applying for an ERC grant

Daniel Bendor
Lecturer in Behavioural Neuroscience
Department of Experimental Psychology

2001

BSc in Electrical Engineering

2001-2007

PhD in Biomedical Engineering

Neural coding of pitch perception

Johns Hopkins University

2007-2013

Postdoctoral research in Neuroscience

Memory encoding in the hippocampus

Massachusetts Institute of Technology

2013- current

Lecturer in Experimental Psychology

neural coding of memory and perception

University College London

Research is expensive….

Estimated start up costs: >£100k

data acquisition system = £30k
sound chamber = £17k
sound generation equipment = £10k
fluorescent microscope = £50k

Running costs (per year): >£50k

postdoc = £40k
consumables/animal costs = £10k

ways to get money for research

startup funds = £0-50k

ways to get money for research

startup funds = £0-50k

small grants = £15-30k

Royal Society Research Grant

ways to get money for research

startup funds = £0-50k

small grants = £15-30k

Royal Society Research Grant

research council new investigator grants = £300-500k

3 years: 1 postdoc, portion of your salary + consumables,
limited money for equipment (which needs a contribution from UCL)

ways to get money for research

startup funds = £0-50k

small grants = £15-30k

Royal Society Research Grant

research council new investigator grants = £300-500k

3 years: 1 postdoc, portion of your salary + consumables,
limited money for equipment (which needs a contribution from UCL)

Wellcome Trust Investigator Awards and ERC starting grants = £1-1.5 million

5 years: 2 postdocs, portion of your salary + consumables,
sufficient money for equipment

Why apply for an ERC grant: the good, the bad, and the ugly

Why apply for an ERC grant: the good, the bad, and the ugly

The Good:

1) one of the largest grants for new investigators
2) can alternatively be applied to as a fellowship
   (can pay 100% of your salary)
3) has a 25% indirect rate: UCL gets £300k

Why apply for an ERC grant: the good, the bad, and the ugly

The Good:

1) one of the largest grants for new investigators
2) can alternatively be applied to as a fellowship
   (can pay 100% of your salary)
3) has a 25% indirect rate: UCL gets £300k

The Bad:

1) competitive (9% success rate)
2) 2 step process (application and interview)

Why apply for an ERC grant: the good, the bad, and the ugly

The Good:

1) one of the largest grants for new investigators
2) can alternatively be applied to as a fellowship
   (can pay 100% of your salary)
3) has a 25% indirect rate: UCL gets £300k

The Bad:

1) competitive (9% success rate)
2) 2 step process (application and interview)

The Ugly:

1) a lot of paperwork (*but the ERC office at UCL helps*)

what you need to apply for an ERC grant

what you need to apply for an ERC grant

1) at least one publication without your PhD supervisor as an author in a top tier journal (Impact factor>10)

what you need to apply for an ERC grant

1) at least one publication without your PhD supervisor as an author in a top tier journal (Impact factor>10)

2) commitment from UCL to host you.

what you need to apply for an ERC grant

1) at least one publication without your PhD supervisor as an author in a top tier journal (Impact factor>10)

2) commitment from UCL to host you.

3) obtained your PhD less than 7 years ago (from January 1st 2016). Exceptions are made for time taken off for childcare.

what you need to apply for an ERC grant

1) at least one publication without your PhD supervisor as an author in a top tier journal (Impact factor>10)

2) commitment from UCL to host you.

3) obtained your PhD less than 7 years ago (from January 1st 2016). Exceptions are made for time taken off for childcare.

