



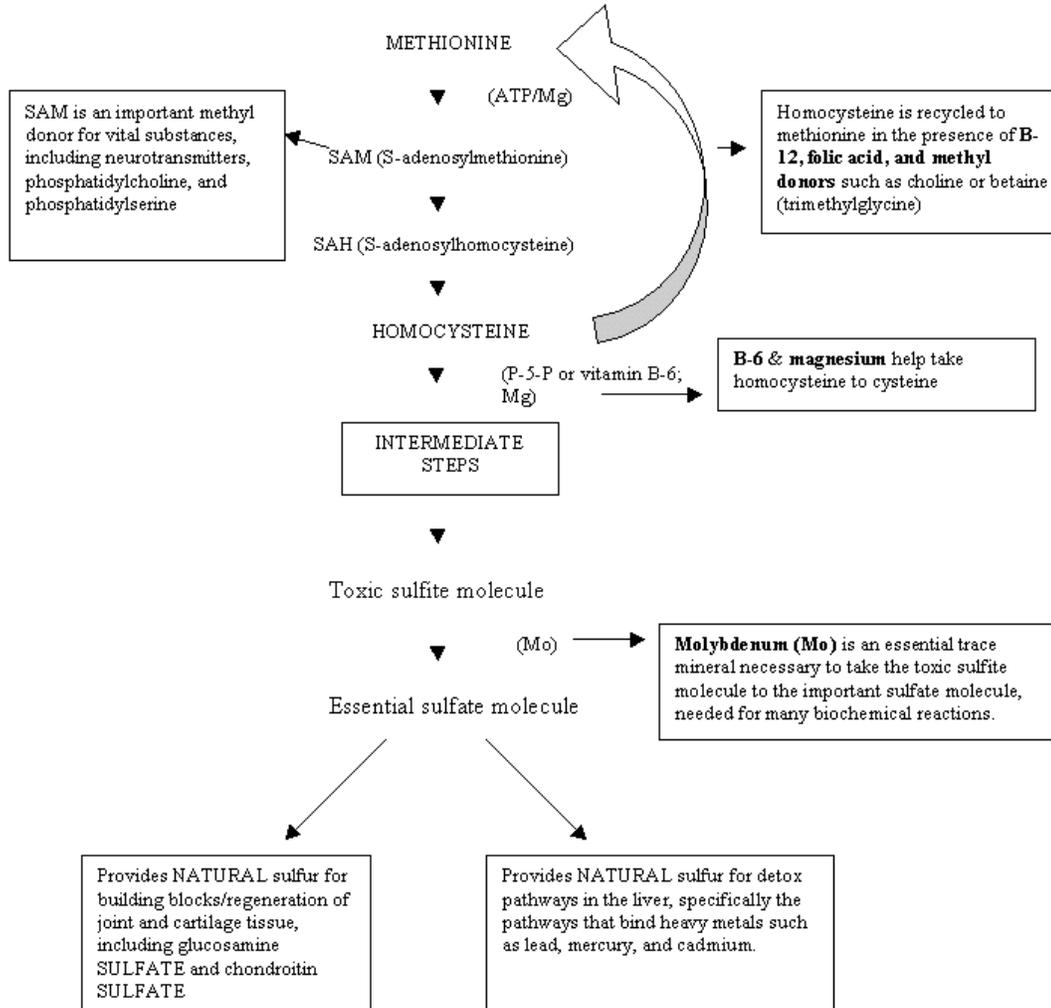
HOMOCYSTEINE REDUX vs MSM

Sulfur supplementation has become popular, because sulfur is such an important element that is utilized in many reactions, especially those involved with joint/cartilage repair and liver detox pathways. The question is, what is the best source of sulfur?

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HOMOCYSTEINE REDUX vs MSM



Products such as MSM (methylsulfonylmethane) have surfaced on the market to provide an outside source of sulfur that in turn may hopefully be incorporated into the body and utilized for all the reactions and building blocks requiring sulfur. As you can see from the above diagram, when the homocysteine pathway is functioning correctly, the end-product is **NATURAL** sulfur, which is manufactured **IN** the body and is already endogenously (inside) present for beneficial results.

Additionally, resources such as Jonathan Wright, MD point out that MSM can create a molybdenum deficiency because exogenous, (outside) sources of sulfur will drain molybdenum resources because the molybdenum is essential for sulfur metabolism. On the contrary, **NATURAL** provision of sulfur makes what the body needs, and does not create an excess pool which then must drain molybdenum to be metabolized.

Additionally, the product that was formulated to optimize the correct functioning of the homocysteine pathway (Homocysteine Redux) contains **ALL** of the necessary, synergistic nutrients (including molybdenum) to ensure that all the reactions that depend on the homocysteine pathway are optimized.

These reactions include: 1. The synthesis of building blocks for cartilage/tissue repair that depends on the natural sulfur molecule; 2. The liver detox path that utilizes sulfur to detox insults to the system (especially metals such as lead, mercury, and cadmium); 3. The methyl donations from SAM

(S-adenosyl methionine), which are used for the synthesis of neurotransmitters, and essential cell components such as phosphatidylcholine and phosphatidylserine. SAM has also been used by itself as a nutritional supplement, but look at the pathway - unless you have all the necessary ingredients to optimize the efficiency of the whole pathway (nutrients that are in Homocysteine Redux), SAM can metabolize to the toxic homocysteine in just two more metabolic steps!

