Supplementary Table 1

Name	Condition	Date	
Monkey A	awake	20130830	newly collected
Monkey A	awake	20130830	newly collected
Monkey A	awake	20140314	newly collected
Monkey A	awake	20140314	newly collected
Monkey J	awake	20120824	used previously in Barttfeld et al., 2015
Monkey J	awake	20120824	used previously in Barttfeld et al., 2015
Monkey J	awake	20120824	used previously in Barttfeld et al., 2015
Monkey J	awake	20120824	used previously in Barttfeld et al., 2015
Monkey J	awake	20120824	used previously in Barttfeld et al., 2015
Monkey J	awake	20120907	used previously in Barttfeld et al., 2015
Monkey J	awake	20120907	used previously in Barttfeld et al., 2015
Monkey J	awake	20120907	used previously in Barttfeld et al., 2015
Monkey J	awake	20120907	used previously in Barttfeld et al., 2015
Monkey J	awake	20120907	used previously in Barttfeld et al., 2015
Monkey J	awake	20120907	used previously in Barttfeld et al., 2015
Monkey J	awake	20120928	used previously in Barttfeld et al., 2015
Monkey J	awake	20121026	used previously in Barttfeld et al., 2015
Monkey J	awake	20121109	used previously in Barttfeld et al., 2015
Monkey J	awake	20121116	used previously in Barttfeld et al., 2015
Monkey J	awake	20121214	newly collected
Monkey J	awake	20121214	newly collected
Monkey J	awake	20130531	newly collected
Monkey K	awake	20121109	used previously in Barttfeld et al., 2015
Monkey K	awake	20121116	used previously in Barttfeld et al., 2015
Monkey K	awake	20121214	used previously in Barttfeld et al., 2015
Monkey K	awake	20130524	newly collected
Monkey K	awake	20130531	newly collected
Monkey K	awake	20140314	newly collected
Monkey K	awake	20140314	newly collected
Monkey K	awake	20140314	newly collected
Monkey K	awake	20150123	newly collected

Supplementary Table 2

Name	Condition	Date	
Monkey K	Deep ketamine anesthesia	20130209	newly collected
Monkey K	Deep ketamine anesthesia	20130209	newly collected
Monkey K	Deep ketamine anesthesia	20130308	newly collected
Monkey K	Deep ketamine anesthesia	20130308	newly collected
Monkey K	Deep ketamine anesthesia	20130322	newly collected
Monkey K	Deep ketamine anesthesia	20130322	newly collected
Monkey K	Deep ketamine anesthesia	20130412	newly collected
Monkey K	Deep ketamine anesthesia	20130412	newly collected
Monkey Ki	Deep ketamine anesthesia	20121130	newly collected
Monkey Ki	Deep ketamine anesthesia	20130215	newly collected
Monkey Ki	Deep ketamine anesthesia	20130215	newly collected
Monkey Ki	Deep ketamine anesthesia	20130302	newly collected
Monkey Ki	Deep ketamine anesthesia	20130302	newly collected
Monkey Ki	Deep ketamine anesthesia	20130323	newly collected
Monkey Ki	Deep ketamine anesthesia	20130323	newly collected
Monkey R	Deep ketamine anesthesia	20121123	newly collected
Monkey R	Deep ketamine anesthesia	20121123	newly collected
Monkey R	Deep ketamine anesthesia	20121130	newly collected
Monkey R	Deep ketamine anesthesia	20121207	newly collected
Monkey R	Deep ketamine anesthesia	20121207	newly collected
Monkey R	Deep ketamine anesthesia	20121221	newly collected
Monkey R	Deep ketamine anesthesia	20121221	newly collected
Monkey R	Deep ketamine anesthesia	20130125	newly collected
Monkey R	Deep ketamine anesthesia	20130125	newly collected
Monkey R	Deep ketamine anesthesia	20130719	newly collected

Supplementary Table 3

Name	Condition	Date	
Monkey J	Moderate sevoflurane sedation	20150821	newly collected
Monkey J	Moderate sevoflurane sedation	20150821	newly collected
Monkey J	Moderate sevoflurane sedation	20150821	newly collected
Monkey J	Moderate sevoflurane sedation	20160311	newly collected
Monkey J	Moderate sevoflurane sedation	20160311	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150710	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150710	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150710	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150710	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150710	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150724	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150724	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150724	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150724	newly collected
Monkey Ki	Moderate sevoflurane sedation	20150724	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150626	newly collected
Monkey R	Moderate sevoflurane sedation	20150717	newly collected
Monkey R	Moderate sevoflurane sedation	20150717	newly collected
Monkey R	Moderate sevoflurane sedation	20150717	newly collected

Supplementary Table 4

Name	Condition	Date	
Monkey J	Deep sevoflurane anesthesia	20150821	newly collected
Monkey J	Deep sevoflurane anesthesia	20160311	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20150710	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20150724	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20150724	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20150724	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20150724	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20150724	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20160708	newly collected
Monkey Ki	Deep sevoflurane anesthesia	20160708	newly collected
Monkey R	Deep sevoflurane anesthesia	20150626	newly collected
Monkey R	Deep sevoflurane anesthesia	20150626	newly collected
Monkey R	Deep sevoflurane anesthesia	20150626	newly collected
Monkey R	Deep sevoflurane anesthesia	20150717	newly collected
Monkey R	Deep sevoflurane anesthesia	20150717	newly collected
Monkey R	Deep sevoflurane anesthesia	20150717	newly collected
Monkey R	Deep sevoflurane anesthesia	20150717	newly collected
Monkey R	Deep sevoflurane anesthesia	20160805	newly collected
Monkey R	Deep sevoflurane anesthesia	20160805	newly collected
Monkey R	Deep sevoflurane anesthesia	20160805	newly collected

Supplementary Table 5

Name	Condition	Date	
Monkey J	Moderate propofol sedation	20120421	used previously in Barttfeld et al., 2015
Monkey J	Moderate propofol sedation	20120421	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120420	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120420	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120427	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120427	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120608	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120608	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120623	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120629	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120629	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120720	used previously in Barttfeld et al., 2015
Monkey K	Moderate propofol sedation	20120720	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120414	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120420	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120420	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120505	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120505	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120608	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120608	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120623	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120629	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120629	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120720	used previously in Barttfeld et al., 2015
Monkey R	Moderate propofol sedation	20120720	used previously in Barttfeld et al., 2015

Supplementary Table 6

Name	Condition	Date	
Monkey J	Deep propofol anesthesia	20120106	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120302	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120302	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120316	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120316	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120323	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120323	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120413	used previously in Barttfeld et al., 2015
Monkey J	Deep propofol anesthesia	20120413	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120128	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120128	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120202	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120202	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120302	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120302	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120324	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120324	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120413	used previously in Barttfeld et al., 2015
Monkey K	Deep propofol anesthesia	20120413	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20110722	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20110722	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20111217	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20111217	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120107	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120107	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120310	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120310	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120316	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120316	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120323	used previously in Barttfeld et al., 2015
Monkey R	Deep propofol anesthesia	20120323	used previously in Barttfeld et al., 2015

Supplementary Table 7: Number and name of the 82 ROIs

	Region Number	Region Name
Left Hemisphere	**1**	Templar polar cortex
	2	Superior temporal cortex
	3	Amygdala
	4	Orbito-inferior prefrontal cortex
	5	Anterior insula
	6	Orbito-medial prefrontal cortex
	7	Central temporal cortex
	8	Orbitol-ateral prefrontal cortex
	9	Inferior temporal
	10	Parahippocampal cortex
	11	Gustatory cortex
	12	Ventro-lateral premotor cortex
	13	Anterior visual area (ventral)
	14	Posterior insula
	15	Prefrontal polar cortex
	16	Hippocampus
	17	Subgenual cingulate cortex
	18	Ventrolateral prefrontal cortex
	19	Visual area 2
	20	Medial prefrontal cortex
	21	Ventral temporal cortex
	22	Anterior visual area (dorsal)
	23	Visual area 1
	24	Centrolateral prefrontal cortex
	25	Secondary auditory cortex
	26	Retrosplenial cingulate cortex
	27	Posterior cingulate cortex
	28	Anterior cingulate cortex
	29	Secondary somatosensory cortex
	30	Primary somatosensory cortex
	31	Primary auditory cortex
	32	Primary motor cortex
	33	Inferior parietal cortex
	34	Medial parietal cortex
	35	Dorsomedial prefrontal cortex
	36	Intraparietal cortex
	37	Superior parietal cortex
	38	Frontal eye fields
	39	Dorso-lateral prefrontal cortex
	40	Medial premotor cortex
	41	Dorso-lateral premotor cortex
Right Hemisphere	**42**	Templar polar
	43	Superior temporal cortex
	44	Amygdala
	45	Orbito-inferior prefrontal cortex
	46	Anterior insula
	47	Orbito-medial prefrontal cortex
	48	Central temporal cortex
	49	Orbito-lateral prefrontal cortex
	50	Inferior temporal
	51	Parahippocampal cortex
	52	Gustatory cortex
	53	Ventro-lateral premotor cortex
	54	Anterior visual area (ventral)
	55	Posterior insula
	56	Prefrontal polar cortex
	57	Hippocampus
	58	Subgenual cingulate cortex
	59	Ventro-lateral prefrontal cortex
	60	Visual area 2
	61	Medial prefrontal cortex
	62	Ventral temporal cortex
	63	Anterior visual area (dorsal)
	64	Visual area 1
	65	Centrolateral prefrontal cortex
	66	Secondary auditory cortex
	67	Retrosplenial cingulate cortex
	68	Posterior cingulate cortex
	69	Anterior cingulate cortex
	70	Secondary somatosensory cortex
	71	Primary somatosensory cortex
	72	Primary auditory cortex
	73	Primary motor cortex
	74	Inferior parietal cortex
	75	Medial parietal cortex
	76	Dorsomedial prefrontal cortex
	77	Intraparietal cortex
	78	Superior parietal cortex
	79	Frontal eye fields
	80	Dorso-lateral prefrontal cortex
	81	Medial premotor cortex
	82	Dorso-lateral premotor cortex

Supplementary Table 8: Physiological data under anesthesia

oxygen saturation (SpO_2); systolic (SAP), diastolic (DAP) and mean blood pressure (MAP); respiration rate; end-tidal CO_2 ($EtCO_2$); temperature (°C)

Deep Ketamine Anesthesia	Heart Rate	SpO2	SAP	DAP	MAP	Respiration Rate	EtCO2	Temperature (°C)
All monkeys	144 +/- 2	98 +/- 2	127 +/- 16	79 +/-15	103 +/- 16	31 +/-4	42 +/-2	37,5 +/-0,3
Monkey R	155 +/- 8	98 +/- 2	129 +/-15	77 +/- 11	98 +/- 14	33 +/- 5	42 +/- 2	37,6 +/-0,3
Monkey K	140 +/- 8	98 +/- 1	140 +/- 3	95 +/- 3	121 +/- 5	33 +/- 1	42 +/- 1	37,5 +/- 0,4
Monkey Ki	133 +/- 8	99 +/- 1	112 +/- 13	69 +/-6	91 +/- 6	29 +/- 3	41 +/- 2	37,5 +/- 0,3

