O2k brief Alzheimer's disease

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High-resolution respirometry: Alzheimer's disease

Hippocampal Growth Factor and Myokine Cathepsin B Expression following Aerobic and Resistance Training in 3xTg-AD Mice

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Unaffected mitochondrial respiration of the hippocampus in exercise-trained 3xTg-AD mice

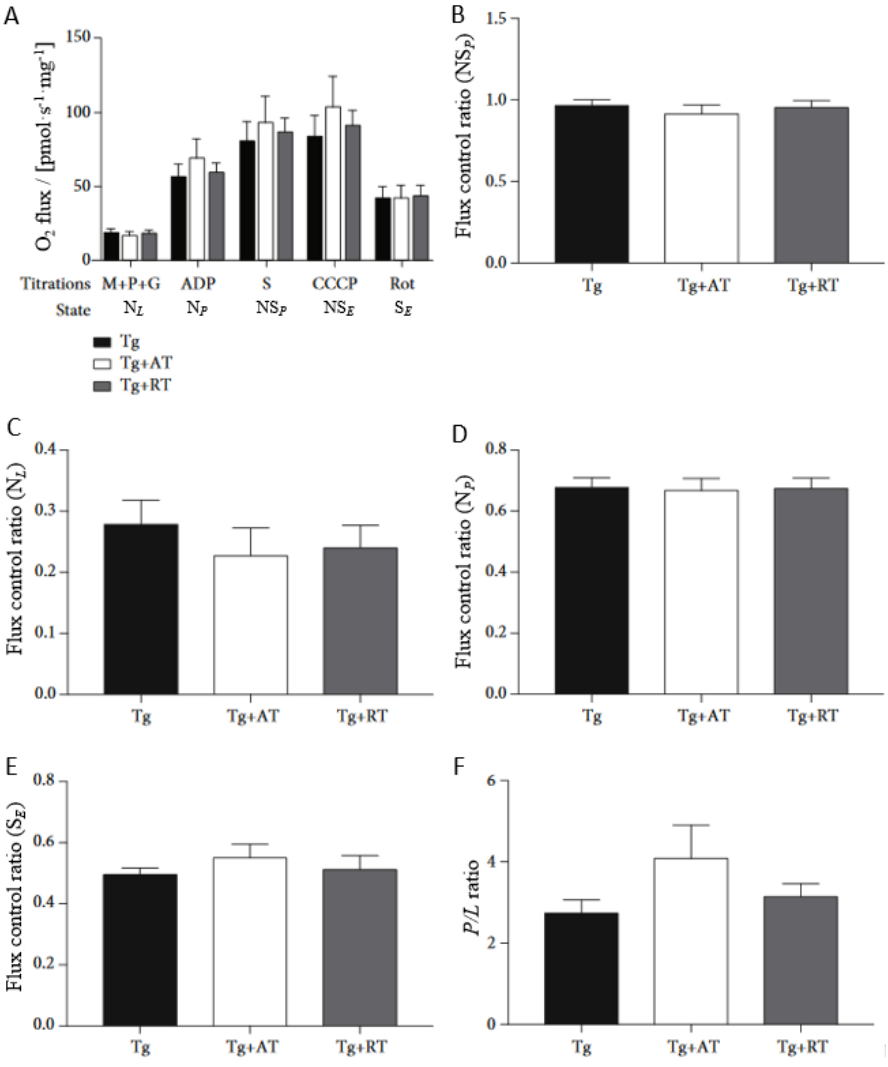

Figure 1. A: Mass-specific O_2 flux of permeabilized hippocampal tissues using a substrate-uncoupler-inhibitor titration protocol. N_L*:* NADH-linked LEAK respiration through addition of malate, pyruvate, and glutamate (M+P+G); N_P*:* NADH-linked oxidative phosphorylation (OXPHOS) after ADP addition; NS_P*:* NADH- and succinate-linked OXPHOS after succinate (S) addition; NS_E: NS-electron transfer (ET) capacity by stepwise titration of carbonyl cyanide m-chlorophenyl hydrazine (CCCP); S_E: ET-capacity after rotenone (Rot) addition. **B-E:** *Flux control ratios (FCRs)* are ratios of O_2 fluxes normalized for NS_E. *FCRs* shown for **(B)** NS_P, **(C)** N_L, **(D)** N_P, **(E)** S_E. **(F).** *P/L* ratio determined as N_P divided by N_L. Data presented as mean ± SE. Tg: nonexercised group ; Tg+AT: aerobic-trained group; Tg+RT: resistance-trained group; *N*=10/group.

