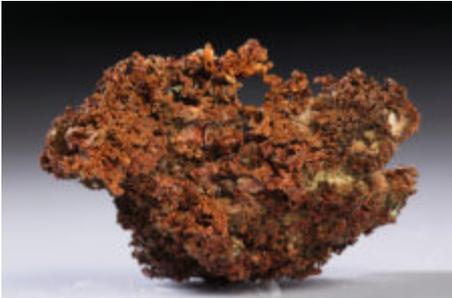


A New Solution for Obesity — Copper



By Ruth Kava — June 7, 2016



Copper Ore via [Shutterstock](#) [1]

No, it's not those copper bracelets folks are wearing for arthritis — nothing magical is involved. And we don't really think that copper, in and of itself, is going to halt the obesity epidemic. But a new [study](#) [2] provides an intriguing look at the role that copper may play in the regulation of fat storage in the body.

Senior author Dr. Christopher J. Chang from UC Berkeley and colleagues used mice that have a genetic mutation that causes copper accumulation in the liver. Humans have a similar condition — Wilson's disease — that can be fatal if not treated.

These mice not only have an abnormal copper load in their livers, they also have less lipid (fat) in their liver than would be expected. However, these mutant mice also have more general body fat than normal mice.

The coincidence of these conditions intrigued Dr. Chang and his co-workers, and they found that the mutant mice also had lower levels of copper in their adipose (fat) tissue. Continuing their investigation, they treated these mice with isoproterenol, which is known to induce the breakdown of fat into fatty acids (lipolysis). But the mice with Wilson's disease had a lower response than did normal mice.

The researchers then examined adipose cells in culture, they found that copper binds to the enzyme PDE3, which in turn binds to cyclic AMP (cAMP), an intracellular messenger. cAMP facilitates fat breakdown — when PDE3 binds to cAMP, cAMP is inactivated. But if copper isn't available, PDE3 doesn't bind cAMP, and lipolysis is halted. Thus fat in the cell isn't broken down, and the fat depots enlarge.

Now it's a far cry from mutant mice and cell culture to normal humans. But this research demonstrates the varied roles that nutrients play in regulating metabolism. The recommended dietary intake of copper is just 700 ?grams per day — less than one milligram. Although one might think (and surely supplement makers will jump on this) that the more copper one takes, the more fat you'd break down, but that is a dangerous proposition. Excess copper can interfere with the metabolism of zinc, another essential mineral, so jumping to additional copper intake can be

dangerous.

Eventually, we can hope, such research results will indeed help us find a way to decrease the body burden of excess fat, but that's still a long ways off.

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