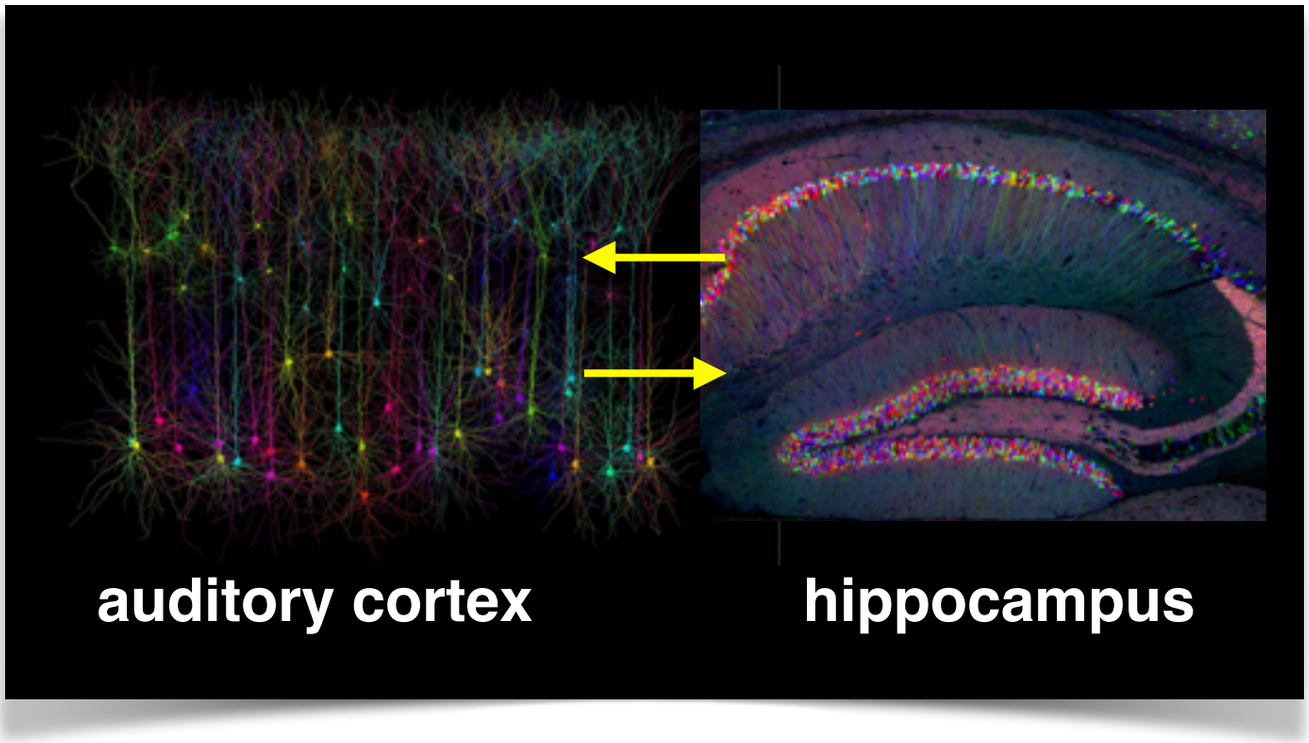
4) an idea that is “ground-breaking, ambitious, and feasible”

My timeline

September 2013	Arrived in UCL
November 2013	started writing grant
March 2014	submitted ERC grant
June 2014	Invited to round 2 (interview) ~20% of applicants successful
October 2014	Interview in Brussels
November 2014	notified of results ~50% of interviewees successful
April 2015	ERC grant starts

A little about my grant…

The Role of **C**ortico-**H**ippocampal **I**nteractions during **M**emory **E**ncoding



How do two brain areas communicate with each other during the storage of new memories?

Why I picked this research question

Why I picked this research question

1) combines together my PhD training (auditory cortex) and postdoc training (hippocampus).

you need to make an argument that you are uniquely positioned to do this research given your expertise.

Why I picked this research question

1) combines together my PhD training (auditory cortex) and postdoc training (hippocampus).

you need to make an argument that you are uniquely positioned to do this research given your expertise.

2) Based on my published postdoc work, but includes some unpublished data.

helps demonstrate your expertise.

Why I picked this research question

1) combines together my PhD training (auditory cortex) and postdoc training (hippocampus).

you need to make an argument that you are uniquely positioned to do this research given your expertise.

2) Based on my published postdoc work, but includes some unpublished data.

helps demonstrate your expertise.

