supported fields, a time limit of no more than 3 or 4 years will be set. In exceptional cases, the Board may decide to extend the period of support by FIRST by an additional 2 years.
- The Committee also suggests that appointments to the Board be for 3 years, renewable at most once.

4. Currently, the budget of FIRST, US \$1 M a year for three years, represents about 2.5 % of the ISF budget, and an even smaller proportion of the total available Israeli funds devoted to competitive basic research. On the evidence presented to us, the Committee considers the first three years to have been a success, which justifies a continuation of FIRST. And indeed, the Committee recommends an increase of the budget of FIRST to a higher share of the available funds. From discussions with both research administrators and V.P.s of Research and Development, a consensus emerged that up to 10% of the ISF budget would be acceptable for FIRST type initiatives. This proposition is based on the expectation that the budget of the ISF will be increased significantly by the PBC of the Council for Higher Education, so that the absolute sum involved would not represent a reduction of the funds available through the normal funding system of ISF.

5. The support should usually be granted for 3 years, but under certain conditions we recommend the possibility of an extension for a further period of 2-3 years.

The condition for such a renewal is that substantial progress has been made but that the proposal is not yet ready for submission to the regular funding agencies. In such cases, the review should be conducted in the early part of the third year.

There may also be occasions when a period less than 3 years is called for, for example to seed a new project or to complete an existing one.

6. In the first phase of the FIRST programme, proposals were initiated in three selected fields of potential importance to Israeli science: nanoscience, interactive computer science and quantitative trait loci (QTL). Without questioning the wisdom of that choice, or the principle of selecting fields, the Committee recommends that a small part of the budget be reserved for supporting proposals outside the predefined areas, provided they meet the general criteria of FIRST. Good and relevant interdisciplinary projects have less chance of being accepted under conventional funding procedures. Given the nature of many societal problems to be studied within the Israeli context, interdisciplinarity should certainly include behavioural and social sciences, and the humanities.

7. The Committee commends FIRST for use of part of its funds to support other functions, such as sending young scientists abroad for further training in selected subjects, and for organizing conferences in new fields under consideration.

It recommends the continuation of these activities. It further recommends

extending the functions of FIRST for other purposes, such as the possibility of using FIRST for attracting young scientists back to Israel. Indeed, there are some young Israeli scientists working abroad in subjects that should be introduced or strengthened in Israel. This function of FIRST should be made known to Israeli research institutions, and FIRST should consider suggestions from Universities as to how to implement this policy.

8. The Committee has the following suggestions concerning the modes of operation of FIRST:

- i. Ad hoc review committees should be appointed whose composition should include national or international experts as appropriate.
- ii. Time from submission to judgment should not be longer than three months.
- iii. It is implied that when an application is made to the ISF, the decision is to be left to the applicant as to whether the proposal goes to the main stream or to the FIRST Board.
- iv. It is equally open to the committees of ISF and to the FIRST Board to redirect applications whenever judged appropriate.

Appendix 1

FIRST Visiting Committee

1. Prof. Sir Aaron Klug - Chairman

Hon. Professor of Molecular Biology, University of Cambridge. Nobel Laureate in Chemistry 1982. President of The Royal Society (1995 - 2000). Director of the MRC Laboratory of Molecular Biology (1986 - 1996). Presently at The MRC Laboratory where he leads a research group on the regulation of gene expression.

2. Prof. Edouard Brezin

Professor of Physics at the Ecole Normale Supérieure. Former Chairman of the Board of Trustees of CNRS (French National Center for Scientific Research). Member of the Académie des Sciences.

3. Prof. dr. Pieter J.D. Drenth

Professor of Psychology, at the FU, Amsterdam (1967 -). Former Rector Magnificus of this University (1982-1987); former President of the Royal Netherlands Academy of Arts and Sciences (1990-1996); former Chairman the Royal Netherlands Academy's Social Science Research Council (1997-2001). Presently President of All European Academies (ALLEA).

4. Prof. Sydney Leach

Emeritus Research Director, CNRS, Former Director of the Laboratoire de Photophysique Moléculaire at CNRS (1967-1983), former President of the French National Scientific Society in Physical Chemistry. Presently, Chairman, Advisory Board, Institute for Storage Ring Facilities (ISA), Aarhus, Denmark and Fellow of the Royal Society, and Fellow of the Institute of Physics.

5. Prof. Israel Pecht

Professor of Immunology. Former Chairman of the Israel Science Foundation (1991-1994). Presently, President of ICSU's International Union of Pure and Applied Biophysics, and Head of the Immunology Department, the Weizmann Institute.

