

# **Supporting information 2 for: Cortical ignition dynamics is tightly linked to the core organization of the human connectome**

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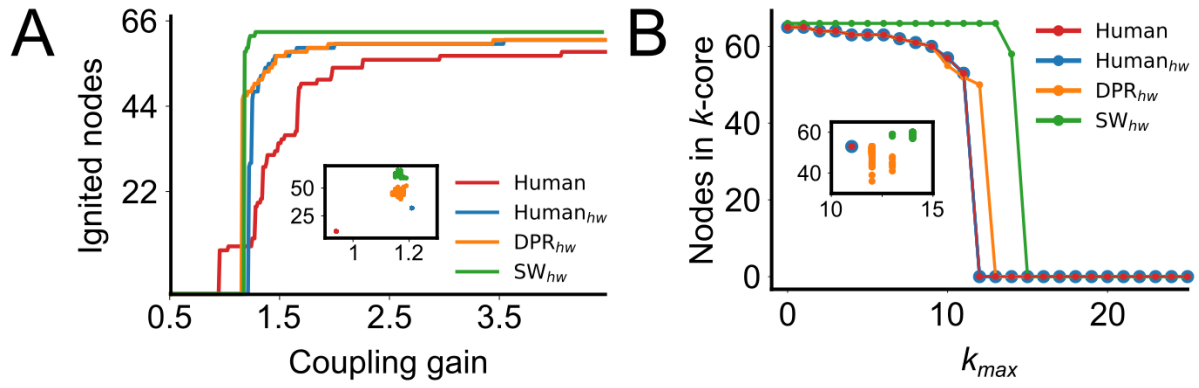
