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**Supplementary information**

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**Exercise plasma boosts memory and dampens brain inflammation via clusterin**

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# Exercise plasma boosts memory and dampens brain inflammation via clusterin

Zurine De Miguel<sup>1,2,8,11,#</sup>, Nathalie Khoury<sup>1,8,11†</sup>, Michael J. Betley<sup>1,3,†</sup>, Benoit Lehallier<sup>1,8,11,##</sup>, Drew Willoughby<sup>1,8,11</sup>, Niclas Olsson<sup>4,###</sup>, Andrew Yang<sup>1,8,11</sup>, Oliver Hahn<sup>1,8,11</sup>, Nannan Lu<sup>1,8,11</sup>, Ryan Vest<sup>1,8,11</sup>, Liana Bonanno<sup>1,8,11</sup>, Lakshmi Yerra<sup>6</sup>, Lichao Zhang<sup>9</sup>, Nay Lui Saw<sup>5</sup>, J. Kaci Fairchild<sup>6</sup>, Davis Lee<sup>1,8,11</sup>, Hui Zhang<sup>1,8,11</sup>, Patrick L. McAlpine<sup>10</sup>, Mehrdad Shamloo<sup>5</sup>, Joshua E. Elias<sup>4,9</sup>, Thomas A. Rando<sup>1,6,8</sup>, Tony Wyss-Coray<sup>1,6,8,11</sup>

1 Department of Neurology and Neurological Sciences, Stanford University School of Medicine, Stanford, CA 94305, USA.

2 Psychology Department, California State University, Monterey Bay, CA, USA.

3 Neurosciences Graduate Training Program, Stanford University School of Medicine, Stanford, CA 94305, USA.

4 Department of Chemical and Systems Biology, Stanford Medicine, Stanford, CA 94305, USA.

5 Behavioral and Functional Neuroscience Laboratory, Stanford Medicine, Stanford, CA 94305, USA.

6 The Veterans Affairs Palo Alto HealthCare System, Palo Alto, CA 94305, USA.

7 Glenn Center for the Biology of Aging and Department of Neurology and Neurological Sciences, Stanford University School of Medicine, Stanford, CA 94305, USA.

9 Chan Zuckerberg Biohub, Stanford, CA, USA

10 Otolaryngology Head and Neck Surgery Research Division, Stanford University, Stanford, CA 94305

11 Wu Tsai Neurosciences Institute, Stanford University, Stanford, CA, USA.

† These authors contributed equally to this work.

\*Correspondence to [twc@stanford.edu](mailto:twc@stanford.edu) (T.W.-C.)

# current address: California State University, Monterey Bay, CA, USA

## current address: Alkahest, Inc., San Carlos, CA, USA

### current address: Calico Life Sciences LLC, South San Francisco, CA, USA

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### **Supplementary Table 1**

Bulk RNA-sequencing hippocampal gene counts from mice injected with CP or RP.

### **Supplementary Table 2**

List of redundancy depleted Gene Ontology terms. *P*-value of the enriched GO terms was provided by the authors and calculated using the Fisher Exact test on DEGs comparing mice injected with CP or RP (Wald test,  $P < 0.05$ ). Semantic similarity measure was Resnik measurement (0.7 distance).

### **Supplementary Table 3**

Bulk RNA-sequencing hippocampal gene counts from male mice (3-4 months of age) injected with LPS were treated with saline, runner plasma or control plasma (SAL – LPS, LPS – CP or LPS - RP). An additional control group received saline for all injections (SAL – SAL) (n=7-8 per group).

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List of target and housekeeping genes in the Fluidigm 96.96 Dynamic Array IFC for Gene Expression chip.

### **Supplementary Table 6**

List of redundancy depleted Gene Ontology terms. *P*-value of the enriched GO terms was provided by the authors and calculated using the Fisher Exact *t*-test on DEGs comparing mice injected with LPS and treated with saline, runner plasma or control plasma (SAL – LPS, LPS – CP or LPS - RP) and mice that received saline for all injections (SAL – SAL) (Wald test,  $P < 0.05$ ). Semantic similarity measure was Resnik measurement (0.7 distance).

### **Supplementary Table 7**

Abundance of plasma proteins from 28-day-runner and control male mice detected via shotgun mass spectrometry proteomic unbiased approach.

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List of significantly changed proteins (Student's two-tailed *t* test,  $P < 0.05$ ) in plasma samples from 28-day-runner or control male.

### **Supplementary Table 9**

List of redundancy depleted Gene Ontology terms. *P*-value of the enriched GO terms was provided by the authors and calculated using the Fisher Exact test on significantly changed proteins (Student's two-tailed *t* test,  $P < 0.05$ ) between 28-day-runner and control mice. Semantic similarity measure was Resnik measurement (0.7 distance).

### **Supplementary Table 10**

List of genes and their corresponding FC and significance (MAST test, FDR < 0.05) when comparing gene expression in BECs of mice treated with Saline, LPS, and LPS+CLU.

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List of Gene Ontology terms (Benjamini-Hochberg test,  $P < 0.05$ ) of BECs genes that increase with LPS inoculation and decrease with CLU treatment

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List of Gene Ontology terms (Benjamini-Hochberg test,  $P < 0.05$ ) of BECs genes that decrease with LPS inoculation and increase with CLU treatment

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List of Gene Ontology terms (Benjamini-Hochberg test,  $P < 0.05$ ) of BECs genes that increase in APP mice and decrease with CLU treatment using a fold change of 1.1.

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List of Gene Ontology terms (Benjamini-Hochberg test,  $P < 0.05$ ) of BECs genes that decrease in APP mice and decrease with CLU treatment

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#### **Supplementary Table 18**

List of Gene Ontology terms (Fisher Exact  $t$ -test) of significantly changed human plasma proteins (paired Student's two-tailed  $t$ -test,  $P < 0.05$ ) in humans before and after 6 months of exercise intervention.

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Comparison of changes in complement and coagulation plasma proteins in humans before and after 6 months of exercise intervention (paired Student's two-tailed  $t$ -test,  $P < 0.05$ ) and 28-day runner mice and control (Student's two-tailed  $t$ -test,  $P < 0.05$ ).

#### **Supplementary Table 20**

Description of patient's demographic information