Supporting Information

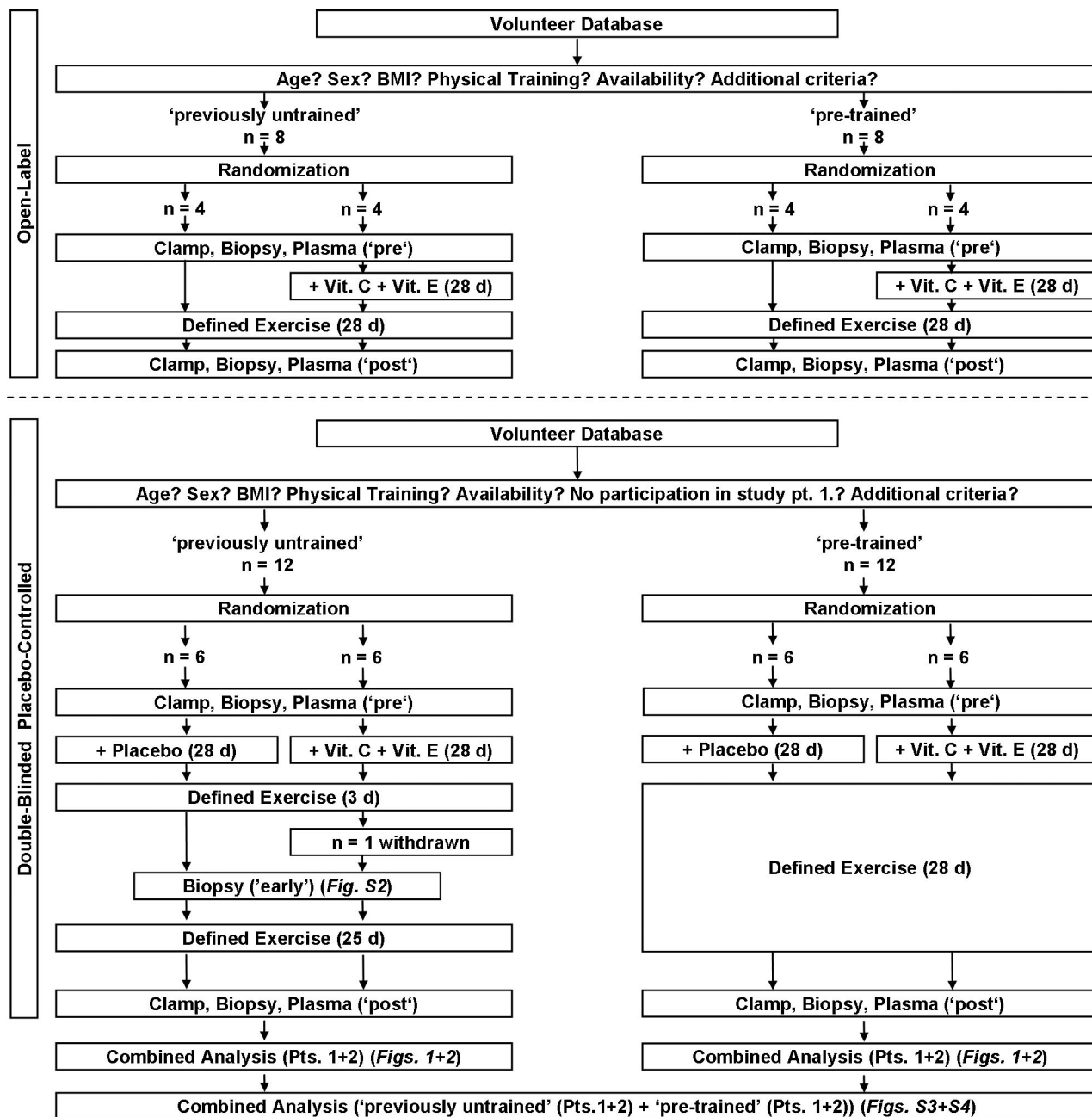## Ristow et al. 10.1073/pnas.0903485106

Fig. S1. Study design. The study consisted of 2 parts including an open-label first part (*Upper*), and double-blinded placebo-controlled second part (*Lower*), including previously untrained individuals (*Left*) and previously trained individuals (*Right*). Both groups were randomly split into antioxidant-treatment or no/placebo-treatment and analyzed after exercise intervention and collection of samples as described in *Methods* section.