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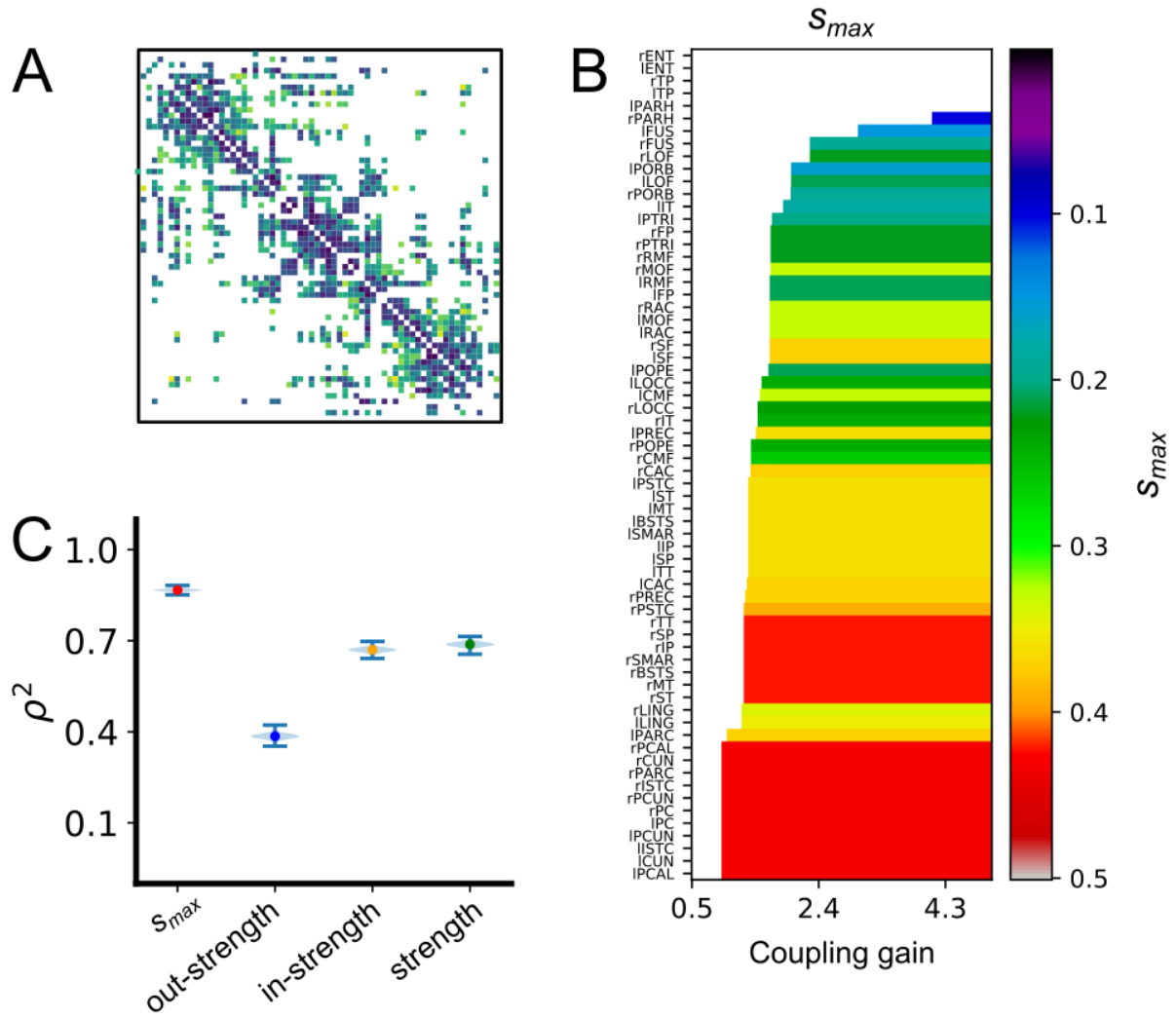
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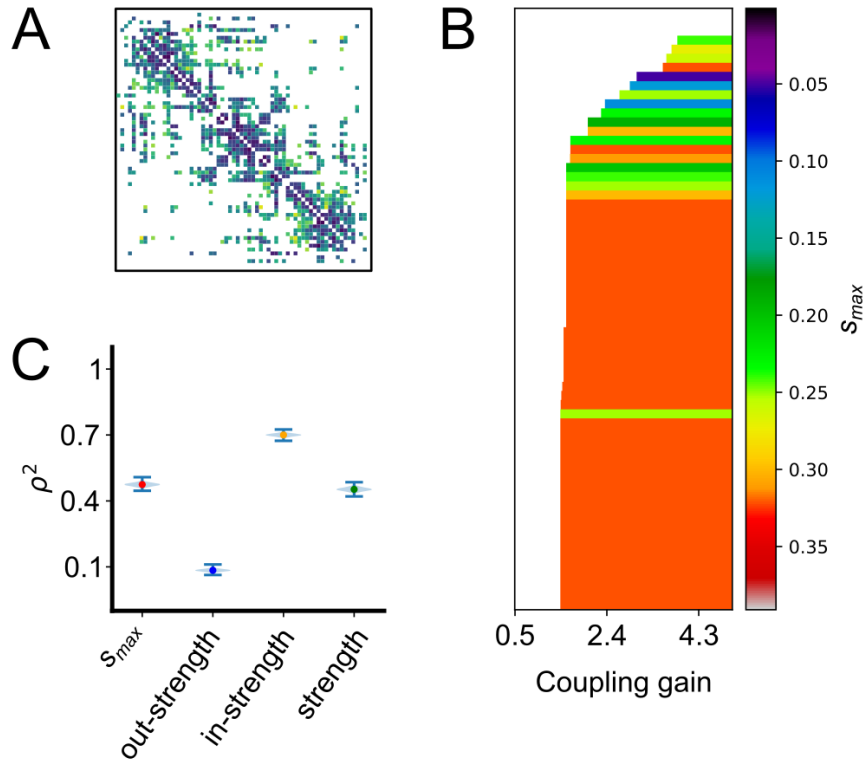
**Fig G. The ignited nodes and the  $k$ -core decomposition of the *Human*.**