O2k-brief communicated by C Cecatto and L Tindle-Solomon
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Reduced β-amyloid but unaltered brain-derived neurotrophic factor (BDNF) expression in resistance-trained 3xTg-AD mice

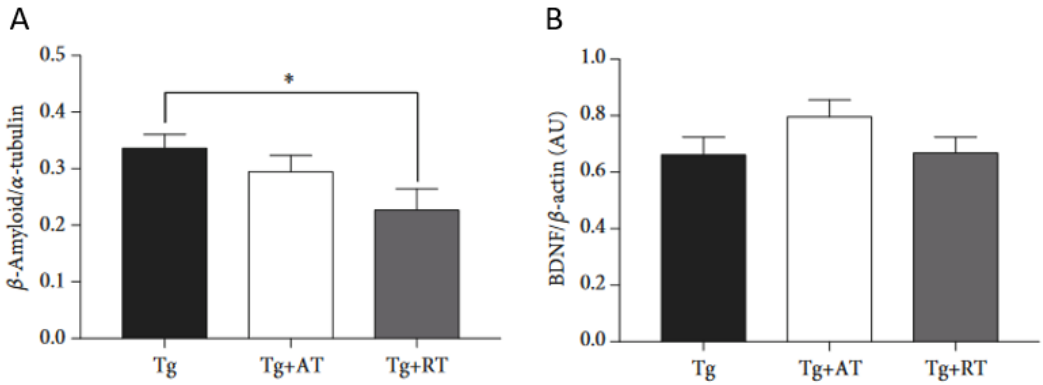

Figure 2. A: β-amyloid expression normalized to α-tubulin. **B:** BDNF normalized to β-actin. Data presented as mean ± SE. Tg: nonexercised group; Tg+AT: aerobic-trained group; Tg+RT: resistance-trained group; *N*=10/group.

Cathepsin B (CatB) and insulin-like growth factor 1 (IGF-1) expression in exercise-trained 3xTg-AD mice

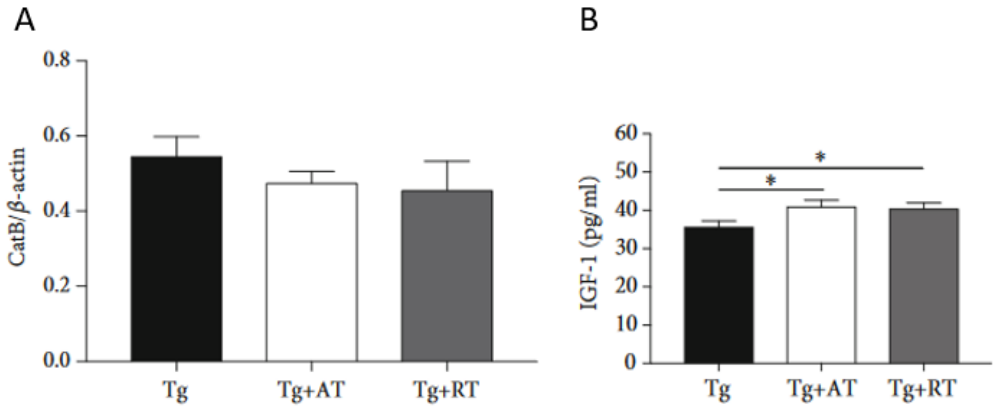

Figure 3. A: CatB expression in skeletal muscle normalized to β-actin. **B:** IGF-1 concentration in hippocampal homogenate measured by ELISA. Data presented as mean ± SE. Tg: nonexercised group; Tg+AT: aerobic-trained group; Tg+RT: resistance-trained group; *N*=10/group.

Resistance training in a mouse model of Alzheimer's disease (AD) did not improve mitochondrial respiration in hippocampal permeabilized tissue, but increased IGF-1 levels, decreased hippocampal β-amyloid load and improved peripheral comorbidities of AD, *e.g.* loss of strength.

Reference: Pena GS, Paez HG, Johnson TK, Halle JL, Carzoli JP, Visavadiya NP, Zourdos MC, Whitehurst MA, Khamoui AV (2020) Hippocampal growth factor and myokine cathepsin B expression following aerobic and resistance training in 3xTg-AD mice. Int J Chronic Dis 2020:Article ID 5919501.

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