6. Dr. Shmuel Winograd

Dr. of Applied Mathematics and Computer Science. Former head of the Mathematical Sciences Department, IBM Corp., Thomas Watson Research Center. Presently, IBM Fellow. Member of the US National Academy of Sciences.

Secretary:

Dr. Yossi Segal, Israel Academy of Sciences and Humanities



האקדמיה הלאומית הישראלית למדעים
THE ISRAEL ACADEMY OF SCIENCES AND HUMANITIES
FOCAL INITIATIVES IN RESEARCH IN SCIENCE AND TECHNOLOGY
(F.I.R.S.T.) קרן ביכורה

PROJECTS FUNDED BY FIRST - 1997

NANOSCIENCE

Application No: 1/97
Applicant Name(s): Erez Braun, Technion \$ 200,000 /1st year
Uri Sivan, Technion \$ 100,000 /2nd year
Yoav Eichen, Technion \$ 100,000 /3rd year
Title of Proposal: Nanoelectronics by Biotechnology

PROJECTS FUNDED BY FIRST - 1998

NANOSCIENCE

Application No.: 8/98
Applicant Name(s): Oded Millo, Hebrew University of Jerusalem
Uri Banin, Hebrew University of Jerusalem
Title of Proposal: Combined Tunneling/Optical Spectroscopy Studies of
Semiconductor nanocrystals - Towards an Optoelectric
Nanodevice
\$ 60,000 / year x 3 years

INTERDISCIPLINARY APPLICATIONS OF
COMPUTER SCIENCE

Application No.: 21/98
Applicant Name(s): Michal Linial, Hebrew University of Jerusalem
Nathan Linial, Hebrew University of Jerusalem
Title of Proposal: Charting the Space of Proteins
\$ 33,000 / year x 3 years

Application No.: 28/98
Applicant name(s): Eytan Ruppin, Tel Aviv University
Yechezkel Yeshurun, Tel-Aviv University
Title of Proposal: Efficient Evolution and Analysis of Autonomous Agents
\$ 33,000 /year x 3 years

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PROJECTS FUNDED BY FIRST -1999

NANOSCIENCE

- Application No:** 4/99
Applicant Name(s): Gil Markovich, Tel-Aviv University
Alexander Palevski, Tel-Aviv University
Title of Proposal: Measurement and Control of Electron Transport in Chemically Fabricated Nanowires
\$ 63,000 /year x 3 years
- Application No:** 9/99
Applicant Name(s): Mario Feingold, Ben-Gurion University
Yigal Meir, Ben-Gurion University
Zvi Priel, Ben-Gurion University
Title of Proposal: DNA biosensors: Using DNA as a sensitive spring
\$ 20,000/year x 1 year
- Application No:** 10/99
Applicant Name(s): Shlomo Yitzchaik, The Hebrew University of Jerusalem
Yossi Shapir, The Hebrew University of Jerusalem
Micha Spira, The Hebrew University of Jerusalem
Title of Proposal: Neuro-Electronic Hybrid Devices
\$ 36,000 /year x 2 years
(Funding for 3rd year will be decided after progress report for 2nd year.)
- Application No:** 11/99
Applicant Name(s): Reshef Tenne, Weizmann Institute
Hagai Cohen, Weizmann Institute
Tsofar Maniv, Technion
Title of Proposal: Single Layer Inorganic Nanotubes: Synthesis and Characterization
\$36,000/1st year
\$30,000/2nd year
Funding for third year will be decided after progress report for 2nd year.

**INTERDISCIPLINARY APPLICATIONS OF
COMPUTER SCIENCE**

Application No: 15/99
Applicant Name(s): Nissim Francez, Technion
Jonathan Ginzburg, The Hebrew University of Jerusalem
Title of Proposal: Semantics of Natural Language Temporal
Questions and Interfaces to Temporal Database
Systems
\$ 25, 000 /year x 3 years (+ \$ 5,000 for software)

Application No: 20/99
Applicant Name(s): Orna Kupferman, The Hebrew University of
Jerusalem
Raz Kupferman, The Hebrew University of
Jerusalem
Title of Proposal: Formal Analysis of Numerical Methods
\$25,00 /year x 3 years

QUANTITATIVE TRAIT LOCI (QTL)

Application No: 25/99
Applicant Name(s): Darvasi Ariel, The Hebrew University of Jerusalem
Title of Proposal: The Genetic Basis of Bipolar Affective disorder (BAD)
\$92,000 / year x 3 years

Application No: 26/99
Applicant Name(s): Karl Skorecki, Technion
Sara Selig, Technion
Nadine Cohen, Technion
Title of Proposal: Cladistic Analysis of Candidate Quantitative Trait Loci:
Proof of Concept and Application to Complex
Polygenic Disease in Heterogeneous Populations
\$ 92,000 / year x 3 years

