Uridine diphosphate

Uridine diphosphate, abbreviated UDP, is a nucleotide diphosphate. It is an ester of pyrophosphoric acid with the nucleoside uridine. UDP consists of the pyrophosphate group, the pentose sugar ribose, and the nucleobase uracil.

UDP is an important factor in glycogenesis. Before glucose can be stored as glycogen in the liver and muscles, the enzyme UDP-glucose pyrophosphorylase forms a UDP-glucose unit by combining glucose 1-phosphate with uridine triphosphate, cleaving a pyrophosphate ion in the process. Then, the enzyme glycogen synthase combines UDP-glucose units to form a glycogen chain. The UDP molecule is cleaved from the glucose ring during this process and can be reused by UDP-glucose pyrophosphorylase.

4-methylumbelliferone (4-MU), a small competitive inhibitor of Uridine diphosphate (UDP) with the ability to penetrate the blood-brain barrier (BBB), inhibited glioma cell proliferation in vitro and in vivo. Thus, approaches that interfere with Hyaluronic acid metabolism by altering the expression of HAS3 and CD44 and the administration of 4-MU potentially represent effective strategies for glioma treatment [1)].

1)
Yan T, Chen X, Zhan H, Yao P, Wang N, Yang H, Zhang C, Wang K, Hu H, Li J, Sun J, Dong Y, Lu E, Zheng Z, Zhang R, Wang X, Ma J, Gao M, Ye J, Wang X, Teng L, Liu H, Zhao S. Interfering with hyaluronic acid metabolism suppresses glioma cell proliferation by regulating autophagy. Cell Death Dis. 2021 May 13;12(5):486. doi: 10.1038/s41419-021-03747-z. PMID: 33986244.