

**Supplementary Table S1.** Keywords used in database search strategy

| Concept 1: Inflammation | Concept 2: Exercise | Concept 3: Obesity |
|-------------------------|---------------------|--------------------|
| CRP                     | Aerobic exercise    | Fat accumulation   |
| IL-6                    | Aerobic training    | Obesity            |
| IL-10                   | Endurance exercise  | Overweight         |
| Inflammation            | Endurance training  |                    |
| TNF- $\alpha$           | Exercise            |                    |
| IL-1ra                  | Resistance exercise |                    |
| IL-1 $\beta$            | Resistance training |                    |
| IL-8                    | Training            |                    |
| MCP-1                   |                     |                    |

IL-1 $\beta$ , interleukin-1; IL-6, interleukin-6; IL-8, interleukin-8; IL-10, interleukin-10; MCP-1, monocyte chemoattractant protein 1; PCR, protein C-reactive; TNF- $\alpha$ , tumor necrosis factor alpha.

Example of a search strategy for protein C-reactive (CRP):

((("CRP"[Mesh] OR "CRP"[Title/Abstract]) OR ("protein C-reactive"[Mesh]) OR "protein C-reactive"[Title/Abstract]) OR ("inflammation"[Mesh] OR "inflammation"[Title/Abstract])) AND ((("exercise"(Mesh] OR "exercise"[Title/Abstract]) OR ("training"(Mesh] OR "training"[Title/Abstract]) OR ("aerobic exercise"[Mesh] OR "aerobic exercise"[Title/Abstract]) OR ("aerobic training"[Mesh] OR "aerobic training"[Title/Abstract]) OR ("endurance exercise"[Mesh] OR "endurance exercise"[Title/Abstract]) OR ("endurance training"[Mesh] OR "endurance training"[Title/Abstract]) OR ("resistance exercise"[Mesh] OR "resistance exercise"[Title/Abstract]) OR ("resistance training"[Mesh] OR "resistance training"[Title/Abstract])) AND ((("Fat accumulation"(Mesh] OR "fat accumulation"[Title/Abstract]) OR ("Obesity"(Mesh] OR "obesity"[Title/Abstract]) OR ("Overweight"(Mesh] OR "overweight"[Title/Abstract]))))

**Supplementary Table S2.** PEDro Scale for quality assessment of the studies included in the systematic review.

| Study                             | 1   | 2  | 3  | 4  | 5 | 6 | 7 | 8 | 9  | 10 | 11 | Score |
|-----------------------------------|-----|----|----|----|---|---|---|---|----|----|----|-------|
| Ahmadizad et al. (2015)           | Yes | 0  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 5     |
| Arikawa et al. (2010)             | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 5     |
| Auerbach et al. (2013)            | Yes | 1  | NA | 1  | 0 | 0 | 1 | 0 | 1  | 1  | 1  | 6     |
| Besse-Patin et al. (2013)         | Yes | NA | NA | NA | 0 | 0 | 0 | 1 | 1  | NA | 1  | 3     |
| Brunelli et al. (2015)            | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 4     |
| Bruun et al. (2005)               | Yes | NA | NA | NA | 0 | 0 | 0 | 1 | 1  | NA | 1  | 3     |
| Christiansen et al. (2010)        | Yes | 1  | 0  | 0  | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 4     |
| Duzova et al. (2018)              | Yes | 0  | 0  | 0  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 4     |
| Dvorakova-Lorenzova et al. (2005) | Yes | NA | NA | NA | 0 | 0 | 0 | 1 | 1  | NA | 1  | 3     |
| Esposito et al. (2003)            | Yes | 1  | 1  | 1  | 0 | 0 | 1 | 1 | 1  | 1  | 1  | 8     |
| Gram et al. (2017)                | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 4     |
| Ho et al. (2013)                  | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 5     |
| Jae et al. (2006)                 | Yes | 0  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 5     |
| Khoo et al. (2015)                | Yes | 1  | 1  | 1  | 0 | 0 | 1 | 1 | 1  | 1  | 1  | 8     |
| Klimcakova et al (2006)           | Yes | NA | NA | NA | 0 | 0 | 0 | 1 | NA | NA | 1  | 2     |
| Kolahdouzi (2019)                 | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 6     |
| Kondo et al. (2006)               | Yes | 0  | 0  | NA | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 4     |
| Lakhdar et al. (2013)             | Yes | 1  | 0  | 0  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 5     |
| Leggate et al. (2012)             | Yes | NA | NA | NA | 0 | 0 | 0 | 1 | 1  | NA | 1  | 3     |
| Loria-Kohen et al. (2013)         | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 5     |
| Marcell et al. (2005)             | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 6     |
| Moghadasi et al. (2012)           | Yes | 1  | 0  | 0  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 5     |
| Nikseresht et al. (2014)          | Yes | 1  | 0  | 0  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 5     |
| Nikseresht et al. (2018)          | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 6     |
| Olson et al. (2007)               | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 6     |
| Polak et al. (2006)               | Yes | NA | NA | NA | 0 | 0 | 0 | 1 | 1  | NA | 1  | 3     |
| Vella et al. (2017)               | Yes | 1  | 0  | 1  | 0 | 0 | 0 | 1 | 1  | 1  | 1  | 6     |

NA, not applicable.