There is another reason that addressing the correct functioning of the homocysteine pathway is important - if the necessary nutrients are not present, homocysteine can build up and become toxic. A synergistic balance of the nutrients can recycle homocysteine to methionine to avoid toxicity (vitamin B-12, folic acid, and methyl donors such as choline or betaine (trimethylglycine). Reducing homocysteine levels has been associated with reducing the risk for a whole host of conditions, from heart disease to osteoporosis, and MSM doesn't have that claim associated with it. Excess homocysteine is implicated in the following conditions:

Osteoporosis

Folic acid, one of the B vitamins used to lower homocysteine levels, is suggested as a useful supplement to prevent osteoporosis which may have been caused by high homocysteine levels (Metabolism 1989;38:734-739).



Osteoarthritis

Chondroitin sulfate, glucosamine sulfate, N-acetyl glucosamine, hyaluronic acid, and mucopolysaccharides are all building blocks of cartilage, and they are all dependent upon sulfur groups for complete synthesis of healthy cartilage tissue. These sulfur groups are provided by a correctly functioning homocysteine pathway.

Cardiovascular disease

The New England Journal of Medicine reported that homocysteine was THE strongest modifiable predictor of overall mortality among patients with coronary artery disease (NEJM 1997;337:230-236).

Neural tube defects

It is well-known that supplementation of folic acid can reduce the risk for neural tube defects. What is less well known is that the mechanism could be that it is reducing risk by reducing elevated homocysteine levels.

Preeclampsia

Preeclampsia is the leading cause of maternal and perinatal mortality in industrialized countries, and usually stems from damage to the thin layer of endothelial cells lining the blood vessels. Women with preeclampsia or who had given birth to low-birth weight babies were shown to have much higher levels of homocysteine than the general population (Am J Obstet Gyn 1998;179:135-39).

Depression

Homocysteine nutrients, which include the B vitamins, are related to depression in several ways (Fava, M et al., Folate, B-12, and homocysteine in major depressive disorder. Am J Psy 1997;154:426-428). The methyl group metabolism provided for by the pathway of homocysteine (correctly-functioning) is necessary for the production of depression-relieving neurotransmitters such as serotonin and dopamine. The B vitamins are also crucial in the direct synthesis of the brain neurotransmitters. Aside from the fact that they are needed (especially B-6, B-12 and folate) for the homocysteine pathway to provide methylation, they are essential to the pathway of these neurotransmitters (J Affect Disord. 1986;10:9-13; Psychosomatics. 1980;21:926-929).

Alzheimer's

High homocysteine levels have been linked to Alzheimer's disease, probably because of some correlation with the development of the neurofibrillary tangles involved in the condition that are thought to block oxygen from reaching the nerve cells and making them unable to produce acetylcholine, the brain neurotransmitter necessary for thought processes.

Multiple Sclerosis

Multiple sclerosis has been linked to high homocysteine levels. High homocysteine levels interfere with the synthesis of SAM, and thus interfere with methyl donations for neurotransmitters, which are essential for nerve conduction in MS patients. MS patients need the sulfur provided by the pathway for joint and cartilage repair, and even more importantly, for the detox pathways in the liver, since the sulfur detox pathway binds metals such as mercury, lead, and cadmium, and MS patients are especially susceptible to these metals and cannot detox them well. To add insult to injury, the metals exert their toxicity in the body by robbing essential proteins of their sulfur groups so that they can't function; this means that in addition to not being able to detox the metals well, the exposure to metals robs their

bodies of much needed proteins for cell rebuilding, and also proteins in key enzymes. The ill-effects of heavy metal toxicity include the neurotoxic damage associated with MS. The ill-effects of heavy metal toxicity include the neurotoxic damage associated with MS. Mercury amalgams have long been associated with the symptoms of MS - Multiple sclerosis patients have been found to have up to eight times higher levels of mercury in their CSF than neurologically healthy controls (Denton, Sandra, M.D., The Mercury Cover-Up: Controversies in Dentistry, Townsend Letter For Doctors, July 1990;488-491).

Other Conditions

Other conditions which have been linked to high homocysteine levels include: rheumatoid arthritis, spontaneous abortion, placental abruption, renal failure, and type II diabetes.

It is easy to see that high homocysteine levels dramatically increase the risk for many conditions. A nutritional product which offers reduction in risk for all of these conditions and more is a claim that MSM can't make, because it only provides an outside source of sulfur, and that's it. It is an expensive source at that. MSM supplements are not cheap. Providing necessary sulfur groups the natural way, through complete metabolism of the homocysteine pathway, still seems to be the most efficient and economical route. This route also provides for natural production of SAM, and prevents the buildup of homocysteine and its toxic effects and resulting diseases. The complete list of ingredients covers all the bases; the list includes: vitamin B-12, folic acid, pyridoxal-5-phosphate (active form of B-6), betaine (trimethylglycine), dimethylglycine, niacinamide, choline, molybdenum, magnesium, and zinc. The choice appears easy: an outside source of sulfur which may deplete molybdenum stores (MSM), OR a complete, synergistic formula which is less expensive, provides an endogenous source of sulfur (along with necessary nutrients such as molybdenum), and provides a natural source for SAM.

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