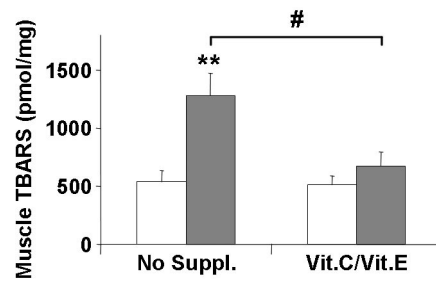
Fig. S2. Antioxidants prevent exercise-induced formation of oxidative stress in skeletal muscle. TBARS concentrations in skeletal muscle following a 3 day exercise intervention in the presence (*Left pair of bars*) and absence (*Right pair of bars*) of antioxidants before (white bars) and after (shaded bars) physical exercise. Bars depict means, error bars show standard error means. # indicates $0.01 < P < 0.05$ comparing ''no suppl.'' with ''Vit.C/Vit.E'' groups, ** indicates $0.001 \leq P \leq 0.01$ comparing data before and after 3 days of exercise.
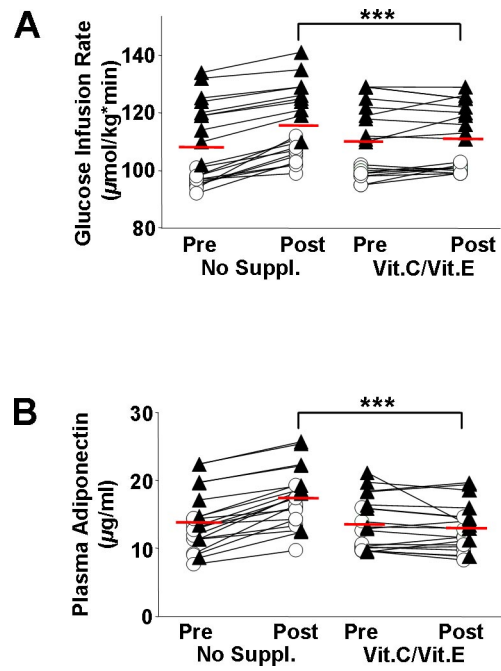
Fig. S3. Antioxidants prevent exercise-induced induction of insulin sensitivity (combined analysis). (*A*) depicts glucose infusion rates (GIR) during euglycemic hyperinsulinemic clamps in previously untrained individuals (open circles) and pretrained individuals (black triangles) before (pre, *Left*) and after (post, *Right*) physical exercise over 4 weeks. (*Left*) Individuals not taking any medication or placebo; (*Right*) individuals taking both vitamin C (1000 mg/day) and vitamin E (400 IU/day). Horizontal red lines depict means for untrained and trained individuals together (*n* = 19 and *n* = 20, respectively). Significances: *** indicates $P < 0.001$ comparing delta values before and after 4 weeks of exercise (ANOVA). *B* depicts plasma adiponectin levels in a similar manner as *A*.
