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Researchers study anti-obesity potential of SRC-1

After menopause, some women struggle to control their weight. A lack of estrogen plays a role in this problem, but serious side effects mean estrogen replacement is not an option for most women.

As an alternative, researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine are working with the molecule steroid receptor coactivator-1 (SRC-1), which interacts with the estrogen receptor, to determine whether it may be helpful in controlling weight gain in postmenopausal women, premenopausal women and even men. Their report appeared in a recent issue of the journal *Endocrinology*.

SRC-1 is a member of a family of so-called coactivators that control many functions in the cell. SRC-1 was actually first identified in the laboratory of Dr. Bert O'Malley, chair of molecular and cellular biology at BCM.

The research of CNRC investigator, Dr. Yong Xu, focuses on how the brain controls body weight balance with the aim of developing novel ways to treat obesity in humans. Estrogen, the female sex hormone, plays an important role in protecting female animals from weight gain. The similar protection is also implicated in premenopausal women said Xu. When women lose natural estrogen, they lose that protection.

Xu, assistant professor of pediatrics at BCM, and colleagues wanted to understand the molecular mechanisms behind estrogen's protective effects against obesity. They are now focusing on SRC-1.

Previous research has shown that estrogen works in the brain through a receptor to prevent weight gain. In this study, Xu and colleagues found that the estrogen receptor physically interacts with SRC-1 in the brain to form a protein-protein complex. This complex becomes more

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How cooking and preparation impact benefits of blueberries

Blueberries have never been more popular, thanks to their widely reported health benefits, which include potentially decreasing cardiovascular risk factors, enhancing insulin sensitivity, improving cognition and more.



of Medicine, and his colleagues measured the levels of the beneficial phytochemicals in blueberries after putting them through a variety of cooking methods. In addition, they examined the bioactive potential of wild blueberry

extract after cooking, using a cell-based culture assay.

"The purpose of the study was two-fold," Grusak said. "Because blueberries are touted as such a health-beneficial food, we wanted to know the nutrient content of blueberries after consumers cook them in a number of ways. But researchers

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Study shows low levels of vitamin D in Hispanic infants

In a study that measured vitamin D levels in the umbilical cord blood of Houston-area infants, Hispanic infants were found to have lower levels of vitamin D than non-Hispanic Caucasian infants, according to researchers at the USDA/ARS

Children's Nutrition Research Center at Baylor College of Medicine. The report appeared in *BMC Pediatrics*.

"Although the vitamin D levels in Hispanic infants were low, the study did not show that the infants had any symptoms from these low levels, but the

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Kamp K'aana leads to reduced body fat, improved quality of life

As the seventh year of Kamp K'aana winds down, researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine continue to find benefits of the weight-management camp that promotes a healthy lifestyle in children and teens.

A recent study by Dr. William Wong, professor of pediatrics at the CNRC, showed that the two-week residential camp can help reduce body fat and improve quality of life in obese children. The study was published in the *Journal of Pediatric Gastroenterology and Nutrition*.

Previous research showed that the camp led to improved body weight; however, questions remained about whether the participants had lost lean muscle mass or body fat.

In this study, researchers measured changes in body composition and learned that camp participants' weight loss was indeed from body fat.

"It's important to reduce body fat but not lean muscle mass," Wong said. "Excess body fat is related to serious medical issues, such as diabetes. Muscle mass, on the other hand, is important for the body's metabolism to function properly."

The study included 42 obese boys and girls between the ages of 9 and 14 who were enrolled in Kamp K'aana in August 2010. Body weight, height and body composition were measured at the beginning and again at the end of the camp. In addition, participants completed a quality-of-life questionnaire at the beginning and end of camp.

The campers reported significant improvement in quality of life issues during the camp, including physical comfort, body esteem and social life.



The camp, a comprehensive and fun weight management program for children, is held at Cho Yeh Camp and Conference Center in Livingston, Texas. It was expanded this summer to include a session at the YMCA's Camp Cullen located in Trinity, Texas.

The camp offers fun activities such as swimming, horseback riding, zip lining, sports, ropes courses, a rock wall and more. In addition, for one hour a day children receive lessons from health educators on how to achieve a healthy lifestyle. A healthy meal plan including a new fruit or vegetable is served each day.

Parents take part in education sessions on the first and last days of camp. Additionally, families attend two follow-up reunions 3- and 6-months after camp to reconnect and reinforce lessons learned.

"The camp is very active and fun for the kids, and that's why, year after year, we are seeing improvements in their weight and self-esteem," said Wong, who developed Kamp K'aana along with CNRC and Texas Children's Hospital colleagues. "Many of the children have never done these activities before, and they also learn important lessons about nutrition and a healthy lifestyle."

This summer, two sessions of Kamp K'aana were held—one at the YMCA's Camp Cullen in Trinity, Texas, in June and the original Kamp K'aana at Cho Yeh Camp held in August.

