

Study suggests promising new Rx target for obesity and diabetes

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Research led by Suresh Alahari, Ph.D., Fred Brazda Professor of Biochemistry and Microbiology at LSU Health New Orleans, suggests a novel protein may be a promising therapeutic target to treat or prevent metabolic disorders. The study also reported for the first time metabolic distinctions between male and female mice. The findings are published in the December 2018, issue of the *International Journal of Obesity*.

The researchers conducted studies in both a [mouse model](#) and in [human tissue](#) to advance our understanding of the role of Nischarin, a novel protein discovered by the Alahari lab, in [fat distribution](#) and insulin resistance leading to diabetes and obesity. Nischarin functions as a molecular scaffold and is involved in the insulin signaling pathway.

"Nischarin disruption resulted in insulin resistance in [female mice](#), but not in male mice, suggesting that Nischarin protects against diabetes in females," notes Dr. Alahari. "Our human data indicate that Nischarin expression is suppressed in fat tissue of obese humans. Higher expression of Nischarin correlates with lower BMI and improved glucose and lipid metabolism."

Working with experimental Nischarin-mutant as well as wild mice fed chow and high-fat diets, the researchers found gender differences in body fat distribution, increased insulin resistance and decreased glucose tolerance in the females.

To link the work in mice with [human disease](#), the scientists also studied

paired samples of human subcutaneous and visceral fat that were obtained from 400 individuals (267 women, 133 men), ranging in age from 19 to 93 years, with BMIs from 18.9 to 78.9 kg/m². The research team found that Nischarin expression was lower in both visceral and subcutaneous adipose tissues of individuals with obesity. The majority of parameters associated with obesity—impaired glucose and lipid metabolism as well as [insulin resistance](#)—were inversely correlated with Nischarin expression, as were weight, waist circumference and waist-hip ratio. They also found that Nischarin expression was higher in the visceral fat.

According to the Centers for Disease Control and Prevention, the age-adjusted percentage of US adults who were obese or had been diagnosed with diabetes rose in all states from 1994-2015. "In 1994, all but two states had prevalence of obesity less than 18% and no state exceeded 22%. In 2015, no state had less than 18% and all but one state exceeded 22%. Similarly for diagnosed diabetes, in 1994, no state had prevalence less than 6.0%. In 2015, all states exceeded 6.0%; 27 of these exceeded 9.0%."

"Understanding how Nischarin in adipose tissues influences metabolic dysfunction might warrant a new paradigm in metabolic studies," Alahari concludes.

Besides LSU Health New Orleans School of Medicine, participating institutions included the University of Leipzig in Germany and Tulane University School of Medicine.

More information: Shengli Dong et al, Development of insulin resistance in Nischarin mutant female mice, *International Journal of Obesity* (2018). [DOI: 10.1038/s41366-018-0241-8](https://doi.org/10.1038/s41366-018-0241-8)

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