AOD 9604 Research

**AOD 9604 STRUCTURE**
Scientists hypothesize that different parts of the hGH molecule may possess different properties and induce different effects in test models.[3] It has been suggested that only the last 15 amino acids may mediate any fat-burning potential of the hormone. The fragment was initially named hGH 177-191 and was subsequently modified by adding tyrosine to create AOD 9401, potentially to help stabilize the molecule. This modification led to the production of a 16-amino acid fragment called AOD 9604.[4] Interestingly, the researchers comment, *“AOD 9604 does not interact with the hGH receptor.”* This modification may have made the hGH Fragment 176-191 relatively more stable than other peptides.

**AOD 9604 MECHANISM OF ACTION**
AOD 9604 has mainly been studied in murine models, and significant experiments have involved relatively large amounts of AOD 9604.[5] These experiments reportedly resulted in a 50% reduction in weight following exposure to the research models. However, it is important to note that the fragment appears to lack any other associated action of hGH, such as a potential increase of IGF-1 (insulin-like growth factor-1), insulin resistance, or cell proliferation. Therefore, the compound may not possess the potential muscle-preserving and anabolic action typically associated with growth hormones. Nevertheless, it appears that AOD 9604 may stimulate weight loss through mechanisms similar to hGH, as it may trigger various cellular pathways that might lead to the release of fatty acids from adipose cells.

Additionally, researchers have posited that the peptide may affect the activity of lipases, a group of enzymes that prevent the return of fat to adipose tissues.[6] It is worth noting that AOD 9604 does not appear to affect natural hGH production and does not appear to act as a growth hormone secretagogue. Moreover, it does not appear to impact hunger hormone signaling to either increase or decrease appetite. Murine models comparing AOD 9604 and hGH have reported different outcomes in lean and obese cases.[4] In lean murine models, hGH appears to increase lean body mass, whereas AOD 9604 or a placebo did not appear to produce the same action. Hence, researchers have speculated that AOD 9604 may not be effective in increasing the size of muscle cells and contributing to muscle hypertrophy. However, in obese murine models, both hGH and AOD 9604 appear to exert a weight loss potential. The scientists also commented that there was an apparent 40% reduction in adipose tissue in the hGH group compared to 28% with AOD 9604.

Therefore, experiments suggest that AOD 9604 may hold reduced potential compared to hGH in stimulating the release of fats from adipose cells.[7] The researchers also posit that *“the lipolytic actions of both hGH and AOD 9604 are not mediated directly through the β3-AR although both compounds increase β3-AR expression, which may subsequently contribute to enhanced lipolytic sensitivity.”* Growth hormone likely promotes a greater release of fats from adipose cells due to its proposed impact on insulin resistance. By reducing glucose uptake, it may force cells to potentially utilize more fat instead. In contrast, the fragment AOD 9604 does not appear to increase insulin resistance. Additionally, anecdotal data suggests that AOD 9604 may potentially offer some impact, including modest improvements in cholesterol levels and insulin sensitivity, but it is yet to be confirmed by murine models.

**AOD 9604 AND OBESITY**
AOD 9604 has been brought into clinical trials with the objective of targeting obesity using a peptide similar to hGH. Phase 2b clinical trials conducted on 300 obese test subjects in Australia observed that the peptide appeared to result in consistent weight loss over 12 weeks when introduced once daily.[8] The rate of weight reduction in test subjects was consistently compared to the placebo cohort, and weight loss appeared to hold steady over the entire study period. This observation indicated that the peptide is unlikely to generate resistance, and thus continued influence of the peptide might result in a pronounced effect. Study in this area is ongoing. Researchers have also utilized mice models to explore the underlying mechanism of AOD 9604.

An initial hypothesis proposed that AOD 9604 may bind and activate β-3-adrenergic receptors, which are present on the surface of white adipose tissues. Upon binding to the cognate receptors, the peptide may trigger downstream signaling, which may mobilize the fat cells from storage mode to a usable state by enhancing the rate of metabolism. Interestingly, mice genetically mutated in β-3-adrenergic receptors underwent fat loss, possibly through apoptosis of the white adipose tissues.

**AOD 9604 AND CARDIAC DISEASE**
AOD 9604 may host the potential to improve cardiac function indirectly by mobilizing fat and reducing obesity. The peptide may reduce the chances of cardiac disease induced by obesity. Apart from its proposed principal function of decreasing fat burden, research teams have suggested other mechanisms by which the peptide might improve cardiac conditions. These pathways are independent of β-3-adrenergic receptors and appear to improve general metabolism, improving cardiac function.[9]

**AOD 9604 AND JOINTS**
Research suggests that AOD 9604 may influence arthritic joints in rabbits, and may have contributed to an improvement in pain perception and decreased movement disability.[10] Researchers have speculated that AOD 9604 may promote the growth of cartilage tissue in the arthritic joints but have yet to fully investigate this hypothesis. Experimental examination and microscopic cartilage structure analysis in affected joints have indicated positive results upon AOD 9604 influence in osteoarthritis test subjects.

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