(A) Number of ignited nodes ( $y$ -axis) (threshold  $R_i > 5$ ), as a function of coupling gain  $G$  ( $x$ -axis) in *Human* (red), *Human<sub>hw</sub>* (blue), one example of *DPR<sub>hw</sub>* (orange), and one example of *SW<sub>hw</sub>* (green). The inset shows the number of ignited at the  $G$  bifurcation, for *Human* and all the individual uSCs. (B)  $k$ -core decomposition of *Human*, *Human<sub>hw</sub>*, *DPR<sub>hw</sub>*, and *SW<sub>hw</sub>*. The  $y$ -axis shows the number of nodes in the shell, whereas the  $x$ -axis shows the minimum  $k_{max}$  inside that shell. The inset shows the largest  $k_{max}$ ,  $k_{max}$ -core, for *Human* and all the uSCs. The *Human* has the lowest degree ( $k_{max} = 11$ ) and largest  $k_{max}$ -core (53 regions, ~80.3% of network nodes).



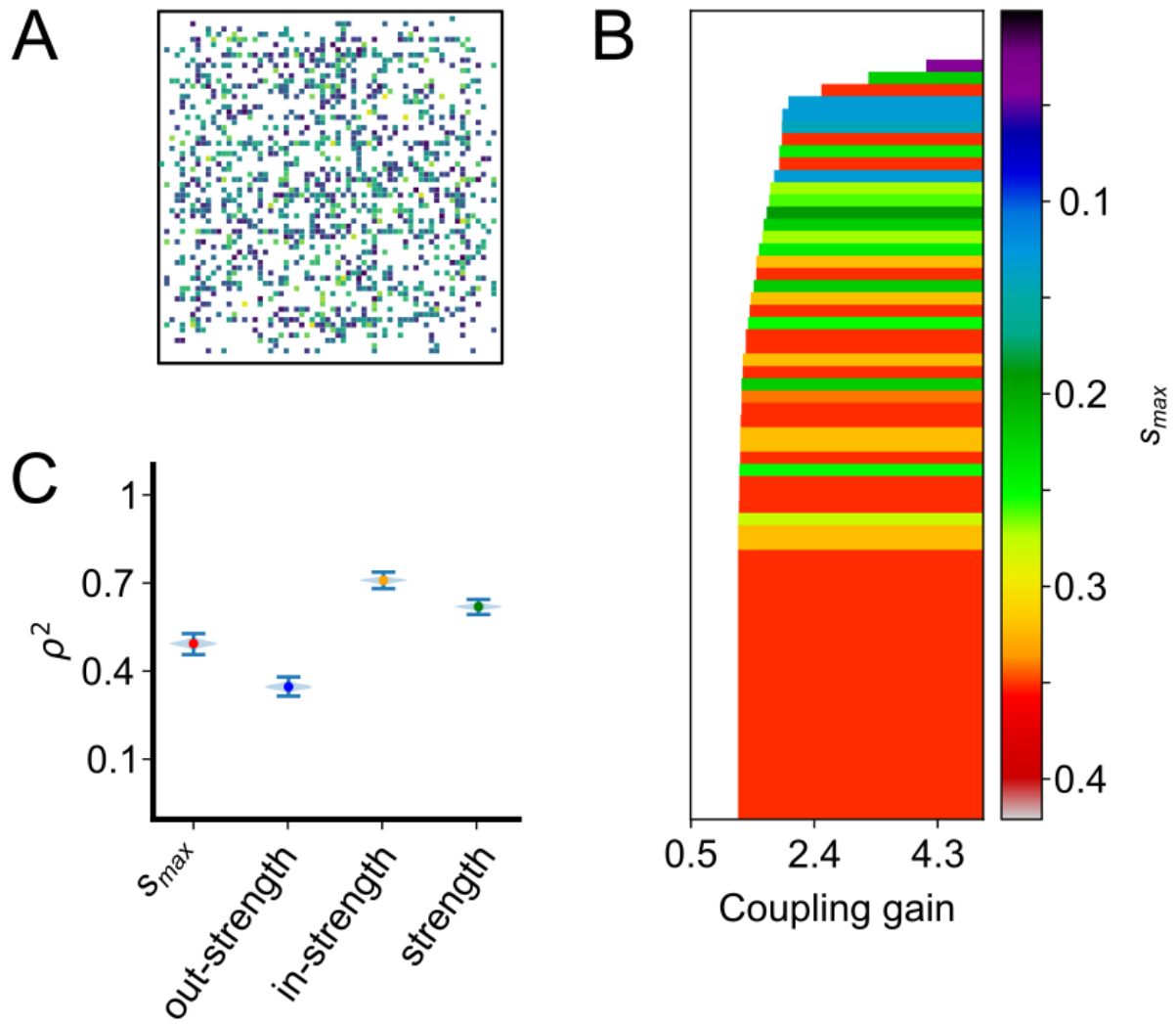
**Fig H.** The ignition,  $s_{max}$  and strength levels for each node in the *Human* connectome.