Moderate Sevoflurane Sedation	Heart Rate	SpO2	SAP	DAP	MAP	Respiration Rate	EtCO2	Temperature (°C)
All monkeys	102 +/- 11	98 +/- 2	94 +/- 15	42 +/- 6	65 +/- 10	20 +/- 2	40 +/- 1	38,5 +/- 0,3
Monkey R	104 +/- 2	96 +/- 2	92 +/-5	40 +/- 3	62 +/- 3	20 +/- 1	41 +/- 1	38,6 +/- 0,4
Monkey Ki	108 +/- 13	99 +/-0	99 +/- 22	44 +/- 7	68 +/- 15	19 +/- 2	40 +/- 1	38,7 +/- 0,2
Monkey J	92 +/- 8	99 +/- 0	90 +/- 10	41 +/- 6	65 +/- 6	21 +/- 2	39 +/- 1	38,3 +/- 0,3

Deep Sevoflurane Anesthesia	Heart Rate	SpO2	SAP	DAP	MAP	Respiration Rate	EtCO2	Temperature (°C)
All monkeys	105 +/- 13	99 +/- 1	89 +/- 13	42 +/- 6	60 +/- 8	19 +/- 3	40 +/- 1	38,2 +/- 0,3
Monkey R	102 +/- 14	98 +/- 1	83 +/- 14	41 +/- 3	56 +/- 7	20 +/-3	40 +/- 1	38,3 +/- 0,4
Monkey Ki	116 +/- 5	99 +/- 0	95 +/- 13	45 +/- 9	64 +/- 10	19 +/- 3	41 +/- 1	38,0 +/- 0,1
Monkey J	95 +/- 7	99 +/-1	87 +/- 6	41 +/- 5	59 +/- 5	18 +/- 1	40 +/- 0	38,3 +/- 0,3

Moderate Propofol Anesthesia	Heart Rate	SpO2	SAP	DAP	MAP	Respiration Rate	EtCO2	Temperature (°C)
All monkeys	140 +/- 12	98 +/- 1	121 +/- 14	63 +/- 13	93 +/- 15	24 +/-2	43 +/- 2	37,6 +/- 0,3
Monkey R	142 +/- 7	99 +/- 1	118 +/- 12	58 +/- 14	86 +/- 15	24 +/- 1	42 +/- 2	37,6 +/- 0,3
Monkey K	145 +/- 7	98 +/- 2	131 +/- 8	72 +/- 10	105 +/- 9	25 +/- 1	43 +/- 2	37,5 +/- 0,3
Monkey J	109 +/- 1	99 +/- 0	102 +/- 1	54 +/- 1	88 +/- 15	20 +/- 1	41 +/- 0	37,6 +/- 0,4

Deep Propofol Anesthesia	Heart Rate	SpO2	SAP	DAP	MAP	Respiration Rate	EtCO2	Temperature (°C)
All monkeys	137 +/- 15	97 +/- 2	110 +/- 19	58 +/- 13	84 +/- 17	24 +/- 5	42 +/- 3	37,6 +/- 0,2
Monkey R	146 +/- 6	96 +/- 3	120 +/- 10	64 +/- 12	91 +/- 9	23 +/- 6	42 +/- 3	37,6 +/- 0,3
Monkey K	149 +/- 9	97 +/- 2	120 +/- 11	61 +/- 12	93 +/- 10	27 +/- 4	42 +/- 3	37,5 +/- 0,4
Monkey J	120 +/- 9	96 +/- 3	93 +/- 17	51 +/ 12	69 +/- 17	22 +/- 4	42 +/- 2	37,5 +/- 0,2

Supplementary Table 9:

Moderate Sevoflurane Sedation	Dosage	Monkey Behavior Scale	EEG
Monkey R	Sevoflurane I/E: 2,2 vol% (+/- 0,1) / 2,1 vol% (+/- 0,1)	Level 3: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch + corneal reflex +	Level 3: increased frontal delta alpha and beta waves
Monkey Ki	Sevoflurane I/E: 2,2 vol% (+/- 0,1) / 2,1 vol% (+/- 0,1)	Level 3: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch + corneal reflex +	Level 3: increased frontal delta alpha and beta waves
Monkey J	Sevoflurane I/E: 2,2 vol% (+/- 0,1) / 2,1 vol% (+/- 0,1)	Level 3: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch + corneal reflex +	Level 3: increased frontal delta alpha and beta waves

Moderate Propofol Sedation	Dosage	Monkey Behavior Scale	EEG
Monkey R	3,7 microgr/ml	Level 3: spontaneous movements - response to juice presentation - shaking/prodding + toe pinch + corneal reflex +	Level 3: diffuse and wide alpha waves, anterior theta waves
Monkey K	4 microgr/ml	Level 3: spontaneous movements - response to juice presentation - shaking/prodding + toe pinch + corneal reflex +	Level 3: diffuse and wide alpha waves, anterior theta waves
Monkey J	3,7 microgr/ml	Level 3: spontaneous movements - response to juice presentation - shaking/prodding + toe pinch + corneal reflex +	Level 3: diffuse and wide alpha waves, anterior theta waves

Monkey **behavior (**sedation) scale (Uhrig et al., 2016), EEG and anesthetic dosage for each monkey under moderate sevoflurane sedation (Monkeys R, Ki, J)
and moderate propofol sedation (Monkeys R, K, J).

Supplementary Table 10:

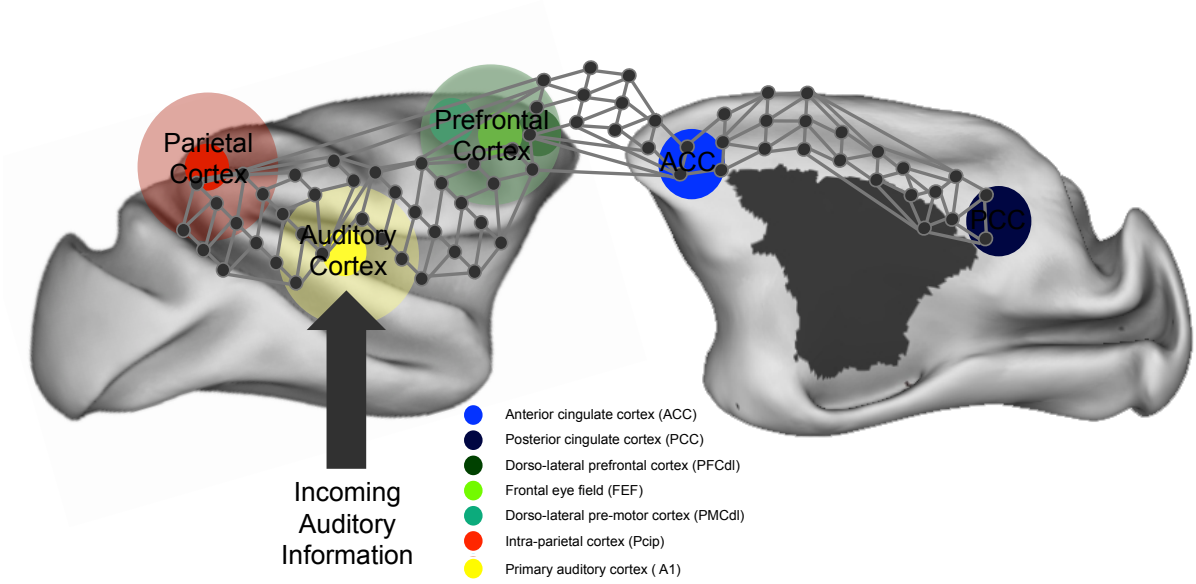
Monkey **behavior (**sedation) scale (Uhrig et al., 2016), EEG and anesthetic dosage for each monkey under ketamine (Monkeys R, Ki, K), deep sevoflurane (Monkeys R, Ki, J) and deep propofol anesthesia sedation (Monkeys R, K, J).

Deep Ketamine Anesthesia	Dosage	Monkey Behavior Scale	EEG
Monkey R	15 mg/kg/h	Level 4: spontaneous movements - response to juice presentation – shaking/prodding - toe pinch - corneal reflex -	Level 4: delta activity of large amplitude, beta activity of low amplitude,
Monkey Ki	16 mg/kg/h	Level 4: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch - corneal reflex -	Level 4: delta activity of large amplitude, beta activity of low amplitude,
Monkey K	16 mg/kg/h	Level 4: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch - corneal reflex -	Level 4: delta activity of large amplitude, beta activity of low amplitude,

Deep Sevoflurane Anesthesia	Dosage	Monkey Behavior Scale	EEG
Monkey R	Sevoflurane I/E: 4,4 vol% +/- 0,1 /4,0 vol% +/- 0,1	Level 4: spontaneous movements - response to juice presentation – shaking/prodding - toe pinch - corneal reflex -	Level 4: diffuse delta waves anterior alpha waves
Monkey Ki	Sevoflurane I/E: 4,4 vol% +/- 0,1 /4,1 vol% +/- 0,1	Level 4: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch - corneal reflex -	Level 4: diffuse delta waves anterior alpha waves
Monkey J	Sevoflurane I/E: 4,4 vol% +/- 0,1 /4,0 vol% +/- 0,1	Level 4: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch - corneal reflex -	Level 4: diffuse delta waves anterior alpha waves

Deep Propofol Anesthesia	Dosage	Monkey Behavior Scale	EEG
Monkey R	5,8 microgr/ml	Level 4: spontaneous movements - response to juice presentation – shaking/prodding - toe pinch - corneal reflex -	Level 4: diffuse delta waves waves of low amplitude anterior alpha waves
Monkey K	5,6-5,9 microgr/ml	Level 4: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch - corneal reflex -	Level 4: diffuse delta waves waves of low amplitude anterior alpha waves
Monkey J	6,5-7,2 microgr/ml	Level 4: spontaneous movements - response to juice presentation - shaking/prodding - toe pinch - corneal reflex -	Level 4: diffuse delta waves waves of low amplitude anterior alpha waves

Supplementary Figure 1: Macaque Global Neuronal Workspace nodes and auditory cortex

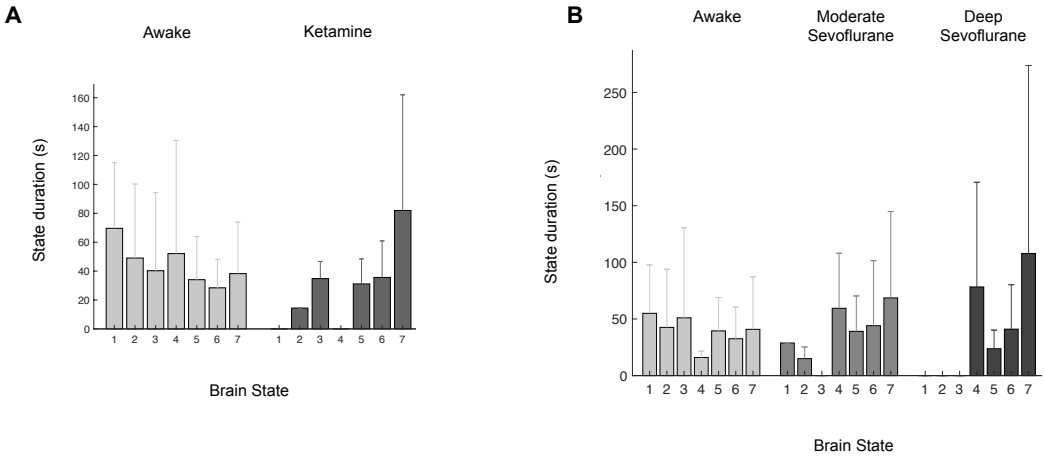


<u>Supplementary Figure 1:</u> Schematic representation of the macaque Global Neuronal Workspace nodes.

