

Personal experience with the submission of an ERC Starting Grant

“PREDATOR” (Call 2018, LS3 panel)

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ERC project vs expertise

Starting a new research direction built on the unique combination of my previous research expertise

PhD: Pathogenic bacteria that **proliferate inside** host cells
(relatively **small** bacteria, **difficult genetics**)

Postdoc 1: How bacteria organize their molecules **in space and time** to achieve a complex **cell cycle**
(quantitative microscopy on living bacteria)

Postdoc 2: How bacteria respond to **stress in their envelope**

ERC project: unraveling how **tiny** predatory bacteria **proliferate inside** the **envelope of other bacteria** in a **non-canonical** cell cycle, by monitoring the **spatiotemporal organization** of key **cell cycle** regulators inside living cells

About my background / track record

- **Not an exceptional publication list**
 - no Nature/Cell/Science as 1st author,
 - only 2 papers as 1st author (excluding reviews) by the time of submission
- BUT I have **highlighted positive aspects**:
 - **No gap** in my CV (at least 1 publication at each step)
 - All steps provided me with **distinct expertise that I am combining** in the ERC proposal
 - **Co-authorships** in high impact papers → I explained my exact role in those + connection with the ERC
 - 1 paper as **leading (last) author**: explained why and how it is good for the ERC project
 - 2 postdocs in **top labs** in the fields
 - 2 research stays **abroad**
 - Examples of **many connections**
 - 1 **review that is highly cited** in the field

Timeline of transforming an idea into an ERC project



2016

“Predatory bacteria are so cool and unexplored, let’s follow their lifecycle under the microscope”

- Workshop on ERC @ UCLouvain
- Submitted an **FNRS research credit proposal for a pilot study**
- First nice preliminary results
- NCP Info Session: confirmed that my idea is “ERC-able”
- **I could explain my model system and approach to my grandma in just 1 sentence.**

2017

- Submitted an **FNRS Research Associate proposal built on the pilot study’s results**
- 1st feedback from anonymous experts in the field
- **Talked to a lot of people in closely-related fields**

→ **Refined the concept to make it broad + ERC-style: raising key biological questions, identifying the knowledge gap and justifying the model**

- Writing the ERC proposal (1.5 month full-time)

2018

- Interview in June
- Result in July
- Started public market for the purchase of a microscope in September

2019

ERC StG begins

Writing the grant: Tips that worked well for me

- **Identify the weak points of your CV or the risk associated with your method and address all of them explicitly in the proposal** to anticipate all reviewers' concerns (ex. "she has no paper on that bacterium").
- Take advantage of all sections where there is no fixed canvas or page length to **explain and clarify everything**.

5. **G. Laloux** and C. Jacobs-Wagner, "Spatiotemporal control of PopZ localization through cell cycle-coupled multimerization" *J. Cell Biol.*, 201(6): 827–841, 2013. Impact factor 10.822.

Publication without PhD adviser **Relevance to this proposal:** Demonstrated expertise in bacterial chromosome replication and segregation mechanisms (one work package of this proposal aims at uncovering a novel mechanism of chromosome segregation in bacteria), quantitative live imaging of a complex bacterial cell cycle and protein dynamics within bacterial cells of ~1 μm long.

Important note on publications **I do not have a paper on *B. bacteriovorus* yet. This is because** I have been working on the pilot study since the summer of 2016 to build tools and assess feasibility of the project. However, my preliminary results are highly encouraging (see the research proposal). Moreover, **the risk inherent to working with this small and non-classical bacterium is mitigated by (i)** my experience with

- **Exploit the ERC vocabulary as clear subtitles** so the reviewers immediately see what they are looking for (e.g. Key Intermediate Goal #6; "Expected Outcome of WP3")

PREDATOR Workflow

	WP1.1	WP1.2	WP2	WP3.1	WP3.2	Technical support
Year 1	Postdoc 1	PhD 2*		Postdoc 3		Technician 1 (50%)
Year 2	Postdoc 1	PhD 2*	PhD 1	Postdoc 3		Technician 1 (50%)
Year 3		Postdoc 2+ PhD 2*	PhD 1		Postdoc 4	Technician 1 (50%)
Year 4		Postdoc 2+ PhD 2*	PhD 1		Postdoc 4	Technician 1 (50%)
Year 5		Postdoc 2	PhD 1		Postdoc 4	Technician 1 (50%)