3) Part of a larger central question in neuroscience: “How does our brain store memories?

easier to demonstrate that your question is worth funding

Why I picked this research question

1) combines together my PhD training (auditory cortex) and postdoc training (hippocampus).
you need to make an argument that you are uniquely positioned to do this research given your expertise.

2) Based on my published postdoc work, but includes some unpublished data.
helps demonstrate your expertise.

3) Part of a larger central question in neuroscience: “How does our brain store memories?
easier to demonstrate that your question is worth funding

4) my research question requires using “state-of-the-art” and cross-disciplinary techniques: large-scale electrophysiology, optogenetics, chemogenetics, computational, behavioural
they are looking for cutting-edge approaches to science. easier to justify giving you lots of money

Why I picked this research question

1) combines together my PhD training (auditory cortex) and postdoc training (hippocampus).

you need to make an argument that you are uniquely positioned to do this research given your expertise.

2) Based on my published postdoc work, but includes some unpublished data.

helps demonstrate your expertise.

3) Part of a larger central question in neuroscience: “How does our brain store memories?

easier to demonstrate that your question is worth funding

4) my research question requires using “state-of-the-art” and cross-disciplinary techniques: large-scale electrophysiology, optogenetics, chemogenetics, computational, behavioural

they are looking for cutting-edge approaches to science. easier to justify giving you lots of money

5) provides flexible lines of research, and purchase of equipment I need for future experiments

With the ERC grant, you actually have to write 2 grants

Part B1 (the short grant 5 pages)

Part B2 (the long grant 15 pages, only read if you are shortlisted):

20 pages may seem like a lot, but if it makes you feel better, the ERC is paying you about £55,000 a page.

With the ERC grant, you actually have to write 2 grants

Part B1 (the short grant 5 pages):

1.background:
what we know, what we don't know, and why we should care

2.list research aims (one sentence max per aim)

3.why this research is *state of the art* and *important*

4.why you are *uniquely placed* to do this research

5.describe each aim with hypothesis, methodology, and prediction

A few tips for grant writing

Part B2 (the long grant 15 pages, only read if you are shortlisted):

what is your central question?

What are your objectives?
list aims (and sub-aims) and hypotheses in detail

State of the art: why is your research/methodology novel, an advantageous strategy, and cutting-edge
(basically why would your results get into Nature or Science)

Methodology: describe planned experiments in detail
Methods, Analysis, Hypothesis, Potential pitfalls and alternative strategies

A few tips for grant writing

Three main aims (+-1): must be able to state these briefly, and ideally in pictorial form

they should be related, but not too interdependent (if aim 1 fails, it shouldn't prevent you from doing aim 2)

A few tips for grant writing

Three main aims (+-1): must be able to state these briefly, and ideally in pictorial form

they should be related, but not too interdependent (if aim 1 fails, it shouldn't prevent you from doing aim 2)