Schematic representation of an incoming auditory stimuli to the auditory cortex.

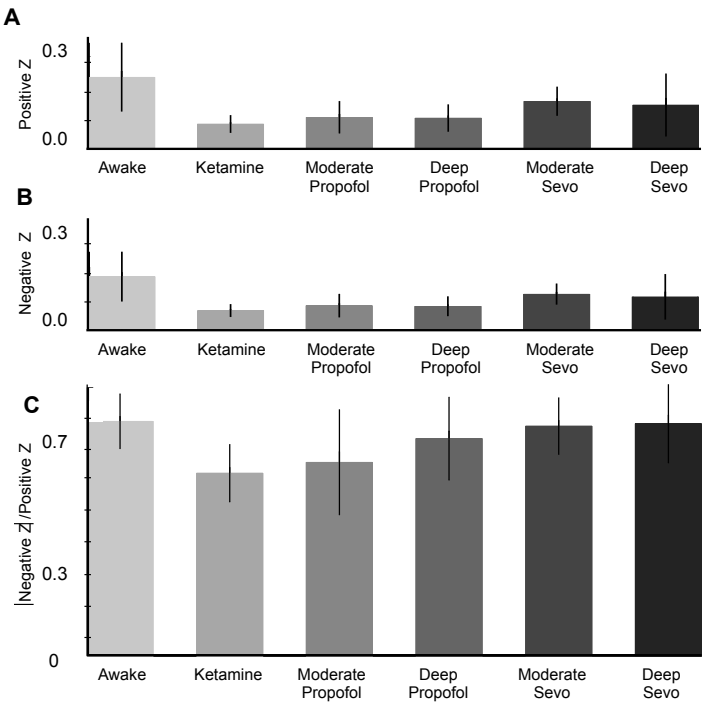
Sensory stimuli (as in this example the auditory information) become conscious when the information becomes available to a large brain network composed of cortico-cortical long-range connections (grey) in the pre-frontal (green), parietal (red), temporal (yellow) and cingulate (blue) cortex (Dehaene S et al, PNAS, 1998).

Supplementary Figure 2: Average lifetime of brain states



<u>Supplementary Figure 2:</u>
Average lifetime of brain states
(A) Average lifetime of brain states for the awake state and ketamine anesthesia. *(B)* Average lifetime of brain states for the awake state and sevoflurane (moderate, deep) anesthesia. Error bars stand for SD.

Supplementary Figure 3: Stationary functional correlations, Awake state and Anesthesia

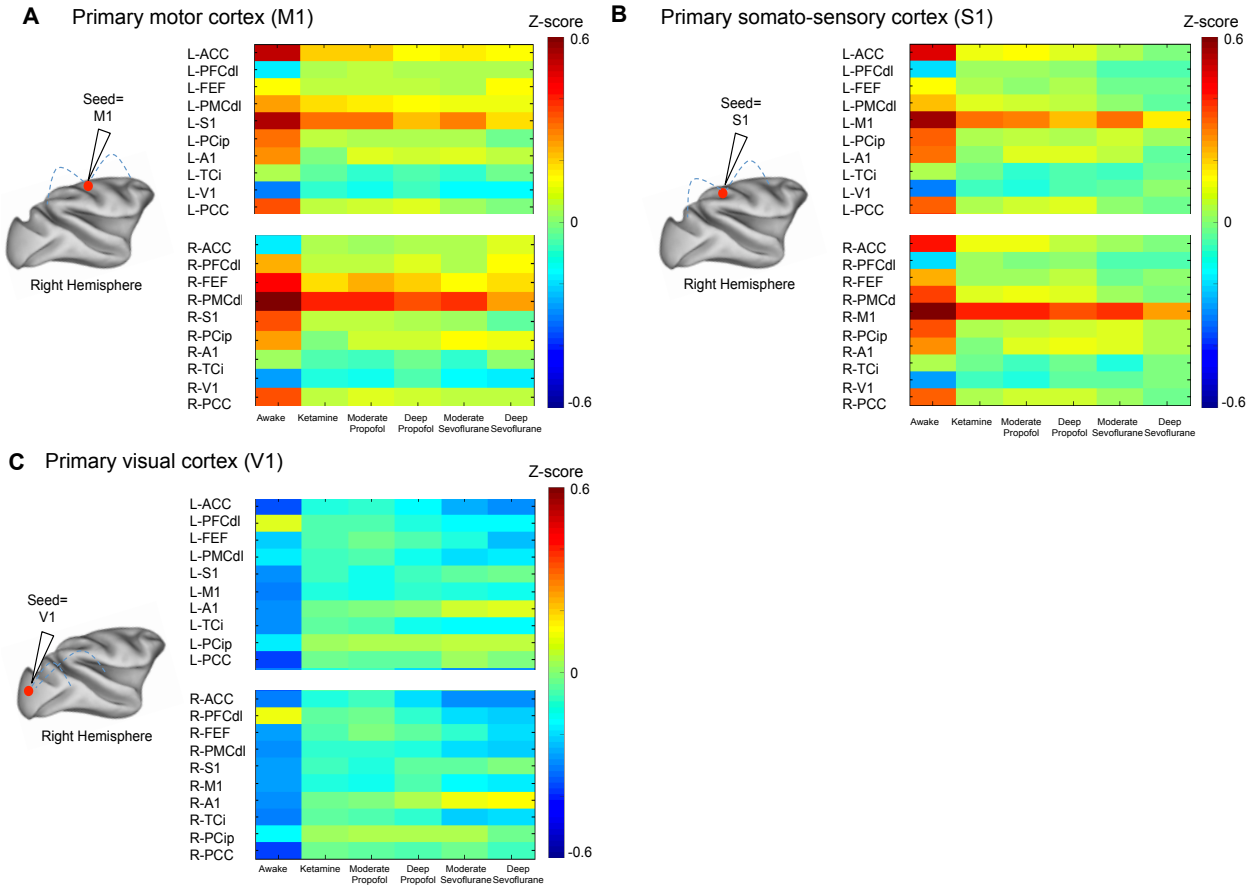


Supplementary Figure 3:

Stationary functional correlations across consciousness levels

(A) Average positive z-values within the awake state, under ketamine (deep), propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia. (*B*) Average negative z-values the awake state, under ketamine (deep), propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia. *(C) R*atio of negative to positive correlations in the awake state, under ketamine (deep), propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia. In all plots, error bars represent SD.

Supplementary Figure 4 : Changes in stationary functional correlations between sensori-motor areas and the Global Neuronal Workspace nodes in the awake state and under anesthesia



Supplementary Figure 4:

Changes in stationary functional correlations between sensori-motor areas and Global Neuronal Workspace nodes in the awake state and under anesthesia. Average correlations matrices for the awake state, ketamine anesthesia, moderate propofol sedation, deep propofol anesthesia, moderate and deep sevoflurane anesthesia ($P < 0.001$, FDR corrected). On the x-axis, arousal states. On the y-axis, studied regions connected to the seed.

(A) Anesthesia modifies primary motor cortex (M1) correlations to other cerebral regions (L-ACC, PFCdl, FEF, PMCdl, S1, PCip, A1, TCi, V1, PCC of the left (L) and right (R) hemisphere). Seed in M1 in the right hemisphere.

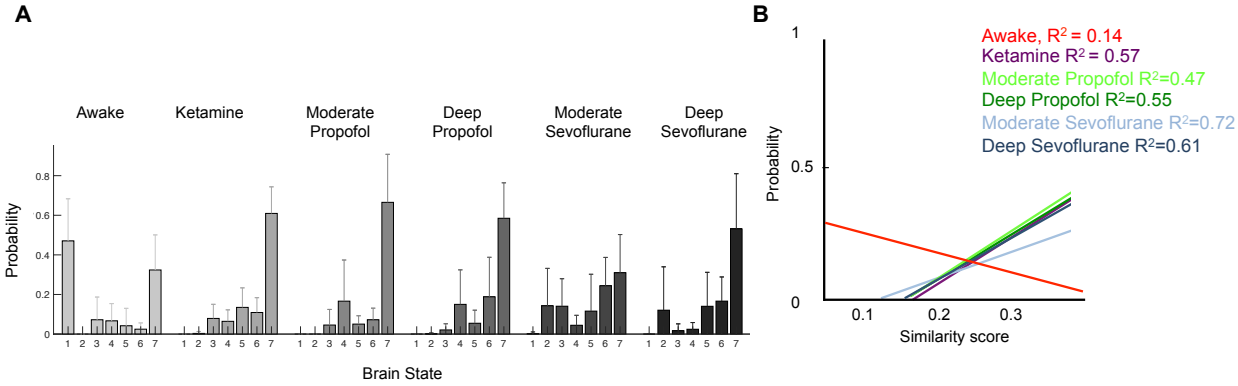
(B) Anesthesia modifies primary somatosensory cortex (S1) correlations to other cerebral regions (ACC, PFCdl, FEF, PMCdl, M1, PCip, A1, TCi, V1, PCC of the left (L) and right (R) hemisphere). Seed in S1 in the right hemisphere.

(C) Anesthesia modifies visual area 1 (V1) correlations to other cerebral regions (ACC, PFCdl, FEF, PMCdl, S1, M1, A1, TCi, PCip, PCC of the left (L) and right (R) hemisphere). Seed in V1 in the right hemisphere.