* Not funded by ERC

Writing the grant: Risk management

- Main risk of my project = technical aspect
The proposed microscopy setup may not provide sufficient resolution to monitor subtle changes in molecules localization within the cells
 - I **acknowledged the risk clearly** in the proposal and explained why I chose this method over the super-resolution ones (which often give artefacts in the particular case of living bacteria)
 - Say that if needed, we will perform super-resolution with **collaborators who are experts in the field** and that we have already identified (give names + what they will do)
 - Mention **previous experience** with imaging intracellular molecules in tiny cells
- For most parts of the scientific projects, present a **backup plan** or explain what knowledge you will obtain even if not all experiments work as expected.

Writing the grant: Reviewing by experts before submission

- Plan enough time to **have it read by people in closely-related fields**
 - Choose people you know well so you can interpret their feedback properly
 - Choose people who were successful in obtaining several major grants before

!! Tell them which PANEL you have in mind:

- Initially I wanted to submit to panel LS6 (immunity and infection)
- **After review I decided to switch to LS3 (cell and developmental biology)** to avoid irritating some specialists of LS6 (one of the points mentioned in the state of the art is not widely accepted yet, but it is not the focus of my project)
- I took the **risk** that there would be no microbiologist in the panel, but all should appreciate the cell biology approach.

ERC interview

- **Mock interviews:**
 - start with one that gives you lots of confidence, then challenge yourself with a “tough” panel with expertise similar to your ERC panel.
 - I remodeled my slides thoroughly after the last one → plan for enough time
 - I only had 2. You will get many, sometimes contradictory suggestions.

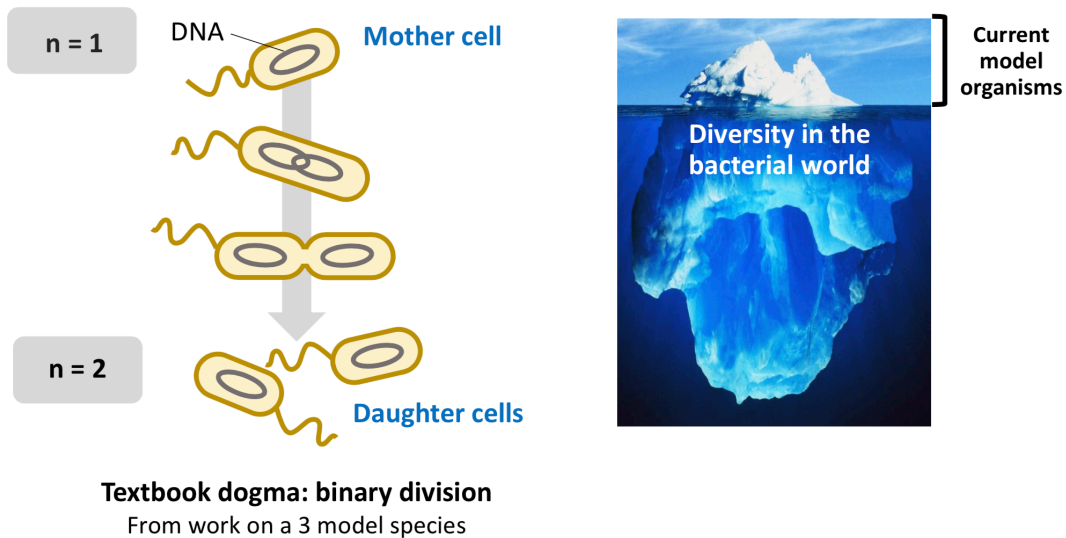


- **Waiting room:** 5-10 other candidates sweating, pacing and studying in the room – I listened to feel-good music instead (I recommend The Beach Boys)

ERC interview

- Presentation (10 min in my case):
 - **I didn't follow the outline of B1/B2:** revised the outline to get to the big picture quickly
 - Catchy elements / very simple slides / **make your point very clear (ex: the title of a slide was "Why now?")**


A huge knowledge gap in bacterial cell biology



PREDATOR outcome

Key steps towards unraveling novel mechanisms of fundamental processes:

e.g. novel insights into the non-binary processing of a circular chromosome in bacteria



Discovery of the first prey-induced cell-cycle control in predatory bacteria

Good luck!