**Supplementary Table S3.** Effects of training on the circulating concentrations of IL-1 $\beta$  in sedentary adults with overweight and obesity.

| Study                  | Subjects   | Experimental conditions                                      | Training protocol  | Pre- vs Post-training differences         |  |
|------------------------|--|--|--|---|--|
|                        |  |  |  | Fat Mass (%)                              | IL-1 $\beta$ (pg/ml)                     |
| Klimcakova et al. 2006 | Men<br>(50.4 $\pm$ 2.3 yr)<br>(N=12)               | EC1: RT<br>(33.6 $\pm$ 1.2 kg/m <sup>2</sup> ;<br>N=12)      | 12 weeks<br>3 days/week<br>60 min/session<br>17 exercises, 1x12-15<br>at 60-70% RM | EC1: 31.6 $\pm$ 4.9 vs<br>30.1 $\pm$ 4.2  | EC1: 1.6 $\pm$ 1.2 vs<br>1.0 $\pm$ 0.5   |
| Auerbach et al. 2013   | Men<br>(20 to 40 yr)<br>(N=48)                     | EC1: ET<br>(28.1 $\pm$ 1.3 kg/m <sup>2</sup> ;<br>N=12)      | 12 weeks<br>7 days/week  | EC1: 31.3 $\pm$ 4.1 vs<br>29.4 $\pm$ 3.8* | EC1: 0.9 $\pm$ 1.0 vs<br>0.7 $\pm$ 0.2   |
|                        |  | EC2: Control<br>(28.1 $\pm$ 1.3 kg/m <sup>2</sup> ;<br>N=12) | 65-85% HRR (600<br>kcal)   | EC2: 31.3 $\pm$ 4.1 vs<br>31.1 $\pm$ 3.5  | EC2: 0.9 $\pm$ 1.0 vs<br>0.8 $\pm$ 0.9   |
| Tartibian et al. 2015  | Postmenopausal<br>women<br>(50 to 65 yr)<br>(N=28) | EC1: ET<br>(25.5 $\pm$ 3.9 kg/m <sup>2</sup> ;<br>N=14)      | 16 weeks<br>3-4 days/week  | EC1: 27.4 $\pm$ 4.7 vs NR                 | EC1: 3.6 $\pm$ 0.7 vs<br>2.1 $\pm$ 0.9*# |
|                        |  | EC2: Control<br>(25.0 $\pm$ 3.1 kg/m <sup>2</sup> ;<br>N=14) | 25-30 min/session<br>Treadmill 55% HR <sub>max</sub>                               | EC2: 26.4 $\pm$ 5.4 vs NR                 | EC2: 3.5 $\pm$ 0.6 vs<br>3.7 $\pm$ 0.5   |

EC=experimental condition; ET=endurance training; HR<sub>max</sub>= maximal heart rate; HRR=heart rate reserve; NR= non-reported; RM=maximal repetition; RT, resistance training; \* P<0.05 within group comparison. # P<0.05 between groups comparison (vs control). Data are shown as mean  $\pm$  SD.

**Supplementary Table S4.** Effects of training on the circulating concentrations of IL-1ra in sedentary adults with overweight and obesity.

| Study                | Subjects                       | Experimental conditions                                | Training protocol        | Pre- vs Post-training differences |                            |
|----------------------|--------------------------------|--|--------------------------|-----------------------------------|----------------------------|
|                      |                                |  |                          | Fat Mass (%)                      | IL-1ra (pg/ml)             |
| Auerbach et al. 2013 | Men<br>(20 to 40 yr)<br>(N=48) | EC1: ET<br>(28.1±1.3 kg/m <sup>2</sup> ;<br>N=12)      | 12 weeks<br>7 days/week  | EC1: 31.3±4.1 vs<br>29.4±3.8*     | EC1: 251±120 vs<br>227±109 |
|                      |                                | EC2: Control<br>(28.1±1.3 kg/m <sup>2</sup> ;<br>N=12) | 65-85% HRR (600<br>kcal) | EC2: 31.3±4.1 vs<br>31.1±3.5      | EC2: 251±120 vs<br>239±94  |
|                      |                                |  |                          |                                   |                            |
|                      |                                |  |                          |                                   |                            |

EC=experimental condition; ET=endurance training; HRR=heart rate reserve; NR= non-reported; \* P<0.05 within group comparison. Data are shown as mean ± SD.

