Myostatin and its Possibilities

Myostatin belongs to a family of molecules called transforming growth factors beta (TGF-b). It is also called (GDF-8) growth and differentiation factor - 8. TGF-b subtypes are based on their related structures. GDF is one of these structures which specifically regulates growth and differentiation. Now, myostatin has been found in different types of muscle in several different mammals, including humans.

Myostatin plays a role in prenatal muscular growth. It has an effect on the number of muscle fibers that one has. When myostatin is eliminated or blocked, extreme muscle growth results. Follastatin, mutant activin type II receptors, and myostatin propeptide can block the activity of myostatin. A lot can be done with this. Primarily, muscle regeneration is an important possiblilty. High levels of myostatin have been detected in HIV-infected men in comparison to healthy males. This does not necessarily mean that myostatin is a factor in muscle wasting, but blocking myostatin could result in muscle regeneration.

Secondly, myostatin could lead to a big change in the cattle industry. By adding myostatin blocking proteins, a higher quantity of much leaner meat could be produced. In 1997 Mcpherron and Lee from John Hopkins University discovered the myostatin gene, also nicknamed the " Schwarzenegger Gene ", that could be responsible for abnormal muscular growth in cattle. Experiments where the genes were mutated in Belgian Blue and Piedmontse cattle led to increased muscularity. Gains of up to 30% above normal levels of muscularity have been shown in cattle that experienced myostatin mutations. Shortly after the discovery of the myostatin gene in cattle the gene was discovered in mice. Mutation of the gene in mice resulted in 200-300% increases in muscle mass. Scientists have been able to completely eliminate myostatin and have been able to block it. The mice with high levels of follastatin were just about the same size as the mice with no myostatin at all. The cattle and mice both lived healthy lives despite being musclebound. The studies showed us that myostatin had the same biological function in cattle and mice. These discoveries led to further investigations of the myostatin gene in other mammals. Recent reports state that KFC is working on producing larger chickens through myostatin mutation. Sources also say that McDonald's is working on a supercow that is six times larger than normal cows. These reports are only rumors but it is entirely possible.

The next step is to implement this in humans. For muscle wasting diseases, it could be very effective. It is questionable if myostatin could be blocked postnatally in humans. Myostatin inhibition could be a simple way to add muscle without dangerous medications. However, federal funding has been a problem. University studies (especially John Hopkins University) have come a long way in this field. There are numerous studies amongst humans and it seems entirely possible. Natural mutations have also been investigated. Some extremely talented bodybuilders were found to have myostatin mutations. Although this is more genetic engineering, it could make a big impact on the medical and food industries. By John Coughlin