Anterior cingulate cortex (ACC ; Dorsolateral prefrontal cortex (PFCdl) ; Frontal eye fields (FEF) ; Dorsolateral premotor cortex (PMCdl) ; Primary somatosensory cortex (S1) ; Primary motor cortex (M1) ; Intraparietal cortex (Pcip), Primary auditory cortex (A1) ; Amygdala (Amyg) , Inferior temporal (TCi), Visual area 1 (V1) ; Posterior cingulate cortex (PCC).

Supplementary Figure 5: Changes in dynamical correlations

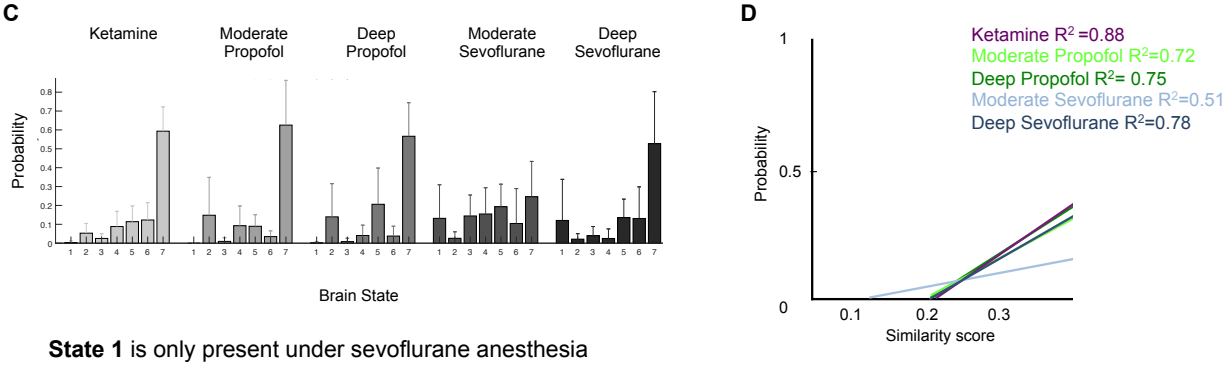
Changes in dynamical correlations and brain states induced by anesthetics and the awake state



State 1 only exists in the awake state

State 7 is predominant under all anesthetitics

Changes in dynamical correlations and brain states induced by anesthetics
(clustering without the awake state)



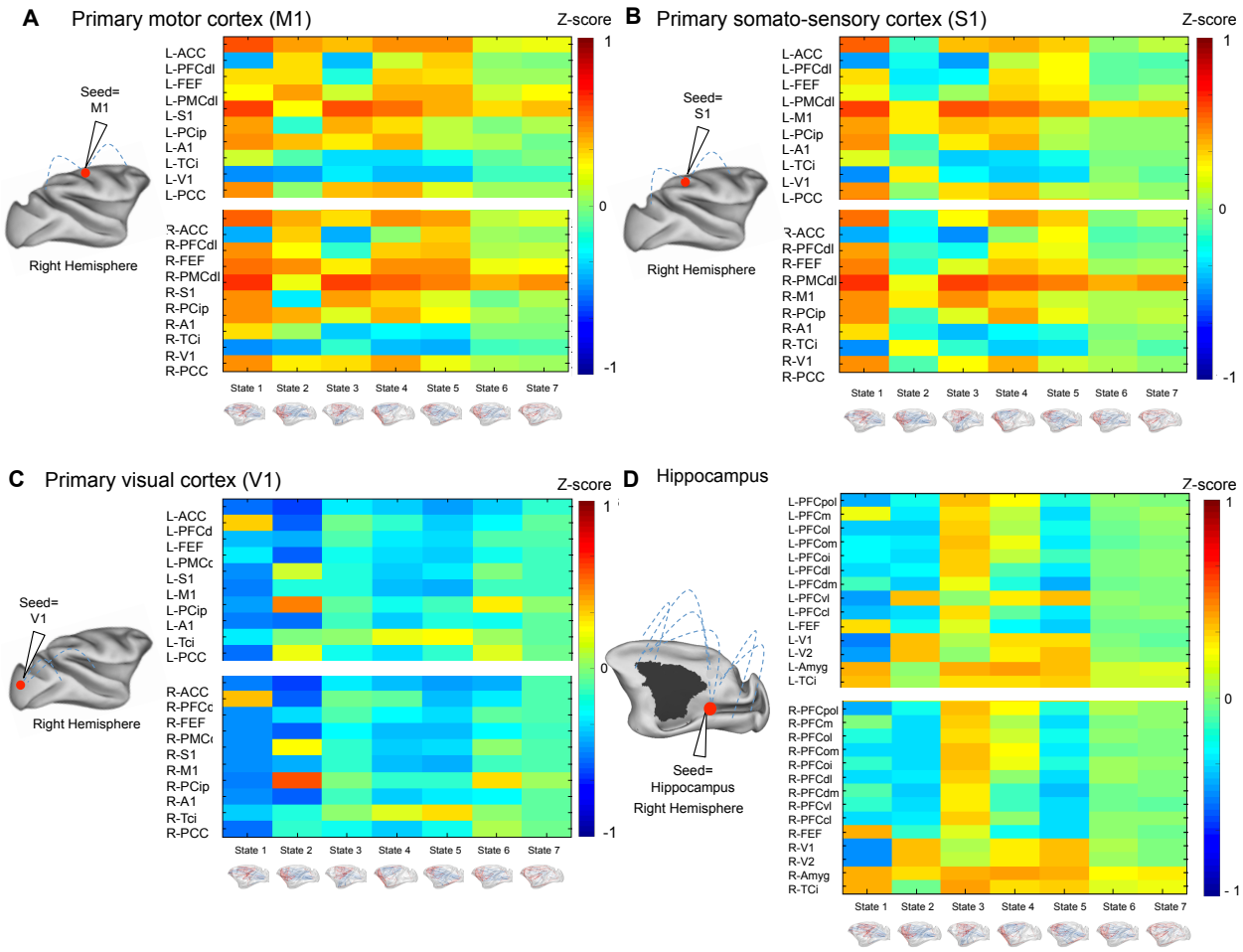
State 1 is only present under sevoflurane anesthesia

State 7 is predominant under all anesthetitics

Supplementary Figure 5:
Changes in dynamical correlations
Changes in dynamical correlations and brain states induced by anesthetics and the awake state. *(A)* Probability distributions of brain states for the awake state, ketamine (deep), propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia. Each bar represents the within-condition probability of occurrence of a state. Error bars stand for SD. *(B)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for the awake state, ketamine (deep), propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia.
State 1 only exists in the awake state. **State 7** is predominant under all anesthetics.

Changes in dynamical correlations and brain states induced by anesthetics (without the awake state). *(C)* Probability distributions of brain states for the ketamine anesthesia, propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia. Each bar represents the within-condition probability of occurrence of a state. Error bars stand for SD. *(D)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for ketamine, propofol (moderate, deep) and sevoflurane (moderate, deep) anesthesia.
State 1 is only present under sevoflurane anesthesia. **State 7** is predominant under all anesthetics
For the dynamic correlations analysis, in which we included only the anesthesia data, without the awake state, brain state 1 is only present under sevoflurane anesthesia (ANOVA mean rank: ketamine anesthesia = 6.00 (S.D. 0.35); moderate propofol anesthesia = 5.73 (S.D. 1.08), deep propofol anesthesia = 5.69 (S.D. 0.76); moderate sevoflurane sedation = 4.55 (S.D. 1.13), deep sevoflurane anesthesia = 5.53 (S.D. 1.47); $F(4,117)=5.61$, $P<10\text{-}3$) and brain state 7 is dominant under all anesthetics (ANOVA mean rank similarity; mean rank: ketamine anesthesia = 0.32 (S.D. 0.01); moderate propofol anesthesia = 0.32 (S.D. 0.03), deep propofol anesthesia = 0.32 (S.D. 0.02), moderate sevoflurane sedation = 0.28 (S.D. 0.03), deep sevoflurane anesthesia = 0.31 (S.D. 0.04) ; $F(4,117) = 7.57$, $P<10^{-4}$)

Supplementary Figure 6: Changes in dynamical correlations for the 7 states, Awake and Anesthesia



Supplementary Figure 6:

Changes in dynamical correlations for the 7 states in the awake state and under anesthesia. The seven brain states, obtained by unsupervised clustering of the $Z_{c,s,w}$ matrix and brain states are sorted according to their similarity to the structural connectivity matrix (brain state 1 to brain state 7). Average correlations matrices for every brain state, ordered from 1 to 7. On the x-axis, brain state 1 to 7. On the y-axis, studied regions connected to the seed.

(A) Changes in primary motor cortex (M1) correlations to other cerebral regions (L-ACC, PFCdl, FEF, PMCdl, S1, PCip, A1, TCi, V1, PCC of the left (L) and right (R) hemisphere) in the 7 brain states. Seed in M1 in the right hemisphere.

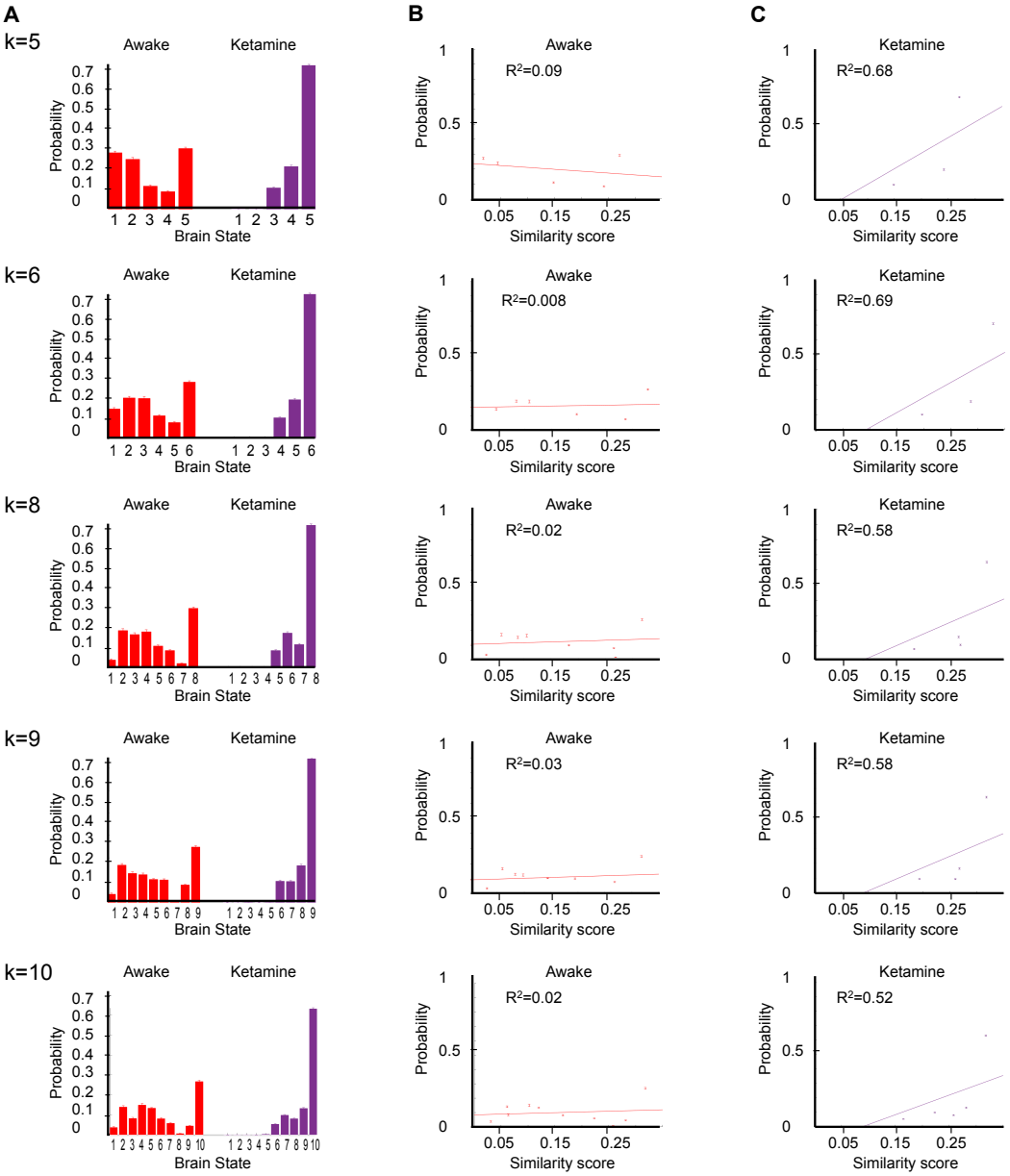
(B) Changes primary somatosensory cortex (S1) correlations to other cerebral regions (ACC, PFCdl, FEF, PMCdl, M1, PCip, A1, TCi, V1, PCC of the left (L) and right (R) hemisphere) in the 7 brain states. Seed in PFCdl in the right hemisphere.