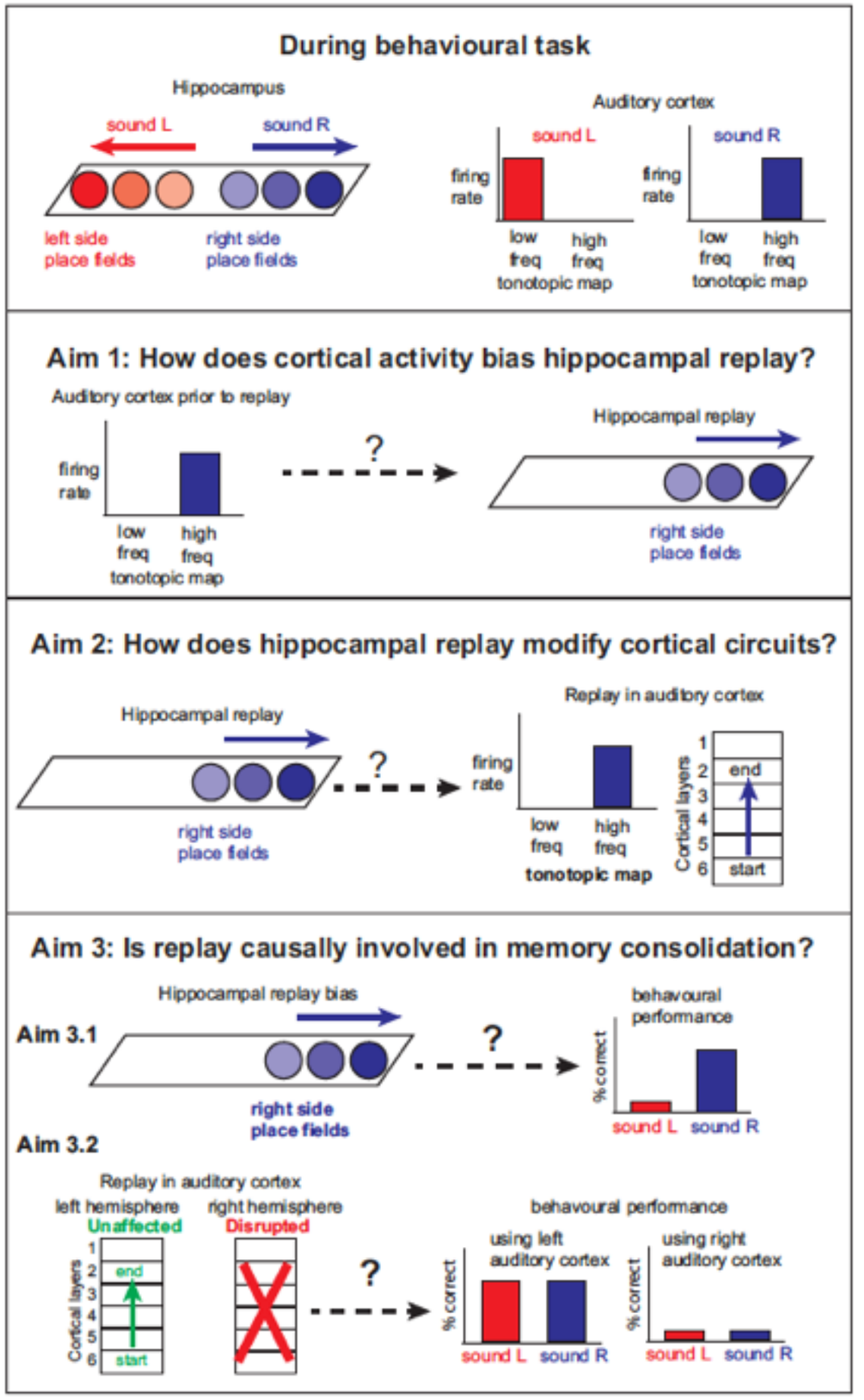


Figure 3: Outline of proposal's objectives and predictions

A few tips for grant writing

Structure of grant: easy to read, highlight what is important for the reader to understand

highlight the aims and hypothesis

Aim 1: We will examine how cortical activity influences which spatial trajectory is replayed by the hippocampus

***Aim 1.1 Hypothesis*:** increased spontaneous activity in a tonotopic region of auditory cortex biases the replayed behavioural episode towards the spatial trajectory associated with that tonotopic area during the previous behavioural task.

Aim 1.2 Hypothesis: increasing spontaneous activity in a tonotopic region (using optogenetics) can causally lead to a replay bias of the behavioural episode (similar to aim 1.1).

highlight advantages

spatial trajectory "mentally traversed" by the rodent during a replay event. *This provides a significant advantage in studying memory encoding, as we can now study how the replay of a specific behavioural episode leads to memory consolidation of that experience.* We will exploit this advantage to accomplish three main aims in this research project:

1) ***Examine how cortical feedback influences which spatial trajectory is replayed by the hippocampus***
2) ***Investigate how the hippocampal replay of a behavioural episode modifies a cortical circuit***
3) ***Determine whether cortico-hippocampal interactions causally impact memory consolidation***

