CON^{2}PHYS — Pre-COSYNE Brainhack 2026

What this document is. This PDF lists the CON^{2}PHYS questions and answer options. Do **not** submit answers in this PDF.

What you need to do:

- Submit an answer to **Question 1**.
- To enter the prize draw, also answer **one additional question of your choice**.
- Submit your answers via the dedicated **Google Form**

Why we ask for this. If registrations exceed capacity, we will prioritise applicants who completed Question 1. This is to ensure that participants have downloaded and explored the dataset, and arrive prepared. The second question is only to enter the prize draw.

All the necessary information to download the data and answer the questions is available on the **brainhack website**. For more context on CON^{2}PHYS, please see here.

Q1. Which brain area has the lowest firing rate over the entire recording?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q2. Which brain area has the highest broadband LFP power (1–100 Hz) over the entire recording?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q3. Which brain area (if any) has the highest density of ripples (i.e. "hippocampal" ripples traditionally occurring during sharp wave-ripples)?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q4. In which brain area are pairwise spike train interactions strongest at the 100 ms timescale?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q5. Which brain area pair has the strongest undirected functional connectivity?

- ☐ **A)** Brain area 1 $\Leftrightarrow$ Brain area 2
- ☐ **B)** Brain area 1 $\Leftrightarrow$ Brain area 3
- ☐ **C)** Brain area 2 $\Leftrightarrow$ Brain area 3
- ☐ **D)** Not enough data / no differences

Q6. Which brain area pair has the strongest directed functional connectivity?

- ☐ **A)** Brain area 1 ⇒ Brain area 2
- ☐ **B)** Brain area 3 ⇒ Brain area 2
- ☐ **C)** Brain area 3 ⇒ Brain area 1
- ☐ **D)** Not enough data / no differences

Q7. Which brain area has the highest density of putative fast-spiking interneurons based on spike waveform and/or spike train features?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q8. In which brain area are spikes most strongly phase-locked to its own LFP in the 4–10 Hz range?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q9. Which brain area has the highest excitation-inhibition ratio (i.e., the strongest relative excitation)?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q10. Which brain area has the shortest intrinsic neuronal timescale during baseline activity?

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q11. Which brain area contains most information about variable A? Exclude inter-trial intervals. The specific trial segment on which to base the analysis is not given because it cannot be determined *a priori* for variable A.

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q12. During which trial segment is variable C best decoded?

- ☐ **A)** Trial start ⇒ Stim start
- ☐ **B)** Stim start ⇒ Outcome
- ☐ **C)** Outcome ⇒ Trial end
- ☐ **D)** Not enough data / no differences

Q13. In which brain area is the dimensionality of neural activity highest? Use the segments from stimulus presentation to outcome to answer this question.

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q14. In which brain area is modularity the lowest? Use the entirety of the recording to answer this question.

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences

Q15. In which brain area is the neural signal most complex? Use the segments from stimulus presentation to trial end to answer this question.

- ☐ **A)** Brain area 1
- ☐ **B)** Brain area 2
- ☐ **C)** Brain area 3
- ☐ **D)** Not enough data / no differences