(A) The *Human* connectivity matrix. (B) The cortical areas (y-axis) were sorted by the coupling gain (x-axis) in which their first ignite. The colorbar shows the  $s_{max}$  value of each cortical area. (C) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at ignition of each node and its  $s_{max}$  (**0.867**); out-strength (**0.386**); in-strength (**0.671**), and strength (**0.687**). The significance of  $\rho^2$  was evaluated using 10.000 replicas from bootstrap resampling (the blue violin plots).



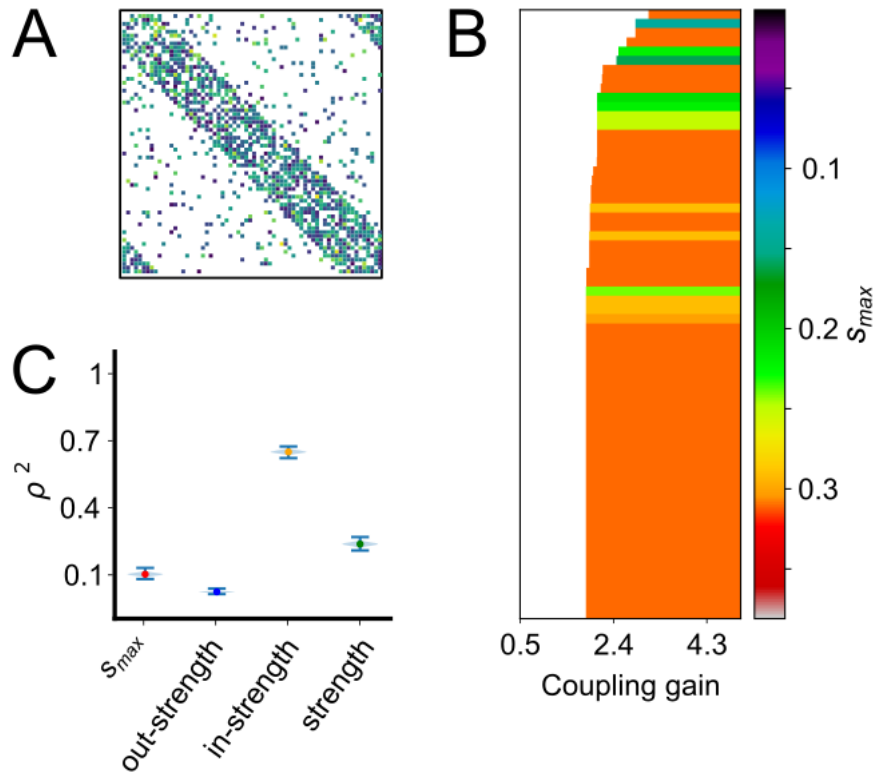
**Fig J. The ignition,  $s_{max}$  and strength levels for each node in the *Human<sub>rw</sub>* connectome.**

(A) The *Human<sub>rw</sub>* connectivity matrix. (B) The cortical areas ( $y$ -axis) were sorted by the coupling gain ( $x$ -axis) in which their first ignite. The colorbar shows the  $s_{max}$  value of each cortical area when they were ignited. (C) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at ignition of each node and its  $s_{max}$  (**0.474**); out-strength (**0.084**); in-strength (**0.700**), and strength (**0.453**). The significance of  $\rho^2$  was evaluated using 10,000 replicas from bootstrap resampling (the blue violin plots).