These three aims will provide a substantial step towards understanding the underlying mechanisms responsible for memory encoding and consolidation, and establish a framework for future research studying cortico-hippocampal interactions. These experiments require cutting-edge, large-scale electrophysiology

highlight predictions

activity in auditory cortex following a replay event in the hippocampus, and examine tonotopic and laminar specific differences in activity that relate to different replayed spatial trajectories. ***Our prediction*** *is that replay in auditory cortex is driven by the behavioural episode that is reactivated in the hippocampus, such that after the onset of a replayed spatial trajectory (hippocampus), increased activity will be observed in the*

A few tips for grant writing

Hypothesis driven grounded in a central, important question

Ideally both the success or failure of your experiments should be informative.

A few tips for grant writing

Hypothesis driven grounded in a central, important question

Ideally both the success or failure of your experiments should be informative.

Write for a wide audience

the expert should be satisfied with your methodology, but make sure that the non-expert understands why you are doing the experiment

A few tips for grant writing

Hypothesis driven grounded in a central, important question

Ideally both the success or failure of your experiments should be informative.

Write for a wide audience

the expert should be satisfied with your methodology, but make sure that the non-expert understands why you are doing the experiment

Reach out to your colleagues with grant experience.

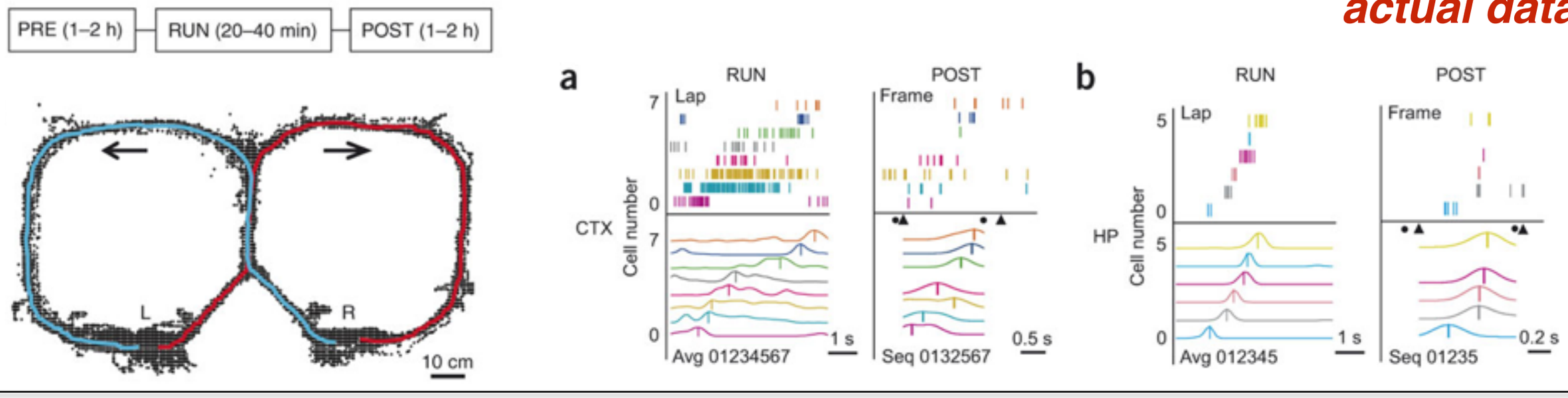
Discuss your aims before writing the grant