(C) Changes in in modifies visual area 1 (V1) correlations to other cerebral regions (ACC, PFCdl, FEF, PMCdl, S1, M1, A1, TCi, PCip, PCC of the left (L) and right (R) hemisphere) in the 7 brain states. Seed in V1 in the right hemisphere.

(D) Changes in hippocampal correlations to other cerebral regions (PFCpol, PFCm, PFCol, PFCom, PFCoi, PFCdl, PFCdm, PFCvl, PFCcl, FEF, V1, V2, Amyg, TCi of the left (L) and right (R) hemisphere) in the 7 brain states. Seed in hippocampus in the right hemisphere.

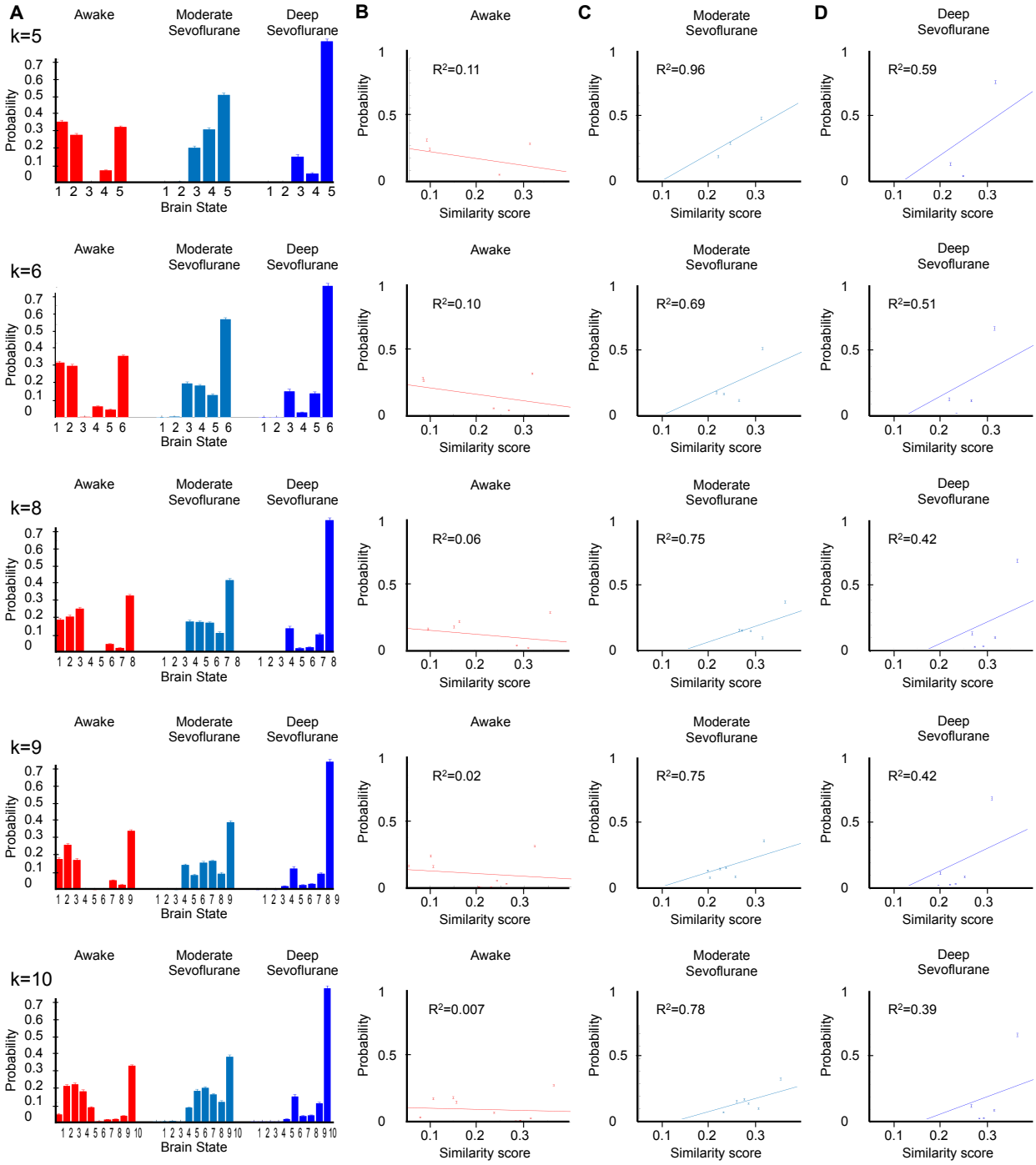
Anterior cingulate cortex (ACC) ; Prefrontal polar cortex (PFCpol) ; Medial prefrontal cortex (PFCm) ; Prefrontal polar cortex (PFCol); Orbitomedial prefrontal cortex (PFCom) ; Orbitoinferior prefrontal cortex (PFCoi) ; Dorsolateral prefrontal cortex (PFCdl) ; Dorsomedial prefrontal cortex (PFCdm) ; Ventrolateral prefrontal cortex (PFCvl) ; Centrolateral prefrontal cortex (PFCcl), Frontal eye fields (FEF) ; Dorsolateral premotor cortex (PMCdl) ; Primary somatosensory cortex (S1) ; Primary motor cortex (M1) ; Intraparietal cortex (Pcip), Primary auditory cortex (A1) ; Amygdala (Amyg) , Inferior temporal (TCi), Visual area 1 (V1) ; Visual area 2 (V2) ; Posterior cingulate cortex (PCC).

Supplementary Figure 7: Changes in dynamical correlations, Awake/Ketamine



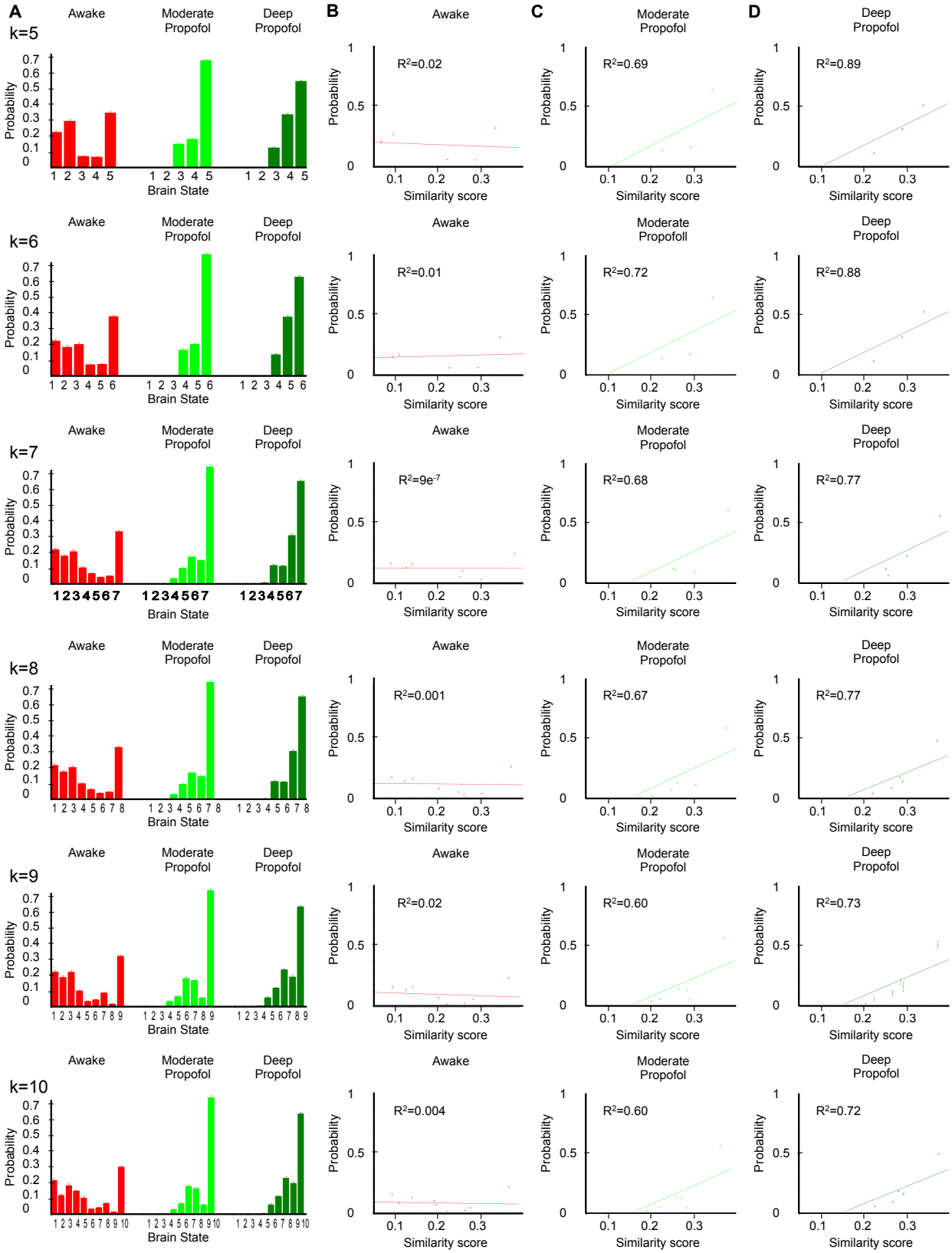
<u>Supplementary Figure 7:</u> Changes in dynamical correlations, Awake/Ketamine
To explore the dependence of results on the parameter k (number of predefined brain states), a wide range of k values [5, 6, 7, 8, 9, 10] was explored for the awake state and ketamine anesthesia (main text shows results for k = 7) *(A)* Probability distributions of brain states for the awake state and ketamine anesthesia. Each bar represents the within-condition probability of occurrence of a state. Error bars stand for SEM. *(B)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for the awake state. *(C)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for ketamine anesthesia.

