Acetaminophen is the most widely used painkiller and fever reducing medicine used throughout the world. In the United States, acetaminophen, available as Tylenol®, is easily obtainable and recommended to everyone, including infants, without any strong warning about its toxicity. Acetaminophen is a component in more than 600 different medications and thus has the highest potential for accidental overdose in people who take several medicines. Acetaminophen poisoning is also the most common cause of acute fulminant liver failure.

We conducted an in vivo study testing the protective effects of a specific combination of micronutrients against liver and kidney damage caused by an acute administration of acetaminophen. In the experiments we used two groups of mice: the test group received micronutrient supplementation for two weeks prior to the acetaminophen administration and the control group was fed a normal diet. In order to assess organ damage we measured the levels of enzymes indicative of liver function (AST, ALT and alkaline phosphatase) and specific markers of kidney function (blood urea nitrogen (BUN) and creatinine).

While the markers indicative of liver damage were significantly increased in the control group of mice, the mice given the micronutrients showed a substantial reduction in them. For example, AST was 87% lower in the micronutrient supplemented mice than in the control group, ALT was 82% lower and alkaline phosphatase was 53% lower, thus indicating less liver damage. Similarly, kidney damage, as indicated by function tests including BUN and BUN to creatinine ratio, was reduced by 38% and 32% respectively in the supplemented groups, thus confirming the protective effects of this specific combination of micronutrients against kidney damage by acetaminophen.