

Antioxidant may protect offspring of obese mothers from fatty liver disease

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In new research published online in *The FASEB Journal*, scientists show that the antioxidant pyrroloquinoline quinone (PQQ) may prevent the development of nonalcoholic fatty liver disease in offspring. The research, which used mice, is the first to demonstrate that PQQ has this type of protective effect. PQQ is a naturally occurring antioxidant found in soil and foods, such as soy, parsley, celery, kiwi, and papaya, and is also present in high quantities in human breast milk.

"Nonalcoholic [fatty liver disease](#) is the most common [liver disease](#) worldwide, and affects approximately 35 percent of [obese children](#) in North America alone. Despite its growing prevalence, no effective treatment exists to date," said Karen R. Jonscher, Ph.D., a researcher involved in the work at the Department of Anesthesiology, University of Colorado Anschutz Medical Campus, in Aurora, Colorado. "Our results suggest that supplementation with PQQ, particularly during pregnancy and lactation, might help slow the advancing epidemic of NAFLD in the next generation."

To make their discovery, Jonscher and colleagues fed mouse mothers a normal diet or one with high amounts of fat, sugar, and cholesterol as is typical of human Western-style diets. The researchers then provided a subset of mice from each diet group with supplemental PQQ in their drinking water. Their offspring were kept on the same diets and PQQ into early adulthood, except for one group that had PQQ supplementation discontinued at weaning (3 weeks of age). Offspring fed the high-fat, -sugar, and -cholesterol diet gained more weight than

mice fed a normal diet, and PQQ did not change the amount of weight gain. Those with PQQ supplementation, however, did have less fat in their livers, even before they were born, and PQQ prevented the accumulation of damaging fats in the liver, despite continued consumption of the experimental diet. This was associated with reduced inflammation and was found in the mothers that had only been exposed to PQQ during pregnancy and lactation.

"While this intriguing study leaves open the question of whether the effects are intrauterine or transgenerational-epigenetic in character (or both), the potential relevance to human pre- and postnatal obesity is clear," said Thoru Pederson, Ph.D., Editor-in-Chief of *The FASEB Journal*. "This work sets specific issues in play for follow-up studies."

More information: K. R. Jonscher et al, Early PQQ supplementation has persistent long-term protective effects on developmental programming of hepatic lipotoxicity and inflammation in obese mice, *The FASEB Journal* (2016). [DOI: 10.1096/fj.201600906R](https://doi.org/10.1096/fj.201600906R)

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