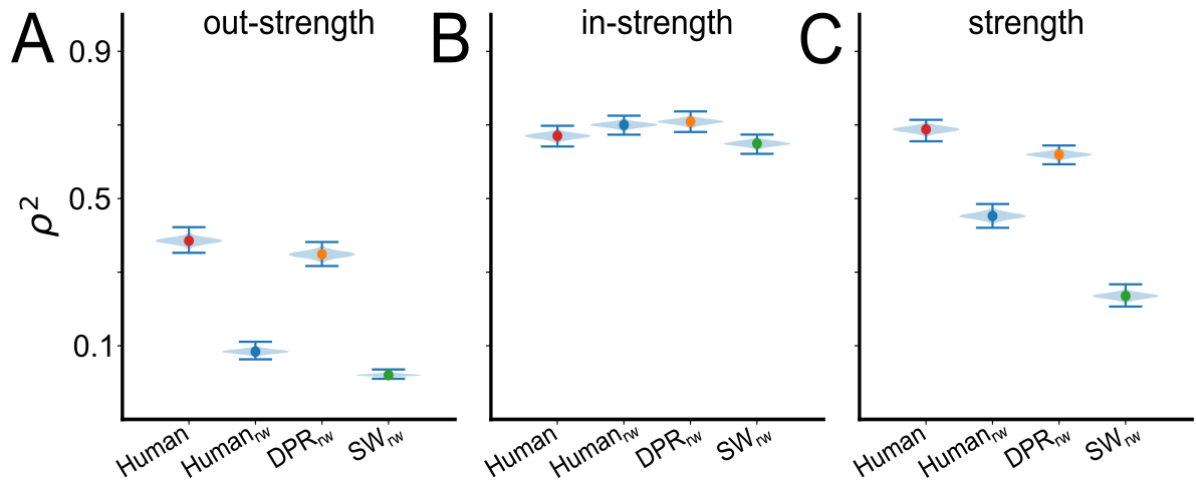
**Fig K.** The ignition,  $s_{max}$  and strength levels for each node in the  $DPR_{rw}$  connectome.

(A) The  $DPR_{rw}$  connectivity matrix. (B) The cortical areas (y-axis) were sorted by the coupling gain (x-axis) in which their first ignite. The colorbar shows the  $s_{max}$  value of each cortical area when were ignited. (C) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at ignition of each node and its  $s_{max}$  (**0.495**, red); out-strength (**0.348**, blue); in-strength (**0.709**, yellow), and strength (**0.620**, green). The significance of  $\rho^2$  was evaluated using 10.000 replicas from bootstrap resampling (the blue violin plots).