**Supplementary Table S5.** Effects of training on the circulating concentrations of IL-8 in sedentary adults with overweight and obesity.

| Reference         | Participants                             | Experimental conditions                         | Training protocol                                       | Pre- vs Post-training differences          |                          |
|-------------------|--|---|---|--|--------------------------|
|                   |  |   |   | Fat Mass (%)                               | IL-8 (pg/ml)             |
| Bruun et al. 2005 | Men (N=11) & Women (N=12) (NR yr)        | EC1: ET<br>(45.8±1.9 kg/m <sup>2</sup> ; N=23)  | 15 weeks  | EC1: 46.0±2.5 vs 41.1±2.3*                 | EC1: 5.6±0.6 vs 4.8±0.4* |
|                   |  |   | 5 days/week<br>2-3 h/session<br>Moderate intensity (NR) |  |                          |
| Vella et al. 2017 | Men (N=7) and Women (N=10) (18 to 44 yr) | EC1: HIIT<br>(29.9±3.3 kg/m <sup>2</sup> ; N=8) | 8 weeks   | EC1: 35.2±6.8 vs NR<br>EC2: 35.3±7.2 vs NR | EC1: 10.7±1.0 vs 8.6±1.0 |
|                   |  |   | 4 days/week<br>30 min/session                           |  |                          |
|                   |  | EC2: ET<br>(33.1±6.0 kg/m <sup>2</sup> ; N=9)   | EC1: 10 x (60s at 75-80% HRR + 60s at 35-40% HRR)       |  | EC2: 8.2±1.0 vs 11.7±0.9 |
|                   |  |   | EC2: 55-59% HRR   |  |                          |

EC=experimental condition; ET=Endurance training; HIIT=high-intensity interval training; HRR=heart rate reserve; NR=not reported; \* P<0.05 within group comparison. Data are shown as mean ± SD.

**Supplementary Table S6.** Effects of training on the circulating concentrations of MCP-1 in sedentary adults with overweight and obesity.

| Study                    | Subjects                                  | Experimental conditions                          | Training protocol  | Pre- vs Post-training differences |                           |
|--------------------------|---|--|--|-----------------------------------|---------------------------|
|                          |   |  |  | Fat Mass (%)                      | MCP-1 (pg/ml)             |
| Bruun et al. 2005        | Men (N=11) & Women (N=12) (NR yr)         | EC1: ET (45.8±1.9 kg/m <sup>2</sup> ; N=23)      | 15 weeks<br>5 days/week<br>2-3 h/session<br>Moderate intensity (NR)        | EC1: 46.0±2.5 vs 41.1±2.3*        | EC1: 141±8.3 vs 122±6.3*  |
| Christiansen et al. 2010 | Men (N=40) and Women (N=34) (18 to 45 yr) | EC1: ET (33.3±4.0 kg/m <sup>2</sup> ; N=25)      | 12 weeks<br>3 days/week<br>60-75 min/session (500-600 kcal)                | NR                                | EC1: 244±86 vs 218±89*    |
| Leggate et al. 2012      | Men (23.7±5.2 yr) (N=12)                  | EC1: HIIT (29.1±3.1 kg/m <sup>2</sup> ; N=12)    | 2 weeks<br>3 days/week<br>HIIT 10 x (4 min 85% VO <sub>2peak</sub> + NR R) | NR                                | EC1: 145±50 vs 128±38*    |
| Auerbach et al. 2013     | Men (20 to 40 yr) (N=48)                  | EC1: ET (28.1±1.3 kg/m <sup>2</sup> ; N=12)      | 12 weeks<br>7 days/week  | EC1: 31.3±4.1 vs 29.4±3.8*        | EC1: 102±36 vs 101.3±42.3 |
|                          |   | EC2: Control (28.1±1.3 kg/m <sup>2</sup> ; N=12) | 65-85% HRR (600 kcal)  | EC2: 31.3±4.1 vs 31.1±3.5         | EC2: 102±36 vs 108.4±41.5 |

EC=experimental condition; ET=Endurance training; HIIT=high intensity interval training; R=rest between series; HRR=heart rate reserve; HR<sub>max</sub>=maximal heart rate; VO<sub>2peak</sub>=peak oxygen uptake; NR=non-reported; ~=estimated data; \* P<0.05 within group comparison. Data are shown as mean ± SD.