Supplementary Figure 8: Changes in dynamical correlations, Awake/Sevoflurane



<u>Supplementary Figure 8:</u> Changes in dynamical correlations, Awake/Sevoflurane
To explore the dependence of results on the parameter k (number of predefined brain states), a wide range of k values [5, 6, 7, 8, 9, 10] was explored for the awake state and sevoflurane anesthesia (main text shows results for k = 7) *(A)* Probability distributions of brain states for the awake state, moderate and deep sevoflurane anesthesia (at least 60 min after the initial ketamine injection). Each bar represents the within-condition probability of occurrence of a state. Error bars stand for SEM. *(B)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for the awake state. *(C)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for moderate sevoflurane anesthesia. *(D)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for deep sevoflurane anesthesia.

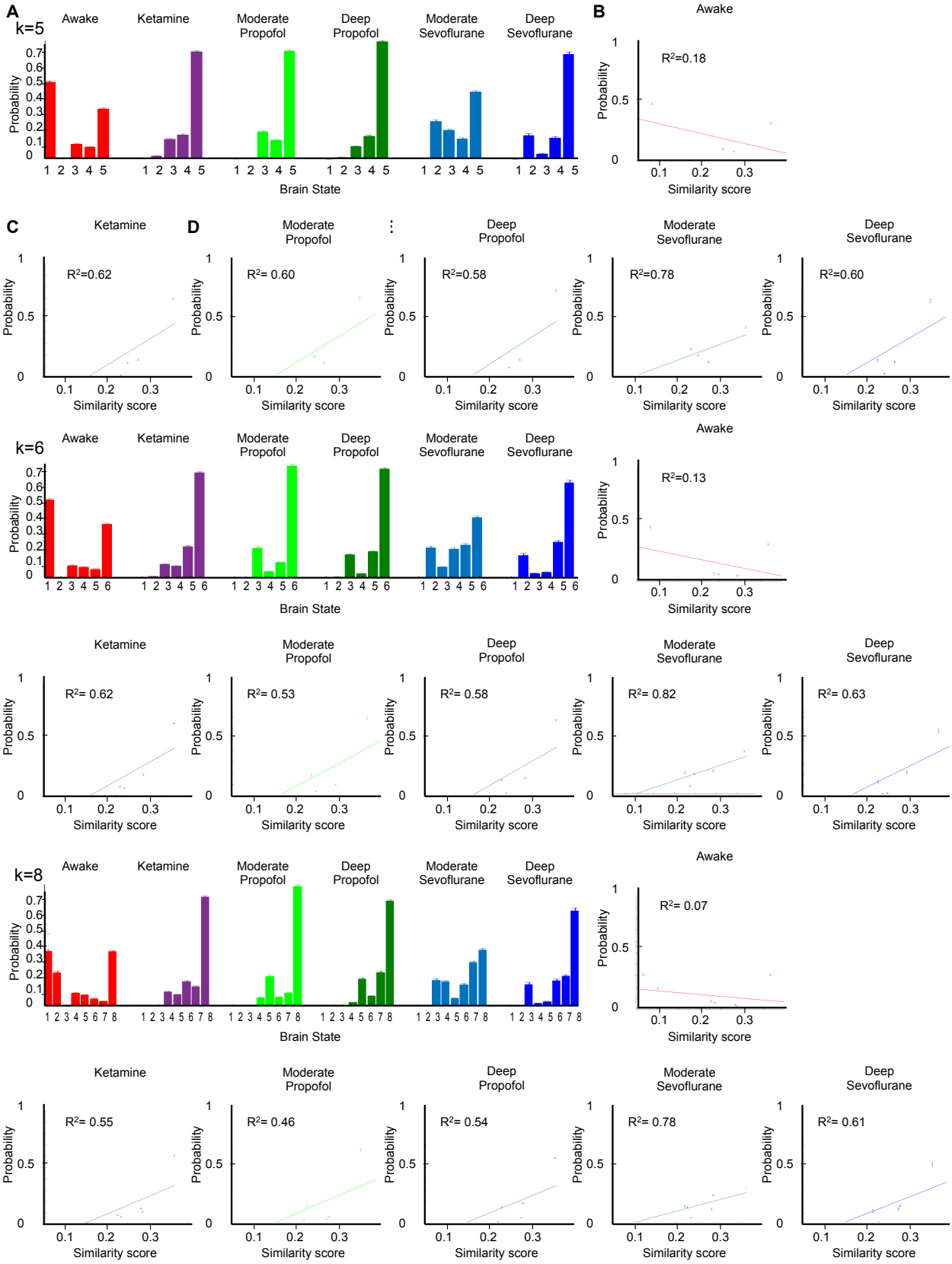
Supplementary Figure 9: Changes in dynamical correlations, Awake/Propofol

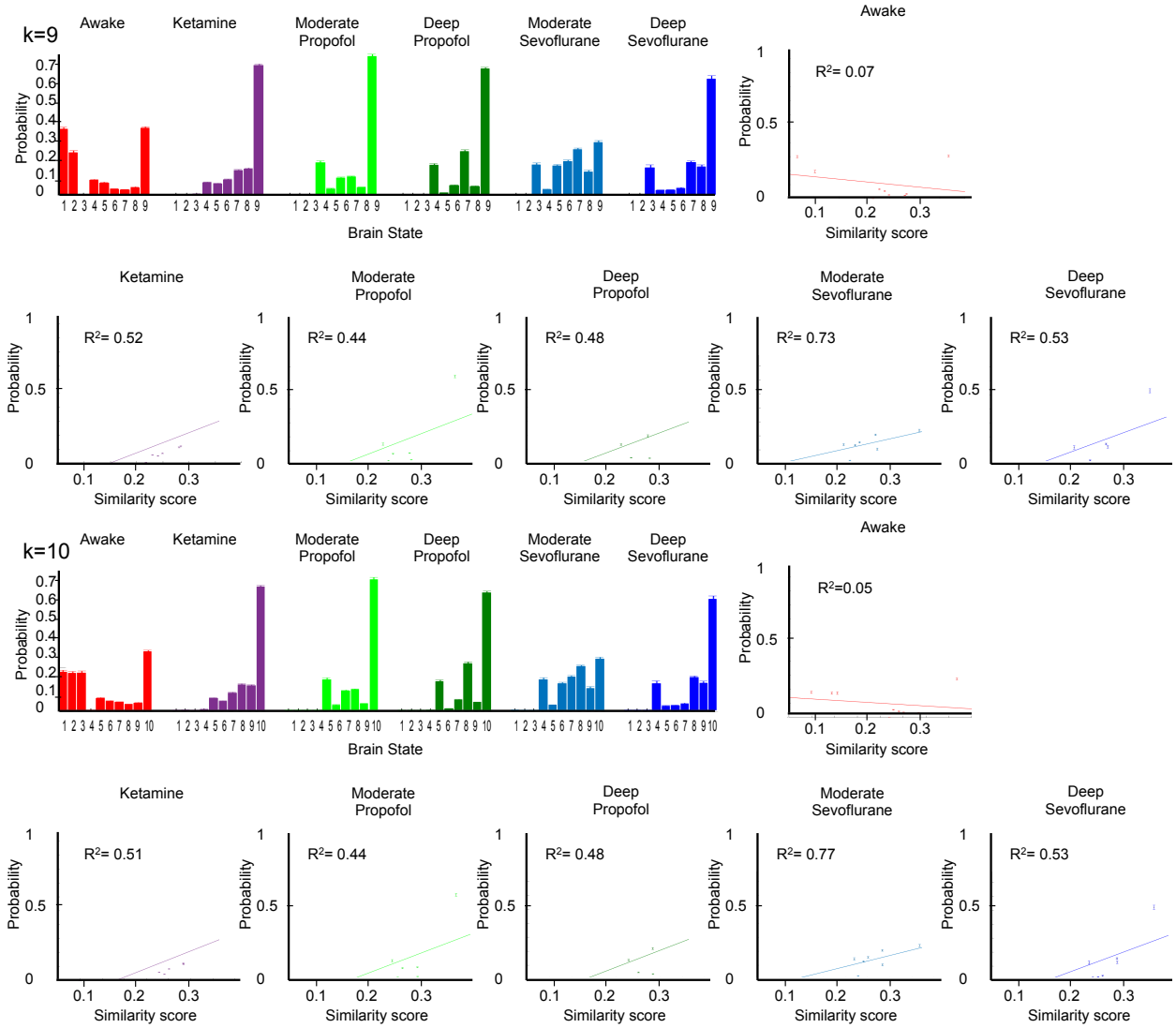


<u>Supplementary Figure 9:</u> Changes in dynamical correlations, Awake/Propofol

To explore the dependence of results on the parameter k (number of predefined brain states), a wide range of k values [5, 6, 7, 8, 9, 10] was explored for the awake state and propofol anesthesia. *(A)* Probability distributions of brain states for the awake state, moderate and deep propofol anesthesia. Each bar represents the within-condition probability of occurrence of a state. Error bars stand for SEM. *(B)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for the awake state. *(C)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for moderate propofol anesthesia. *(D)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for deep propofol anesthesia.