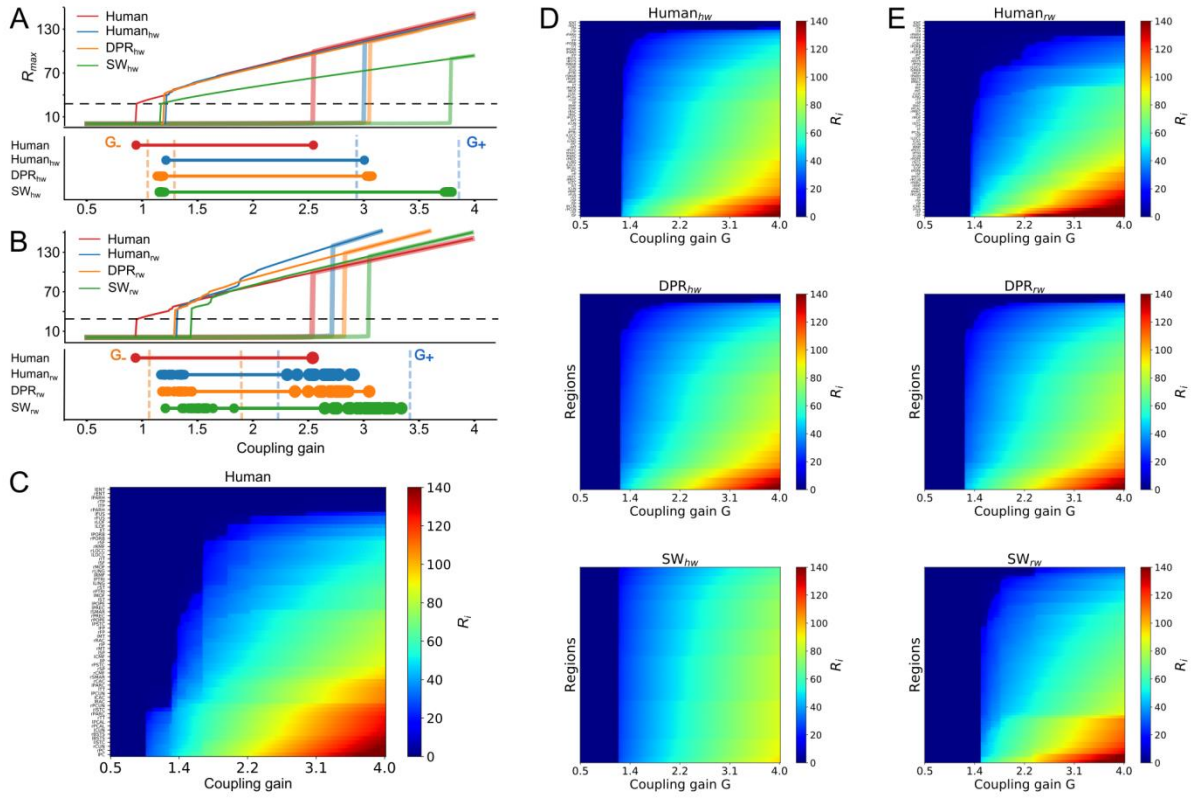
**Fig L. The ignition,  $s_{max}$  and strength levels for each node in the  $SW_{rw}$  connectome.**

(A) The  $SW_{rw}$  connectivity matrix. (B) The cortical areas (y-axis) were sorted by the coupling gain (x-axis) in which their first ignite. The colorbar shows the  $s_{max}$  value of each cortical area when were ignited. (C) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at ignition of each node and its  $s_{max}$  (**0.100**); out-strength (**0.021**); in-strength (**0.650**), and strength (**0.235**). The significance of  $\rho^2$  was evaluated using 10.000 replicas from bootstrap resampling (the blue violin plots).



**Fig M. Correlation between ignition order and strength for *Human* and wSCs.**

(A) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at the ignition of each node and its out-strength in *Human* (**0.386**), *Human<sub>rw</sub>* (**0.084**), *DPR<sub>rw</sub>* (**0.348**), and *SW<sub>rw</sub>* (**0.021**). (B) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at the ignition of each node and its in-strength in *Human* (**0.671**), *Human<sub>rw</sub>* (**0.700**), *DPR<sub>rw</sub>* (**0.709**), and *SW<sub>rw</sub>* (**0.650**). (C) Spearman rank correlation squared ( $\rho^2$ , shared variance) between the  $G$  value at ignition of each node and its strength in *Human* (**0.687**), *Human<sub>rw</sub>* (**0.453**), *DPR<sub>rw</sub>* (**0.620**), and *SW<sub>rw</sub>* (**0.235**). The significance of  $\rho^2$  was evaluated using 10.000 replicas from bootstrap resampling (the blue violin plots).



**Fig N. Overall  $R_{max}$  and  $R_i$  per region of the Human, uSCs, and wSCs ensembles.**

(A-B) Top,  $R_{max}$  versus coupling gain  $G$  in simulation starting either from High ICs ( $0.3 \leq S_i \leq 1$ ) or Low ICs ( $0 \leq S_i \leq 0.1$ ) for (A) Human and uSCs, and (B) Human and wSCs. At the bottom, the bifurcation points  $G_-$  and  $G_+$  for the corresponding ensembles. (C-E) Mean firing rate activity,  $R_i$  (colour bar) of each region  $i$  (y-axis) versus coupling gain  $G$  (x-axis) for the (C) Human, (D) uSCs ensembles, and (E) wSCs ensembles. The simulations started from High ICs ( $0.3 \leq S_i \leq 1$ ).