PROJECTS FUNDED BY FIRST - 2000

NANOSCIENCE

Application No.: 8/2000

Applicant Name(s): Ziv Reich, Weizmann *Institute*
Dan Shahar, Weizmann Institute

Title of Proposal: A Novel, Capacitor-based, Single-Molecule Motion Detector \$
55,000 / year x 3 years

Application No.: 9/2000

Applicant Name(s): Danny Porath, Tel-Aviv University
Eshel Ben-Jacob, Tel-Aviv University
Eli Kapon, Tel-Aviv University

Title of Proposal: DNA Spectroscopy: Towards DNA-Based Nanoelectronics
\$ **45,000** / year x 3 years

Application No.: 24/2000

Applicant Name(s): Oren Regev, Ben Gurion University
Rachel Yerushalmi-Rozen,
Ben-Gurion University

Title of Proposal: Ordered Arrays of Nanotubes
as Devices for Molecular Electronics
\$ **55,000** / year x 1 year

INTERDISCIPLINARY APPLICATIONS OF COMPUTER SCIENCE

Application No.: 29/2000

Applicant Name(s): Edit Doron, The Hebrew University of Jerusalem
Mori Rimon, The Hebrew University of Jerusalem
Dana Ron, Tel-Aviv University
Yoram Singer, The Hebrew University of Jerusalem

Title of Proposal: Crossing the Chasm: Linguistic Structures and
Automatic Learning from Examples
\$ **40,000** /year x 3 years

Application No.: 34/2000

Applicant Name(s): Amihud Amir, Bar-Ulan University
Ron Ungar, Bar-Ulan University
Gad M. Landau, Haifa University

Title of Proposal: Alex Bolshoy, Haifa University
String Matching on a Genomic Level:
Theory and Practice \$
40,000 / year x 3 years

Application No.: 35/2000

Applicant Name(s): Yoel Hitovsky,
The Hebrew University of Jerusalem

Title of Proposal: Foundations of Statistical Inference:
Applications in the Medical and Social Sciences,
In Industry and the Interface With Computer
Sciences
\$ 10, 000 / year x 1 year

QUANTITATIVE TRAIT LOCI

Application No.: 1/2000

Applicant Name: Yoav Benyamini, Tel Aviv University
Karen Avraham, Tel Aviv University

Title of Proposal: Development of Statistical Tools for
QTL Analysis and Modelling
\$ 87,000 / year x 3 years

FIRST FUNDING (Thousands of U.S. Dollars)

	'97	'98	'99	'00	'01	'02	'03
Nanoscience	\$200	\$160	\$315	\$349	\$163	\$100	-
Int. Computation		\$66	\$ 121	\$206	\$ 130	\$80	
Q.T.Loci	-		\$ 184	\$271	\$271	\$87	-
TOTAL	\$200	\$226	\$620	\$821	\$564	\$267	-

TOTAL: \$ 2,698

Appendix 3

Proposals Submitted to FIRST

Field/Year	1997	1998	1999	2000	Total
Nano-Science	1	19	12	25	57
Computer Science	-	13	10	7	30
QTL	-	-	6	3	9
Total	1	32	28	35	96

Appendix 4

Program of FIRST Visiting Committee

13 - 15 June 2001, Hermon Room, Inbal Hotel

Wednesday, 13 June

- 10:00 AM Meeting with the Academy's President at Breakfast
- 11:30 AM Private meeting of the Visiting Committee for planning its work.
- Lunch
- 2:30 PM Interview - Prof. Yair Aharonowitz, Vice-President for R&D, Tel-Aviv University
- 3:30 PM Interview - Prof. Zamik Rosenwaks, Vice-President for R&D, Ben-Gurion University
- 4:30 PM Interview - Prof. Uri Sivan, awardee in Nano-Science, Technion
- 5:15 PM Interview - Prof Natan Linial, awardee in Interactive Computer Science, Hebrew University

Thursday, 14 June

- 9:00 AM Interview - Dr. Yona Ettinger, Executive Director BSF (US-Israel Binational Science Foundation)
- 10:00 AM Interview - Prof. Paul Singer, Chairman of the Board ISF (Israel Science Foundation)
- 11:00 AM Dr. Ariel Darvasi, awardee in QTL, Hebrew University
- Lunch

Afternoon:

- 3:00 PM Interview - Prof. Jacob Bar-Tana, a member of the QTL Committee, member of the Board of FIRST
- Talk with Prof. Alex Kynan Evaluation

Friday, 15 June

- 8:30 - 2:00 PM Evaluation, Summation and Report¹⁹