

Microbial Metabolites and Neuroactive Compounds Dysbiosis induced by NCSs may have functional consequences for host physiology through an altered microbial ecosystem. Since *B. fragilis* has been identified as a GABA-producing bacterium [46,47], its proliferation under NCSs exposure may help explain the observed increases in appetite, body weight, and altered glucose metabolism. Specifically, NCS-induced changes have been associated with (1) a reduction in the production of SCFAs such as butyrate and propionate [38]; (2) increased intestinal permeability, potentially due to loss of mucin-degrading and tight-junction-stabilizing microbial species [13,39,40]; (3) elevated circulating endotoxin. Int. Mechanistically, GM-derived GABA is hypothesized to inhibit satiety hormone secretion, which, through the vagus nerve, disinhibits orexigenic hypothalamic neuropeptide Y (NPY) and the Agouti-related protein (AgRP) neurons (NPY/AgRP), thereby enhancing appetite [44]. Similarly, germ-free mice colonized with microbiota from saccharin-exposed donors exhibited a marked increase in *B. fragilis*, mirroring the donor profile [13]. J. Mol. Sci.