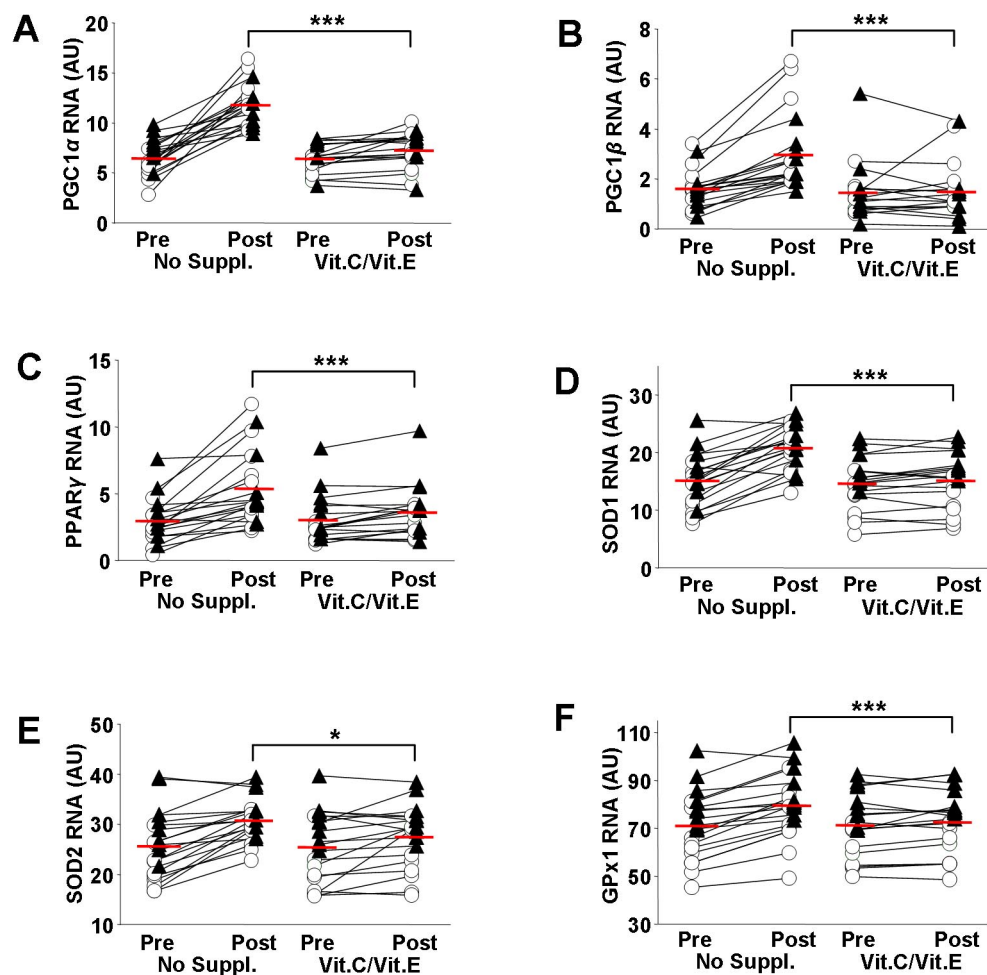
Fig. S4. Antioxidants prevent induction of molecular mediators of insulin sensitivity and antioxidant defense in exercised skeletal muscle (combined analysis). (*A*) Expression levels of *PGC1α* RNA transcripts in skeletal muscle biopsies derived from previously untrained (white circles) and pretrained (black triangles) individuals before (pre, *Left*) and after (post, *Right*) physical exercise over 4 weeks as described in the *Methods* section. (*Left*) Individuals not taking any medication or placebo; (*Right*) individuals taking both vitamin C (1000 mg/day) and vitamin E (400 IU/day). Horizontal red lines depict means for untrained and trained individuals together (*n* = 19 and *n* = 20, respectively). (*B*) expression levels of *PGC1β* RNA transcripts; (*C*) expression levels of *PPARγ* RNA; (*D*) levels of superoxide dismutase 1 (*SOD1*) transcripts; (*E*) RNA levels of superoxide dismutase 2 (*SOD2*); (*F*) glutathione peroxidase 1 (*GPx1*) RNA expression levels, all in a similar fashion as in (*A*). Significances: * indicates $0.01 < P < 0.05$ comparing delta values before and after 4 weeks of exercise (ANOVA), *** indicates $P < 0.001$ (ANOVA).

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