Multiple people should critique your grant

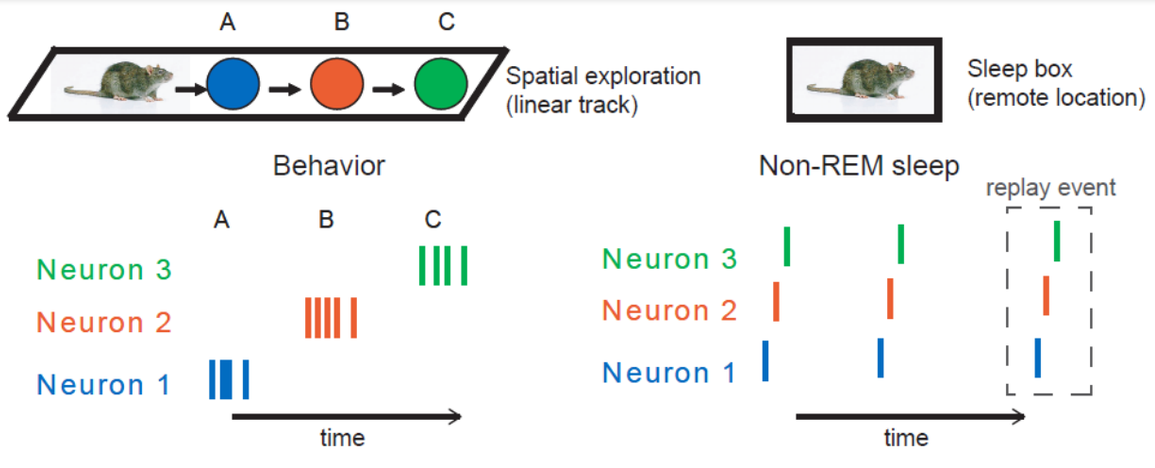
A few tips for grant writing

Show cartoons instead of published data

actual data



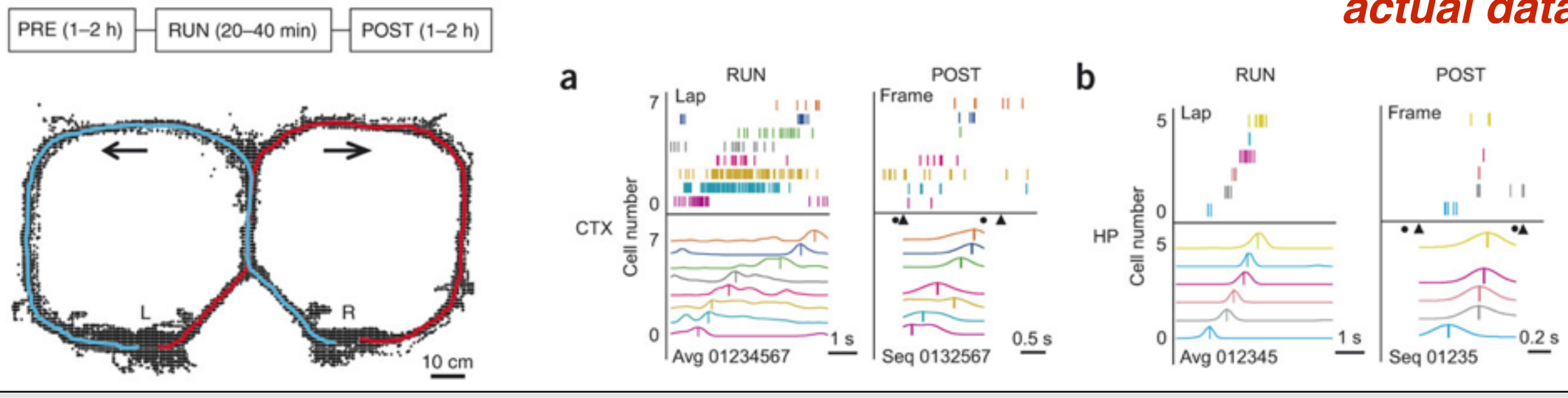
cartoon of data



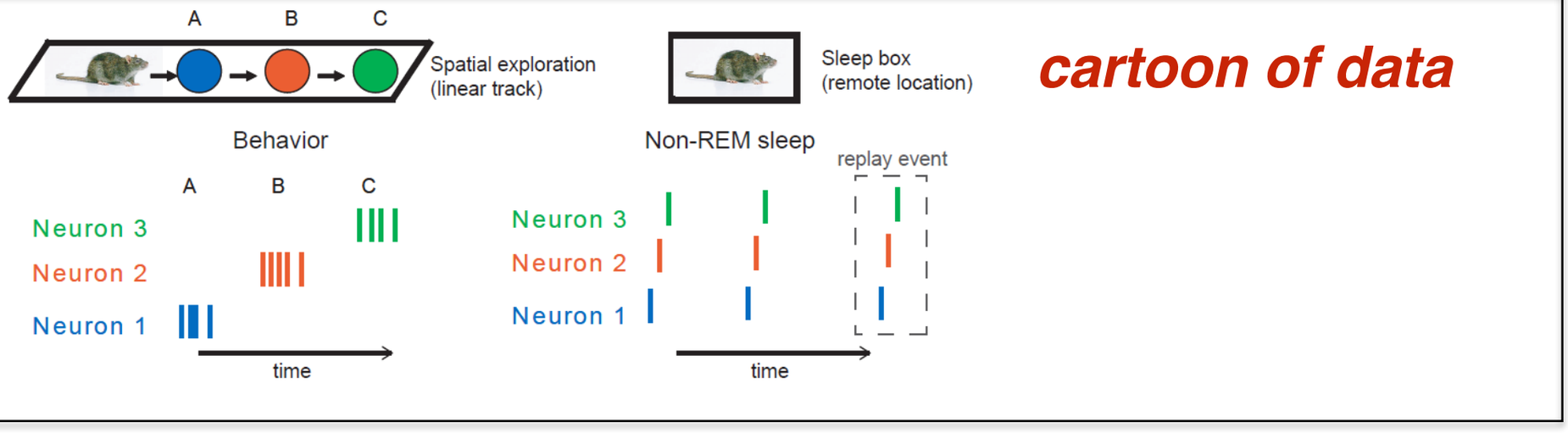
A few tips for grant writing

Show cartoons instead of published data

actual data



cartoon of data



But show the real data when its unpublished…

The interview (and how to prepare for it)

20% of proposals get invited for an interview in Brussels

Prepare a 10 minute talk. Exactly 10 minutes. Maybe 9 minutes to be safe….

10 minutes of questions from panel of 12 people

The interview (and how to prepare for it)

the talk

1. general intro
2. central question
3. what we know
4. what we don't know (with hypotheses)
5. methods and expertise
6. behavioural task
7. aim 1
8. aim 2
9. aim 3
10. What is new and expected outcome

The interview (and how to prepare for it)

the process

The interview (and how to prepare for it)

the process

1.arrive at the ERC building

The interview (and how to prepare for it)

the process

1.arrive at the ERC building

2.fill out some forms (the ERC likes forms) and get your security badge

The interview (and how to prepare for it)

the process

1.arrive at the ERC building

2.fill out some forms (the ERC likes forms) and get your security badge

3.hang out in the waiting room
silently going over your talk in your head, while smiling at the other people you are competing with

The interview (and how to prepare for it)

the process

1.arrive at the ERC building

2.fill out some forms (the ERC likes forms) and get your security badge

3.hang out in the waiting room
silently going over your talk in your head, while smiling at the other people you are competing with

4.when called, take an awkward elevator ride up to your interview, only to be put in another waiting room. *This one smells like sweat.*

The interview (and how to prepare for it)

the process

1.arrive at the ERC building

2.fill out some forms (the ERC likes forms) and get your security badge

3.hang out in the waiting room
silently going over your talk in your head, while smiling at the other people you are competing with

4.when called, take an awkward elevator ride up to your interview, only to be put in another waiting room. *This one smells like sweat.*

5.then they call you to the interview room.
They say hi. Ready. Go. you give your perfectly timed 10 minute talk….

<u>The interview (and how to prepare for it)</u>

the questions

1. outside experts who have read your long grant
2. questions from panel (usually non-experts)
some of these questions will be completely random

<u>The interview (and how to prepare for it)</u>

the questions

1. outside experts who have read your long grant
2. questions from panel (usually non-experts)
some of these questions will be completely random

very important:
have at least one mock interview beforehand

The interview (and how to prepare for it)

very, very important:
go to this place after your interview concludes
(not beforehand)