Supplementary Figure 10: Changes in dynamical correlations, Awake/All Anesthetics



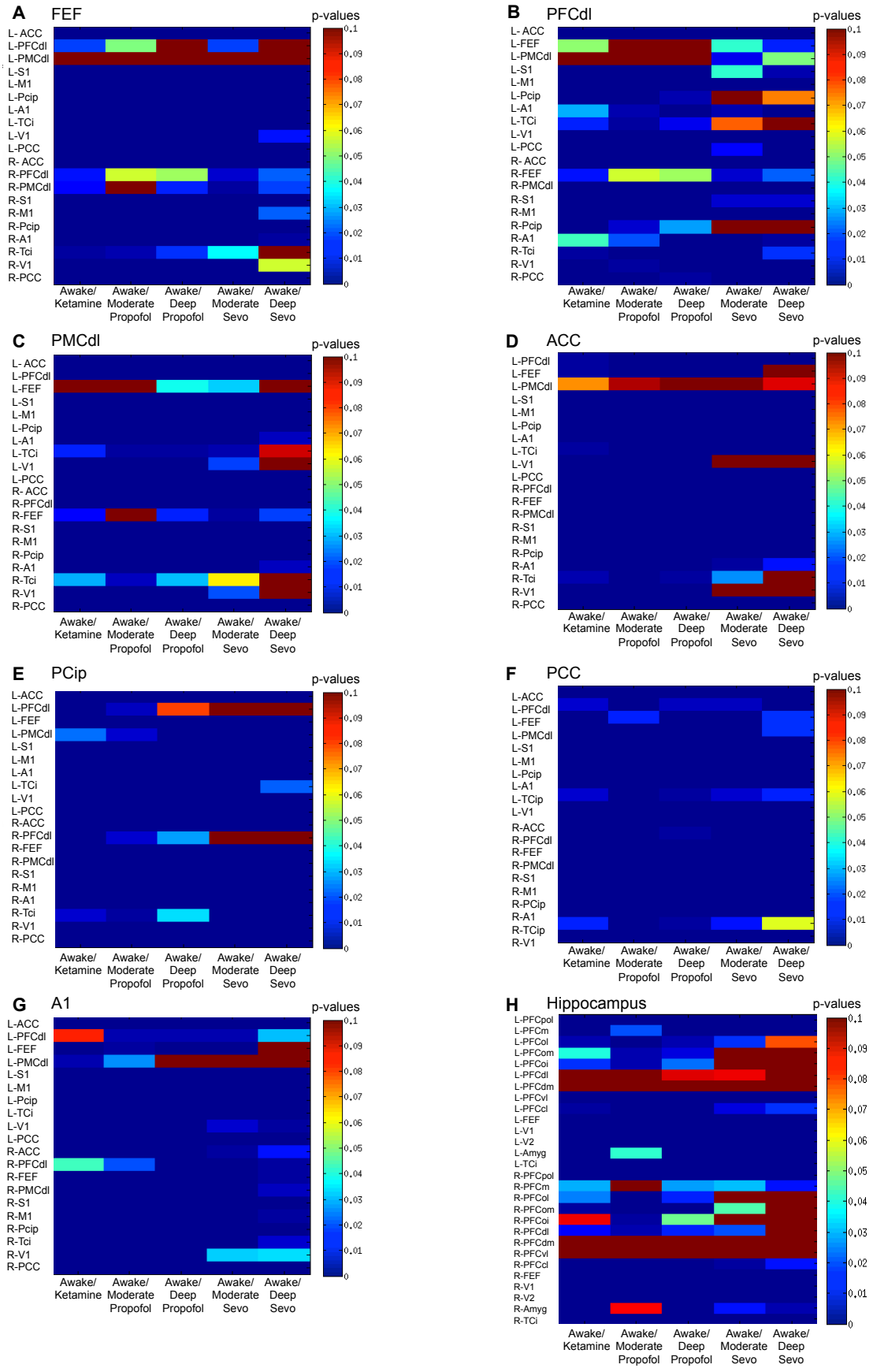


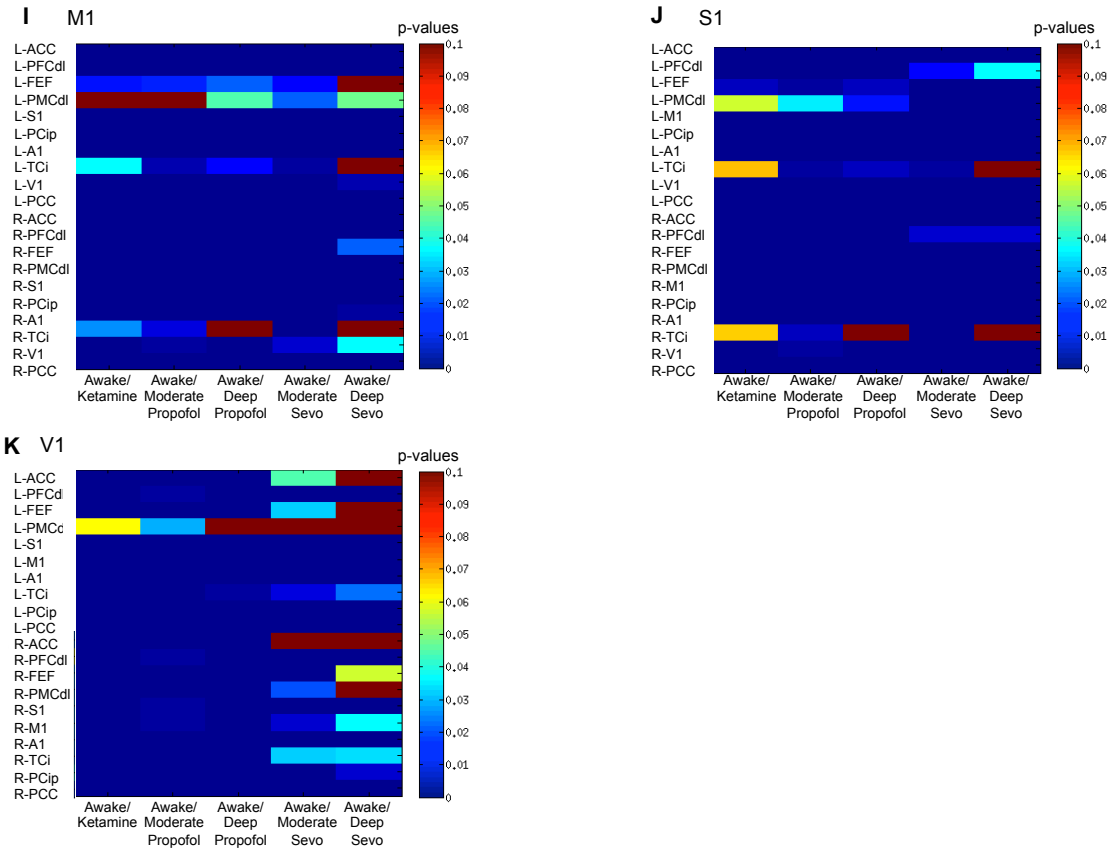
<u>Supplementary Figure 10:</u> Changes in dynamical correlations, Awake/All anesthetics

To explore the dependence of results on the parameter k (number of predefined brain states), a wide range of k values [5, 6, 7, 8, 9, 10] was explored for the awake state and all anesthetics (supplementary figure 6 shows results for k = 7) *(A)* Probability distributions of brain states for the awake state and all anesthetics. Each bar represents the within-condition probability of occurrence of a state. Error bars stand for SEM. *(B)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for the awake state. *(C)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for ketamine anesthesia. *(D)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for moderate propofol anesthesia. *(E)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for deep propofol anesthesia. *(F)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for moderate sevoflurane anesthesia (at least 60 min after the initial ketamine injection). *(G)* Probability of occurrence of each brain state as a function of the similarity between functional and structural connectivity for deep sevoflurane anesthesia (at least 60 min after the initial ketamine injection).

The relation between the probability distributions (column A) and the probability of occurrence of a brain state and the similarity to the structural connectivity (columns B-G) do not change with k for the awake state and for the different anesthetics.

Supplementary Figure 11 : p-values matrices for the Anova comparison of the awake state versus anesthesia in stationary functional correlations within the macaque Global Neuronal Workspace nodes and sensori-motor areas





