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(54) Title: IMMUNOLOGICAL EFFECTS OF METABOLITES

(57) Abstract: The present disclosure provides compositions and methods of using one or more of the metabolites spermidine, palmitoylethanolamide (PEA), oleoylethanolamide (OEA), and 1-methylnicotinamide (1-MNA) to induce an anti-inflammatory, anti-oxidant, and/or immuno-modulatory effect in a subject. The compositions and methods described herein can enhance biochemical functionalities relevant to overall health and disease progression, promote longevity and healthspan, and/or delay or inhibit the cellular aging process in the subject.



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