

# SOL – Switchable Opsins for Life Sciences

ERC synergy grant awarded summer 2020

to run Oct 2021-2027



Left to right:

Rob Lucas (Manchester);  
Neuroscience

**Gebhard Schertler (PSI,  
Switzerland);  
(Lead)**  
Structural Biology

Peter Hegemann (Humboldt  
University, Berlin);  
Photobiology/chemistry

Sonja Kleinlogel (Berne)  
Physiology



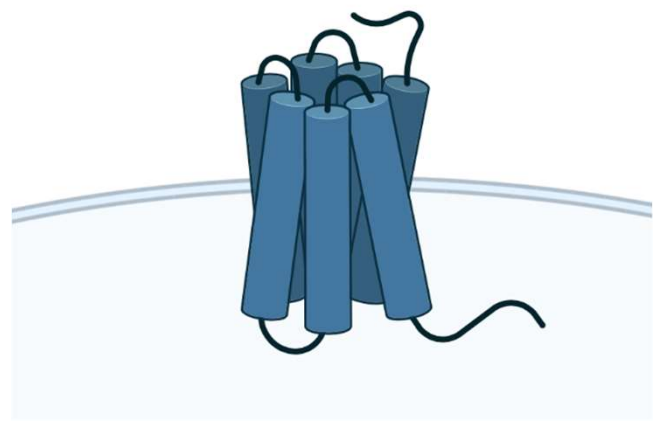
Gregor Cicchetti (PSI)  
Scientific Relations Manager



Xavi Deupi (PSI)  
Structural Biology



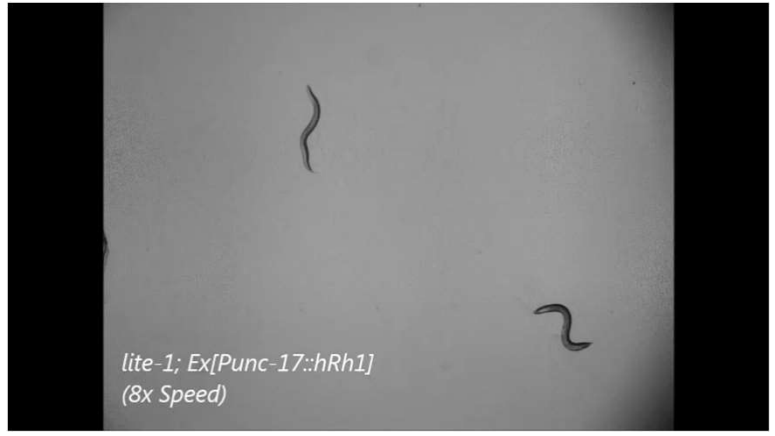
# Opsins



Switched on by light

Created with BioRender.com

...can be used as biological 'switches'

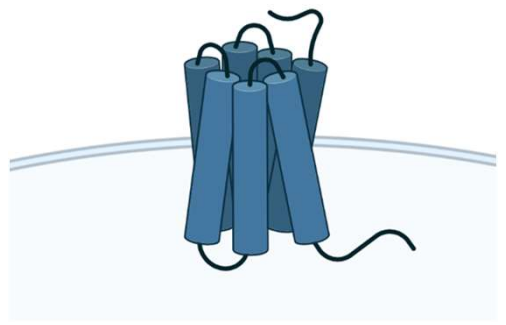


## Applications:

*Experimental*

*Therapeutic*

e.g. restoring vision, chronic pain, hormonal imbalance, neurological conditions, etc etc



**Objective:**

**Engineer opsins to provide switchable and selective control over numerous biological processes**



Determine structure

*Schertler & Hegemann*



Understand how structure determines function

*Lucas & Hegemann*



Rational Engineering

*All*



Exemplar Applications

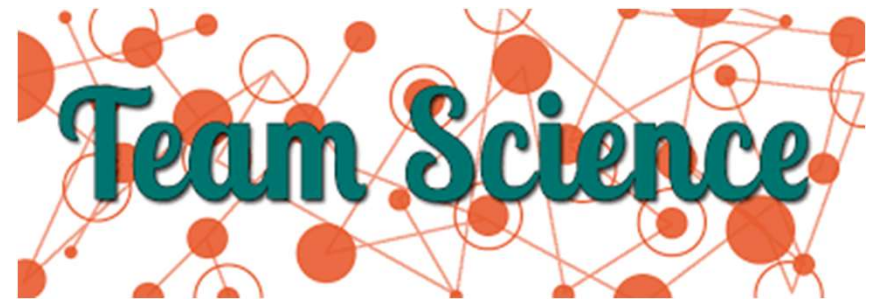
*Kleinlogel & Lucas*

## Bringing the consortium together ....

- Have an ambitious scientific goal which can only be achieved in a cooperation between three or four major labs.
- The project should be interdisciplinary and the partners have to take complementary roles.
- Choose well respected partners but consider also your experience and personal contacts.
- Do not hesitate to include partners that are not straight forward to agree to come into the grant. Put science first!
- From the first conversations onwards build trust between the partners and grow the commitment to the project
- Involve all partners early in developing the ideas and writing a project draft.



