

5-amino-1MQ

What is 5-amino-1MQ?

Researchers at the University of Texas first characterized 5-amino-1MQ (5-amino-1-methyl quinolinium) in 2017 while searching for ways to inhibit nicotinamide-N-methyltransferase (NNMT). NNMT is an enzyme that is highly active in fat tissue and key to cellular metabolism and energy homeostasis. Notably, the enzyme has been linked to obesity and type 2 diabetes (T2D). The researchers thus hypothesized that blocking NNMT could open a novel path to treating obesity and its metabolic complications.

5-amino-1MQ is a small, membrane-permeable molecule with a chemical formula of $C_{10}H_{11}N_2^+$. By inhibiting NNMT, 5-amino-1MQ improves glucose clearance from the blood and enables cells to more rapidly use available energy, reducing glycogen and fat deposition.

The NNMT-blocking mechanism of 5-amino-1MQ has been shown to increase levels of the cofactor NAD^+ , whose replenishment in organisms promotes muscular, cognitive, and immune function, as well as increased lifespan.

In a 2021 study in obese mice, 5-amino-1MQ administration caused significant body mass reductions in the rodents, who achieved body composition and liver adiposity parameters that were comparable to the lean mice in the control group. The study authors reinforced the idea that NNMT inhibition could potentially treat obesity and related metabolic comorbidities.

5-amino-1MQ has yet to enter clinical trials and accordingly is yet to be approved for human use by the United States Food and Drug Administration ("USFDA"). At this time, 5-amino-1MQ is available to qualified researchers for in vitro testing and laboratory experimentation only.

Benefits of 5-Amino-1MQ

While there are encouraging test tube and animal studies into the effects of 5-amino-1MQ, it is important to note that we still lack quality data in humans. Future research is expected to shed more light into the potential benefits and uses of this NNMT inhibitor.

For now, 5-amino-1MQ appears to be a promising candidate for treating the following:

5-Amino-1MQ for Weight Loss

By blocking NNMT, 5-amino-1MQ increases availability of NAD^+ and influences metabolic processes that rely on this cofactor. This allows the body to burn more calories and suppress storing additional glycogen and fat deposits. Research shows that increased NNMT is strongly associated with obesity, so targeting this enzyme could be beneficial for weight loss. High activity of NNMT is also correlated with lower levels of glucose transporter 4 (GLUT4), which is vital for glucose uptake from the bloodstream into fat and muscle cells. When glucose transport is impaired, the body stores glycogen and fat because it cannot use all the energy, resulting in weight gain. Subjects with high levels of GLUT4 have a "faster metabolism," and their bodies burn more calories. The production of this transporter can be increased through exercise. However, this remains challenging for many obese individuals.

5-amino-1MQ not only works to reduce NNMT but increases GLUT4 transporter expression. This result is improved glucose clearance from the blood, which supports energy metabolism and reduces fat storage. In a seminal study in diet-induced obese mice, 5-amino-1MQ administration led to a 35% reduction in mass and size, a 30% decrease in adipocyte size, and a 40% decrease in adipocyte volume in the rodents. In addition, the treated mice showed cholesterol

levels that were comparable to those of healthy mice. These findings were not attributed to variations in food intake, which implies that the observed results were mediated by alterations in metabolic processes.

5-Amino-1MQ for Diabetes and Metabolic Disorders

NNMT is a potential biomarker for reduced insulin sensitivity, since higher activity of this enzyme has been linked to insulin resistance and type 2 diabetes. Inhibition of NNMT may thus improve glucose tolerance and insulin sensitivity. One study investigating these effects in obese mice discovered that administration of an NNMT blocker reduced insulin serum levels by 50-60% in the subjects. In addition, the mice experienced significant fat loss, reduced adipocyte size and volume, and decreased triglycerides and free fatty acids. These findings highlight the potential of 5-amino-1MQ peptide therapy as a blood sugar management tool in diabetic and prediabetic individuals.

5-Amino-1MQ for Muscle Repair

Since 5-amino-1MQ inhibits NNMT in skeletal muscle and enhances the activity of GLUT4, the molecule may represent a promising intervention to improve workout capacity and physical performance. Scientists are investigating how 5-amino-1MQ can affect stem cells and muscle repair. In a study in old mice, NNMT inhibition was shown to promote stem cell activation following injury. The 5-amino-1MQ-treated mice experienced a two-fold increase in myofiber size and cross-sectional area distribution. In addition, the 5-amino-1MQ group had 70% stronger contractile force in healed muscle compared to the control.

Higher NNMT levels have also been observed in patients with some forms of muscular dystrophy. Scientists believe that inflammation linked to these conditions is what drives the increase of NNMT. An NNMT inhibitor like 5-amino-1MQ could help by stimulating the synthesis of NAD⁺, a vital cofactor in the electron transport chain. In addition, it appears that NAD⁺ protects muscles from metabolic and structural degeneration.

5-Amino-1MQ Side Effects

5-amino-1MQ has the potential to support weight loss by increasing energy metabolism and reducing fat storage. However, it is important to be aware of the molecule's safety profile and potential side effects before administering it to test subjects. While there is no data to establish the safety of 5-amino-1MQ in humans, rodent studies have found no significant adverse effects.

Considering that most current pharmacological treatments of obesity are linked to major side effects, the preclinical research into 5-amino-1MQ looks promising. Independent researchers have reported that taking 5-amino-1MQ too late in the day may result in difficulty with falling asleep. It has also been reported that 5-amino-1MQ treatment requires an acclimation period, with some subjects reporting decreased exercise tolerance with cardiovascular exercise. Given the limited safety information available on 5-amino-1MQ, researchers must consider excluding certain groups from their trials until we have more pre-clinical and clinical data. This would include pregnant and breastfeeding subjects, those with chronic conditions, and those taking medications that can interact with 5-amino-1MQ.

Dosage

One 50mg capsule daily.

Cost

American Wellness Pharmacy (AZ, CO, FL, NV, UT)

- \$10/capsule plus \$15 shipping

American Wellness Pharmacy (All other states)

- \$10/capsule plus \$30 shipping