

Tissue homogenate preparation: Tissue samples weighing 300 mg were ground using a 60 Hz grinder at 4 °C for 1 min in a mixture of 4 mL/g of CH₃OH and 2 mL/g of ultrapure water. The resulting homogenate was then subjected to vortexing for 1 min after adding 4 mL/g of CHCl₃ and 4 mL/g of ultrapure water. The mixture was allowed to settle on ice for 15 mins and subsequently centrifuged at 10,000 rpm for 10 mins at 4 °C. The supernatant was carefully transferred to a new 5 mL Eppendorf (EP) tube and treated with running nitrogen to remove the methanol. The resulting liquid was freeze-dried at –80°C until further analysis. The freeze-dried powder was dissolved in 550 µL of PBS/D₂O buffer (pH 7.4, 150 mM), which contained 0.05% TMSP-2,2,3,3-D₄ (D, 98%) SODIUM-3-TRIMETHYLSILYLPROPIONATE (TSP, Cambridge Isotope Laboratories (CIL), Inc. #DLM-48, CAS #24493-21-8)). After thorough mixing, the solution was centrifuged at 10,000 rpm for 10 min at 4 °C. Finally, 500 µL of the supernatant was transferred into a 5 mm NMR tube (NORELL, #S55 SECURE SERIES) for analysis.