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## Preparing the proposal ...

- A coherent story line with appropriate roles of the different PIs is critical. Have an agreed summary early on where everyone can refer to.
- Timing in the grant proposal is critical. All partners must be able to start and finish at the same time.
- Clearly justify the role of each partner for each step in the grant
- Consider that ERC grants should empower you to get out of your comfort zone. Do not come across in the grant as if you just do what you always do.
- Have the proposal read and revised by outside people who care about the project. It is important that it reads as one coherent text.
- All statements in B1 must be consistent with the more detailed work packages described in B2.
- Proposals usually are significantly longer than acceptable under the grant rules in the first go. Do not take the task of shortening lightly and leave it to the very end.
- Leave enough time for adjustments of formalities to ERC specs, in particular the CV and the budget.



Source: <https://absolutelymaybe.plos.org/2016/03/17/how-to-spot-research-spin-the-case-of-the-not-so-simple-abstract/>



<https://absolutelymaybe.plos.org/2021/04/04/a-cartoon-guide-to-criticism-scientist-edition/>

Passed stage 1 (B1)

1<sup>st</sup> submission 2018-19

.....Expert review – 9 reviewers.

Stage 2 (panel evaluation) - scored B (not taken through to interview)

**Panel comments (selected):**

**Positive:**

ambitious and potentially innovative proposal  
acknowledged the importance and interest in the proposed research on the high-resolution structure  
proposal is of overall high quality

**Negative:**

questions about the technical requirements  
justification for a dedicated instrumentation  
precise objective and strategy pertaining to the in vivo validation in mouse models  
synergy between participants was insufficient.  
other aims are less developed and justified.  
protein-structure aim alone has sufficient potential for a successful project.

- Reviewer comments are the most valuable input for re-submission.
- Follow recommendation if you can but if they affect to team consistency or they change and threaten your conviction to the project, stick to your concept and at the same time strengthen your proposal. Upon re-submission you will have

Research grant rejection  
**5 Stages of Grief**

### 1. Denial



*"Dear Program Manager, there seems to have been an error..."*

### 2. Anger



*"I will never apply to your lousy, corrupt funding agency again."*

### 3. Bargaining



*"If you just let me respond to the reviewers... I can fix this..."*

### 4. Depression



*"I'm never going to get tenure..."*

### 5. Acceptance



*Resubmit same proposal with different title, smaller budget...*

Source: <https://www.ifm.eng.cam.ac.uk/research/grant-writers-handbook/cartoons/>

Fully revise every aspect of the grant for the re-submission beyond the reviewer comments. This is NOT a paper revision but a new proposal.



- If you made it through the first stage, the interview is deciding on your success.
- It is critical to come across as a real coherent team (Plan for management between Pis)
- Decide who can present the proposal best, rationally and emotionally for the overall goals of the project
- If possible all partners should present to the panel.
- Decide early on a coherent story line.
- From the beginning, practice the timing.
- Present it to a mixed mock panel which must consist of strong independent scientists and grant advisers familiar with ERC interviews. Carefully consider all feedback and comments of the audience.
- Extensively prepare a list with possible questions and rehearse the answers. Agree how you will assign questions to the partners during the interview and practice with a mock audience asking questions.
- Make sure the answers are short and precise so the panel can get through all of its prepared questions in the assigned time slot. Avoid discussion exchanges.
- Ideally, all questions in the real interview have been considered during the practice sessions.
- Make sure that all partners are equally presented in the answering of the questions by the panel.
- Two days before the interview, meet practice in person with your partners. Further improve the



*"Is it just me or are these review panels getting a lot tougher?"*

Source: <https://www.ifm.eng.cam.ac.uk/research/grant-writers-handbook/cartoons/>

**Panel Summary:**

The presentation given by the applicants during the interview and the answers to the questions that were addressed greatly contributed to build the panel's view about the proposal's strengths and weaknesses.

Both the individual reviews and the interview were the basis for the discussion and the final recommendation of the panel.

The proposal addresses the highly ambitious and challenging topic of dramatically extending optogenetics to a large variety of biological systems and questions by using bistable rhodopsins. The plans to study these light-gated G-protein coupled receptors in three major aspects (molecular mechanisms with structures, dynamics, bistability and selectivity, rational engineering to generate new optogenetic tools with defined activity and sensitivity, and application in vivo) are timely and very important for reaching a new level in optogenetics research. The panel acknowledged the very well written proposal, the clear synergy of the team of PIs and the excellent presentation in the interview. The team of PIs is considered outstanding and combines all the expertise needed for successfully performing this ground-breaking project.

The panel therefore recommends the proposal to be retained



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