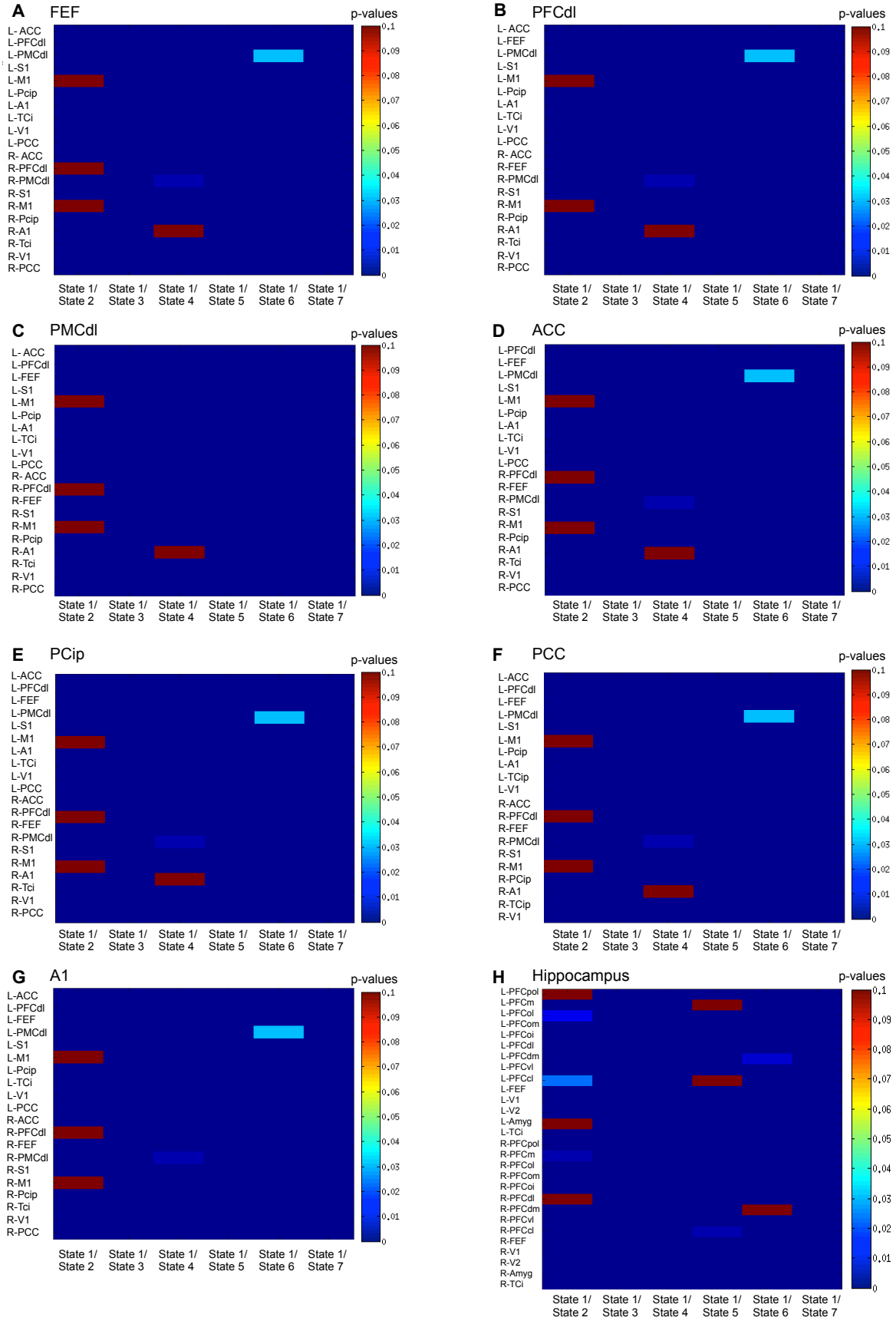
<u>Supplementary Figure 11:</u>

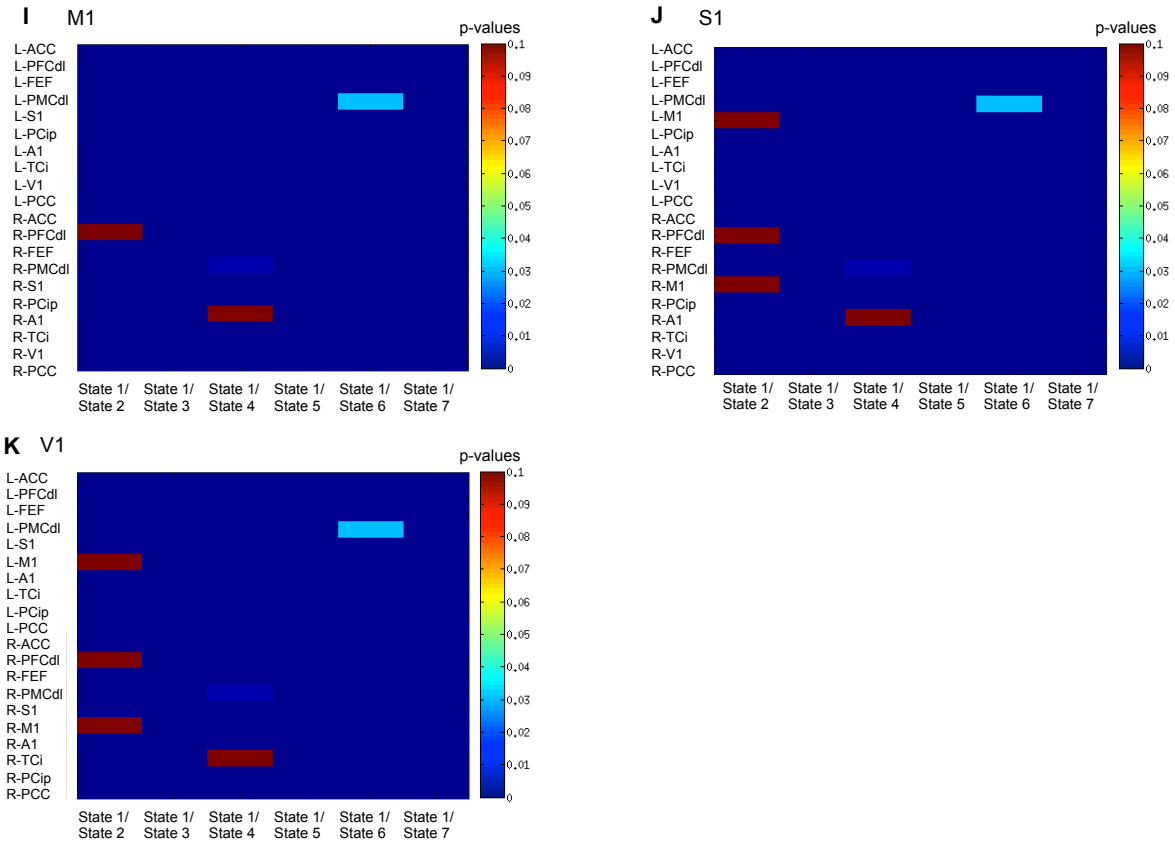
p-values matrices for the Anova comparison of the awake state versus anesthesia in stationary functional correlations within the macaque Global Neuronal Workspace nodes and sensori-motor areas

On the x-axis, arousal states (awake versus ketamine, awake versus moderate propofol sedation, awake versus deep propofol anesthesia, awake versus moderate sevoflurane anesthesia, awake versus deep sevoflurane anesthesia). On the y-axis, regions from the macaque Global Neuronal Workspace as defined in Uhrig et al., 2014 (Uhrig et al., 2014)(ACC, PFCpol, FEF, PMCdl, S1, M1, Pcip, A1, TCi, V1, PCC of the left (L) and right (R) hemisphere). For each region, the matrix represents the p-values for the comparison of the awake state versus one anesthesia condition between the defined region (seed) and the remaining Global Neuronal Workspace nodes.

Anterior cingulate cortex (ACC); Prefrontal polar cortex (PFCpol); Medial prefrontal cortex (PFCm) ; Prefrontal polar cortex (PFCol); Orbitomedial prefrontal cortex (PFCom); Orbitoinferior prefrontal cortex (PFCoi); Dorsolateral prefrontal cortex (PFCdl); Dorsomedial prefrontal cortex (PFCdm) ; Ventrolateral prefrontal cortex (PFCvl) ; Centrolateral prefrontal cortex (PFCcl), Frontal eye fields (FEF) ; Dorsolateral premotor cortex (PMCdl); Primary somatosensory cortex (S1); Primary motor cortex (M1) ; Intraparietal cortex (Pcip), Primary auditory cortex (A1); Amygdala (Amyg) , Inferior temporal (TCi), Visual area 1 (V1); Visual area 2 (V2); Posterior cingulate cortex (PCC).

Supplementary Figure 12 : p-values matrices for the Anova comparison in dynamical functional correlations (Brain state 1 versus brain state 2) within the macaque Global Neuronal Workspace nodes and sensori-motor areas





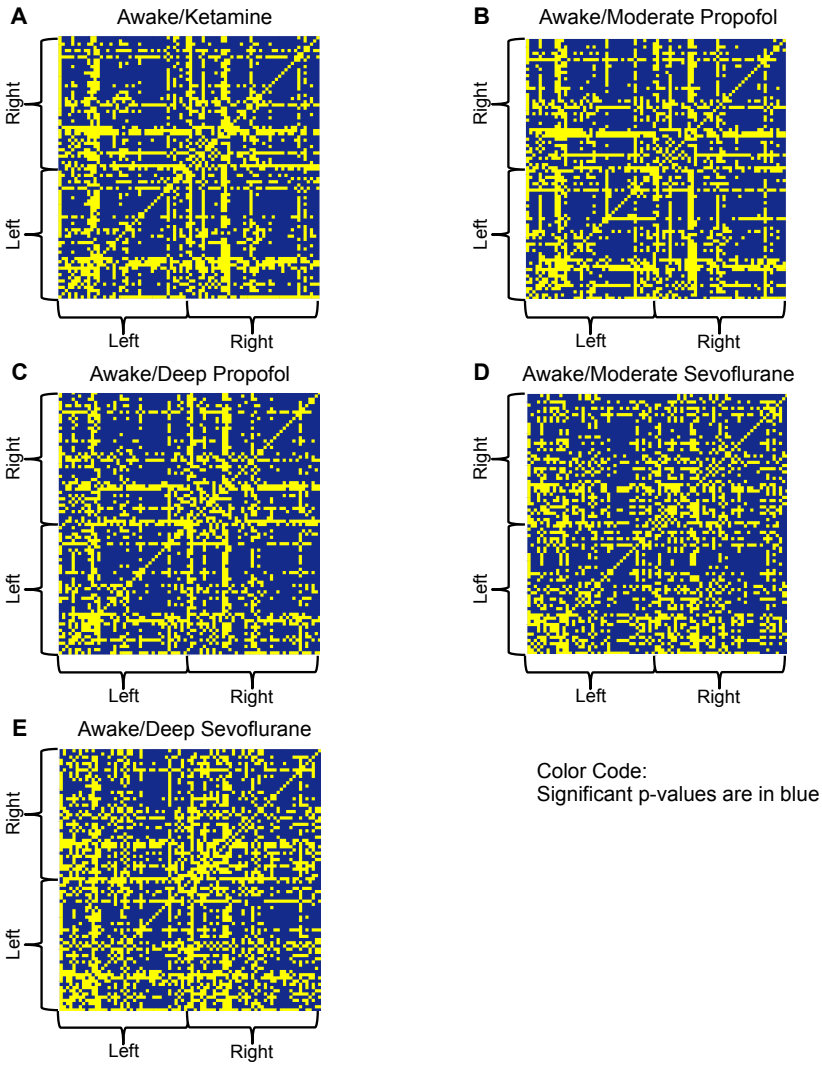
Supplementary Figure 12:

p-values matrices for the Anova comparison in dynamical functional correlations (Brain state 1 versus brain state 2) within the macaque Global Neuronal Workspace nodes and sensori-motor areas

On the x-axis, brain states. On the y-axis, regions from the macaque Global Neuronal Workspace as defined in Uhrig et al., 2014 (Uhrig et al., 2014)(ACC, PFCpol, FEF, PMCdl, S1, M1, Pcip, A1, TCi, V1, PCC of the left (L) and right (R) hemisphere). For each region, the matrix represents the p-values for the comparison of two brain states (state 1 versus state 2, state 1 versus state 3, state 1 versus state 4, state 1 versus state 5, state 1 versus state 6, state 1 versus state 7) between the defined region (seed) and the remaining Global Neuronal Workspace nodes.

Anterior cingulate cortex (ACC); Prefrontal polar cortex (PFCpol); Medial prefrontal cortex (PFCm) ; Prefrontal polar cortex (PFCol); Orbitomedial prefrontal cortex (PFCom); Orbitoinferior prefrontal cortex (PFCoi); Dorsolateral prefrontal cortex (PFCdl); Dorsomedial prefrontal cortex (PFCdm) ; Ventrolateral prefrontal cortex (PFCvl) ; Centrolateral prefrontal cortex (PFCcl), Frontal eye fields (FEF) ; Dorsolateral premotor cortex (PMCdl); Primary somatosensory cortex (S1); Primary motor cortex (M1) ; Intraparietal cortex (Pcip), Primary auditory cortex (A1); Amygdala (Amyg) , Inferior temporal (TCi), Visual area 1 (V1); Visual area 2 (V2); Posterior cingulate cortex (PCC).

Supplementary Figure 13: p-values matrices for the t-test comparison of the awake state versus anesthesia in stationary functional correlations



Supplementary Figure 13:
p-values matrices for the ANOVA comparison of the awake state versus anesthesia in stationary functional correlations
(A) p-values for the comparison of the awake state versus ketamine anesthesia.
(B) p-values for the comparison of the awake state versus moderate propofol sedation.
(C) p-values for the comparison of the awake state versus deep propofol anesthesia.
(D) p-values for the comparison of the awake state versus moderate sevoflurane anesthesia.
(E) p-values for the comparison of the awake state versus deep sevoflurane anesthesia.
Significant p-values are in blue.