Aicar and GW1516 – AICA Ribonucleotide

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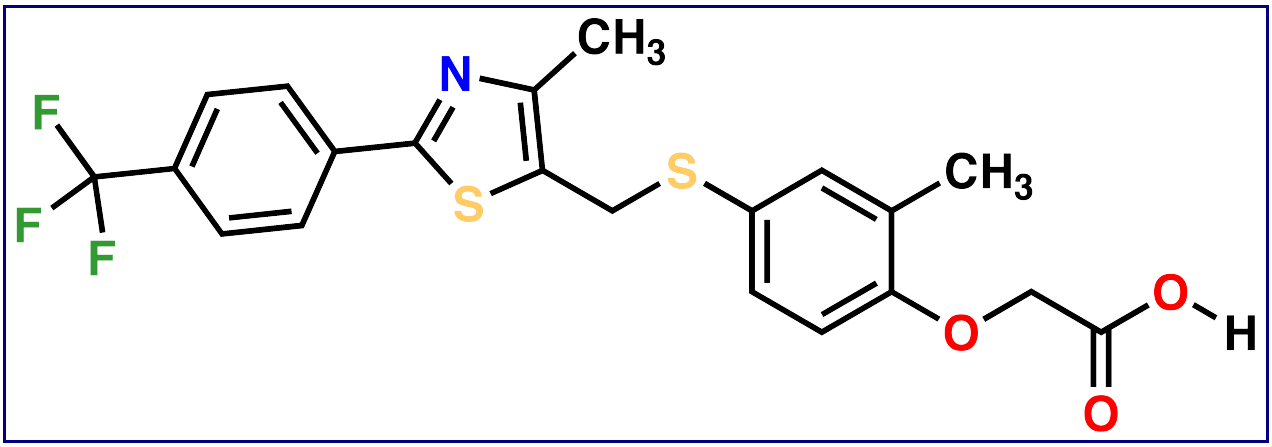
GW1516 may be sold under the name GW501516, GSK-516, GW-501, 516 and Endurobol. This chemical activates similar pathways that would be activated during exercise which is being researched for its potential use in treating cardiovascular disease, obesity, dyslipidemia and diabetes in animals. During research GW1516 is often given in applications, alongside aicar, to further increase the animal's endurance. While this chemical is still readily used in research, it has not been approved for mainstream use, because it has been found to significantly increase the risk of cancer in rats.



A chemical bond structure related to GW501516 and Aicar

Aica-ribonucleotide or aicar helps to stimulate kinase activity that is AMP-dependent. Originally research focused on using aicar as a potential way to ensure an adequate supply of blood to the body during heart surgery, but potential side effects limited these results. Currently most research for this chemical focuses on aicar's potentially applications in altering animal's physical muscle composition and increasing metabolic activity in the tissues.

GW1516 Modes of Action

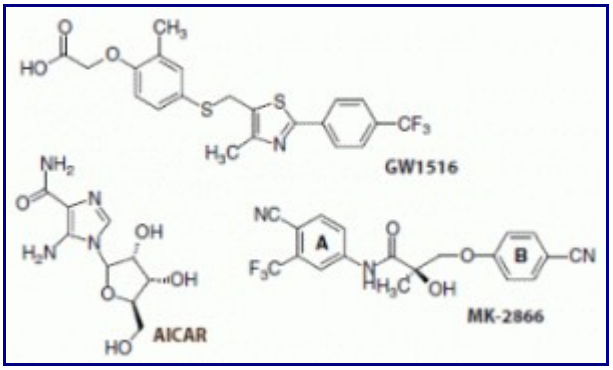
GW1516 acts as a selective antagonist which is known for displaying a high potency and affinity when applied to animal subjects.

- When this peptide is applied to rats it recruits the PPARGC1A complex as a coactivator. In turn, this will upregulate protein expressions that are used in energy expenditure.
- Rats that were exposed to synthesized GW1516 also displayed an increase in their fatty acid metabolism within their skeletal muscle. This helped to protect these

animals from type II diabetes and obesity, triggered by a specialized diet that induced these conditions in control rats.

Rhesus monkeys that were exposed to GW1516 in similar studies saw a significant increase in high-density lipprotein or HDL while very low density lipoproteins or VLDLs saw a significant decrease. This is theorized to be due to the activation of the PPARGC1A agonists, which increase the expression of cholesterol transporters.

Mechanisms of Aicar



Click here for a larger version of these aicar bonds

Aicar moves into cardiac cells in order to inhibit adenosine deaminase and adenosine kinase.

- The natural version of this chemical allows an animal's body to enhance its rate of nucleotide re-synthesis while increasing the adenosine generation that forms from adenosine monophosphate that occurs during myocardial ischemia.
- Within cardiac myocytes aicar will be phosphorylated into aica-ribotide which allows the animal to activate AMPK without needing to alter the levels of necleotides.

The development of aica-ribotide encourages these chemicals to enter de novo synthesis pathways, encouraging adenosine synthesis. This will inhibit adenosine deaminase which causes the ATP levels to increase. Adenosine levels will also increase with this application.

A specific application size for combinations of GW1516 and aicar has not yet been determined, nor has the increased risk of side effects in larger applications. Taking care to note side effects in animal test subjects is essential for those that are planning a long term application plan for continuing research.

A useful resource:

http://en.wikipedia.org/wiki/GW501516

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