CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Outrunning a bad diet: Interactions between exercise and a Western-style diet for adolescent mental health, metabolism and microbes
Authors	Nota, Minke H. C.;Nicolas, Sarah;O'Leary, Olivia F.;Nolan, Yvonne M.
Publication date	2023-04-06
Original Citation	Nota, M. H., Nicolas, S., O'Leary, O. F. and Nolan, Y. M. (2023) 'Outrunning a bad diet: interactions between exercise and a Western-style diet for adolescent mental health, metabolism and microbes', Neuroscience and Biobehavioral Reviews, 149, 105147 (14pp). doi: 10.1016/j.neubiorev.2023.105147
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1016/j.neubiorev.2023.105147
Rights	© 2023, Elsevier Ltd. All rights reserved. This manuscript version is made available under the CC BY-NC-ND 4.0 license. - https://creativecommons.org/licenses/by-nc-nd/4.0/
Download date	2026-11-06 23:37:46
Item downloaded from	https://hdl.handle.net/10468/14460

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Reference	Species, age, sex	Type & length of intervention	Peripheral alterations	Behavioural effects	Brain effects
Cadney et al., 2021	Mouse, adolescent, male	Control or high-runner line; SC or western diet; Sedentary or voluntary exercise; Interventions for 3wk from PND21, then 8wk washout until adult testing	Exercise vs. sedentary: ↓ corticosterone in SC-fed but not WD-fed (control-line) ↑ corticosterone in SD-fed HR animals ↑ serum leptin	Exercise vs. sedentary: ↓ anxiety-like behaviour	N/A
Maniam et al., 2010	Rat, juvenile, male	15 or 180 minute maternal separation; SC or CAF; Sedentary or voluntary exercise; 13 day maternal separation, then 6wk diet and exercise intervention	HFD and exercise reversed prolonged maternal separation-induced increase in plasma corticosterone	HFD and exercise reversed prolonged maternal separation-induced decreases in antidepressant-like and anxiety-like behaviours	HFD and exercise reversed prolonged maternal separation-induced increase in hippocampal GR, 5HT1A and BDNF expression
Cigarroa et al., 2016	Rat, adolescent, female	SC or CAF diet; Sedentary, control, low intensity treadmill or high intensity treadmill exercise; 8wk intervention	CAF vs. SC: ↑ plasma glucose, insulin, leptin & insulin resistance	CAF vs. SC: ↓ stress coping (partially reversed by exercise) high-intensity exercise ↓ anxiety-like behaviour in CAF-fed animals	N/A
Yang et al., 2020	Rat, young adult, male & female	HFD-fed; Sedentary or voluntary running exercise; 6wk intervention	Exercise vs. sedentary: ↓ fasting insulin in males ↑ insulin tolerance (stronger effect in males than females)	Exercise vs. sedentary: ↑ learning behaviour	N/A
Klein et al., 2016	Mouse, adolescent, female	SC or HFD; Sedentary or voluntary exercise; 12wk intervention	N/A	HFD vs. SC: ↓ reversal learning performance (prevented by exercise)	Exercise vs. sedentary: ↑ survival of hippocampal proliferating cells & newborn neurons
Liu et al., 2014	Mouse, adolescent, male	SC or HFD; Vehicle or CORT treatment; 8wk intervention, then all HFD-fed + CORT groups: vehicle, AICAR (AMPK activator) or exercise intervention (4wk)	HFD vs. SC: ↑ plasma corticosterone, glucose, leptin & insulin (exercise effects not tested) Exercise vs. sedentary: ↓ insulin resistance	Exercise vs. sedentary: ↓ anxiety-like behaviour ↑ antidepressant-like behaviour	N/A

Woo et al., 2013	Rat, adolescent, male	SC or HFD (13wk), then HFD group split into: SC or HFD; Sedentary or treadmill exercise; 8wk intervention	N/A	HFD vs. SC: ↓ spatial learning performance (reversed by exercise)	hippocampus HFD vs. SC: ↓ NGF (reversed by diet-switch) ↓ BDNF, p-p38MAPK, TrkA/B, MAPK1, CREB & Synapsin1 (reversed by exercise and/or diet-switch) ↓ p38MAPK (reversed by exercise + diet-switch)