European Research Council

erc

ERC Starting Grant 2010
Step 1 Evaluation Report

CONFIDENTIAL

Call reference	ERC-2010-StG
Activity	ERC Starting Grant
Funding scheme	ERC Starting Grant
Panel name	LS5 - Neurosciences and neural disorders
Proposal No.	260589
Acronym	SpontaneousFlies
Panel decision on Career Stage	Consolidator
Applicant Name	Björn Brembs
Title	What is the default-mode of insect brains?

PANEL MARKS

1. Principal Investigator ***Quality of research output/track-record:*** *How well qualified is the Principal Investigator to conduct the project (reviewers are expected to evaluate the quality of the prior work such as published results in top peer review journals as well as other elements of the Principal Investigator's CV), taking into account the early or more mature phase of his/her transition to independence, as well as prior career breaks and/or unconventional research career paths (especially in the case of women scientists). To what extent are the publications and achievements of the Principal Investigator groundbreaking and demonstrative of independent creative thinking and capacity to go significantly beyond the state of the art? Taking account of the particular circumstances of the Principal Investigator and the proposed research, including any funding already secured, to what extent will an ERC Starting Grant make a significant contribution to the establishment or consolidation of independence?*	**2.33 / 4**
2. Research project ***Ground-breaking nature of the research:*** *Does the proposed research address important challenges at the frontiers of the field(s) addressed? Does it have suitably ambitious objectives, which go substantially beyond the current state of the art (e.g. including inter- and trans-disciplinary developments and novel or unconventional concepts and/or approaches)? How well conceived and organized is the proposed activity?* ***Potential impact:*** *(a) Does the research open new and important, scientific, technological or scholarly horizons?* *(b) Will the project significantly enhance the research environment and capabilities for frontier research in Europe (including the host institution)?* ***Methodology:*** *Is the outlined scientific approach (including the activities to be undertaken by the individual team members) feasible?* ***High-gain/High-risk balance:*** *a) does the proposed research involve highly novel and/or unconventional methodologies, whose high risk is justified by the possibility of a major breakthrough with an impact beyond a specific research domain/discipline?*	**2.5 / 4**
Total mark	**4.83 / 8**
Has the proposal passed the thresholds (2/4) for criteria 1 and 2?	**Yes**

PANEL COMMENT

This evaluation report contains the final marks awarded by the ERC review panel during the first step of the ERC Starting Grant review. The panel based its appraisal on prior individual reviews conducted by ERC panel members.
The panel closely examined all the individual review reports and, while not necessarily subscribing to each and every opinion expressed, found that they provide a fair overall assessment. The comments of the individual reviewers were the basis for the discussion and the final recommendation of the panel, and are included in this report.

As seen from the individual reports, the project was perceived as conceptually interesting and original, but technically daunting. Also, the proposal seemed optimistic in areas where the applicant has little expertise: without specific driver lines targeting individual neuron populations, there seems to be little chance to record interpretable data.

Overall the panel considers the proposal of good quality, however at a relatively low position in the ranking order. The panel therefore recommends that the proposal should not be retained for Step 2 and funding.

REVIEWER COMMENTS

Reviewer 1

1. Principal Investigator:

Quality of research output / track-record:
The PI has an interesting record for unconventional and sometimes pioneering, sometimes controversial research in Drosophila behaviour, with a more recent focus on spontaneous behaviour and operant learning. Earlier graduate work pioneered the study of aggression. Original studies on operant learning in Aplysia as postdoc. A proven ability to think outside the box and produce original and interesting findings. Arguably too much focus on the behaviour itself, with less effort to exploit genetic and physiological methods available in Drosophila to explore the underlying neural mechanisms. Others do this in areas the PI has pioneered.

Publications and achievements:
See above for full details.

Establishment or consolidation of independence:
See above for full details.

2. Research project:

Ground breaking nature of research:
The project is conceptually interesting and original, but technically daunting; the PI seems too optimistic in areas where he has little expertise. The goal is to look for a default-mode network in patterns of spontaneous activity in the fly brain, through fast (10Hz) whole-brain imaging of immobilized unstimulated flies, in flies walking spontaneously on a track ball, and flies turning in response to visual or olfactory stimuli. This poses vast technical challenges in preparing and imaging flies, and in mining enormous amounts of data. The PI declares to have the relevant expertise or contacts, but has neither demonstrated prior expertise in these areas nor addressed these issues specifically in the extended synopsis. Sample-to-sample variation in the relative damage resulting from dissection and photodamage, in the degree of physical constraint, and in the specific brain regions imaged will make it extremely challenge to identify reproducible patterns in spontaneous activity (or presumably, changes therein) and relate these to behaviour. One wonders whether Drosophila is really the best model for this work, as other genetic model systems (C. elegans, zebrafish larvae) could be imaged much less invasively and with far less constraint in their locomotion. Mechanistic studies are mentioned as a goal, as is modelling. Neither of them is explained in detail, but in any event these are unrealistic goals at this point.

Potential impact:
See above for full details.

Methodology:
See above for full details.

High-gain/High-risk balance:
See above for full details.

Reviewer 2

1. Principal Investigator:

Quality of research output / track-record:
The candidate is an experienced researcher interested in how operant and classical learning interact. He has a good grant track record recently and has shown evidence of invention and no fear of carrying out frontier science. He is independent but his h-index is somewhat low for his seniority. His publications are few but reflect a desire to tackle methodologically difficult problems.

Publications and achievements:
Please see the paragraph above.

Establishment or consolidation of independence:
Please see the paragraph above.

2. Research project:

Ground breaking nature of research:
The project extrapolates from the popular concept of a default mode network derived from human work to propose a broad theory of interaction between operant and classical synaptic learning, basing the arguments on evolutionary principles and biochemical differences. The proposal consists in moving from man to drosophila and using sophisticated optical scanning methods and task free compared to stimulated flies (the description of behavioural manipulation techniques is fascinating). This is true frontiers research but it is difficult to judge whether what is proposed is technically possible. The 5 experiments are logically described and if feasible should lead to the desired outcomes.

Potential impact:
Please see the paragraph above.

Methodology:
Please see the paragraph above.

High-gain/High-risk balance:
Please see the paragraph above.

Reviewer 3

1. Principal Investigator:

Quality of research output / track-record:
The PI has, not demonstrated expertise in 2P imaging, in particular using the small signals provided by genetically encoded indicators.

Publications and achievements:
Amongst his papers are the first demonstrations of aggressive behaviour in Drosophila.

Establishment or consolidation of independence:
The PI and a relatively small group and are already covered by the Heisenberg stipend. The grant would first and foremost cover the purchase of the 2P equipment.

2. Research project:

Ground breaking nature of research:
Yes, understanding background or resting activity is important.

Potential impact:
Recording from all different parts of the brain simultaneously with single cell resolution would be wonderful.

Methodology:
Without knowing where to focus, using specific driver lines to express the genetically encoded indicator, it will be almost impossible.

High-gain/High-risk balance:
Imaging in behaving animals has already begun, in mice as well in Drosophila.