Others who contributed to the study included Sarah Barlow, Carmen Mikhail, Theresa Wilson, Roman Shypailo, Stephanie Abrams and Paula Hernandez, all of Baylor College of Medicine.

Low Levels of Vitamin D CONTINUED FROM PAGE 1

fact that the levels are low is still worrisome," said Dr. Steven Abrams, neonatologist and professor of pediatrics at BCM.

Researchers analyzed cord blood in 49 Houston-area infants who were breastfed. Half were Hispanic and the other half were non-Hispanic Caucasians. Researchers measured vitamin D and bone density levels at one week of age. Currently, the recommended dose of vitamin D for infants is 400 international units per day.

They advised mothers to give their breastfed infant vitamin D drops and then repeated the measurements after three months. The infants had improved vitamin D levels and normal bone density growth.

"This shows us that giving vitamin D drops is what works," said Abrams. "It emphasizes the importance of giving vitamin D to babies and indicates that mothers should also be taking vitamin D."

Infants who are formula-fed do not usually need vitamin D supplementation because the formula already contains vitamin D. Physicians recommend vitamin D drops for all

breastfed infants until they start drinking vitamin D-fortified milk or formula. Mothers usually get vitamin D through prenatal vitamins, but they can discuss with their physician whether they should take additional vitamin D supplements during pregnancy.

Although none of the infants involved in the study showed any symptoms of vitamin D deficiency, it has been shown in other studies to be associated with low levels of serum calcium, which can lead to significant health problems related to the heart and brain.

"If a baby went without vitamin D for a long period of time, then that would be a problem," said Abrams.

Others who took part in the study include Keli Hawthorne, Stefanie Rogers and Penni Hicks from BCM and Thomas Carpenter from Yale University School of Medicine.

Funding for this study came from the USDA/ARS and the American Academy of Pediatrics.

See the full report at www.biomedcentral.com/content/pdf/1471-2431-12-6.pdf.

enriched when there is an estrogen stimulant. They also found that estrogen requires the SRC-1 protein to reduce body weight.

“In other words, SRC-1 can at least partially mediate the anti-obesity effects of estrogen, so it is a part of this mechanism,” said Xu.

This could mean that SRC-1 may be a better drug target for weight loss. Xu also found that SRC-1 interacts with many other nuclear receptors in addition to the estrogen receptor, meaning that it could enhance the function of other nuclear receptors related to obesity.

“This means it could provide a synergistic effect in terms of weight gain prevention,” said Xu.

Because this one compound may be able to be used to enhance multiple systems, Xu says that the efficacy will be better than if it only targeted one system.

Xu and colleagues are now studying the role of SRC-1 in mice. Because the coactivator interacts with multiple systems, they think it may also play a role in preventing weight gain in men.

“This compound could eventually be a drug that would help prevent weight gain, and we are excited to see where this research leads us,” said Xu.

Others who took part in the study include Liangru Zhu of the Huazhong University of Science and Technology in the People’s Republic of China and Yongjie Yang, Pingwen Xu, Fang Zou, Xiaofeng Yan, Lan Liao, Jianming Xu and Bert W. O’Malley of BCM.

Funding for this study came from the National Institutes of Health, the American Diabetes Association, the Klarman Family Foundation, the Naman Family Fund for Basic Research and the Curtis Hankamer Basic Research Fund.



Volunteers

Houston-area residents are invited to participate in the following nutrition research projects designed to help CNRC scientists learn more about the nutritional needs of children. Free parking is provided. Financial compensation is provided for most studies, and transportation may be available.

For more information on any CNRC study call Marilyn Navarrete, 713.798.7002, or e-mail rilynn@bcm.edu.



AVATAR

Researchers are looking for 12 to 14 year olds to help us develop a virtual reality game.

DIGITAL DIET STUDY

Enrolling 3 to 5 year olds for validation of dietary intake method using a cell phone camera. All meals provided with private room.

TEENS IN ACTION

11- to 13- and 15- to 17-year old boys and girls are needed for a study about physical activity. Teens will complete an online survey and wear a physical activity monitor for 7 days.

BREAKFAST STUDY

Children who are 8 to 10 years old are needed for a study on breakfast consumption and mental abilities. The study includes three overnight visits to the CNRC. There will be blood draws at each visit (numbing creams and sprays are available).

BUTTERFLY GIRLS

8- to 10-year old African American girls and a parent needed to participate in an eight week online program promoting healthy eating and physical activity. No meetings to attend. Participate from the comfort and convenience of home. Watch informative video: <http://www.bcm.edu/cnrc/butterflygirl/butterflygirlintrovideo.html>

CARDIOVASCULAR STUDY

13- to 18-year old adolescents and young adults (normal weight and overweight) with and without type 2 diabetes are needed for a research study investigating risk for heart disease in youth. Study involves body composition, heart scan and blood tests.

DIET AND STOMACH PAIN

Does your child have stomach pain that you believe is related to his/her diet? Children between the ages of 7 and 17 are needed for a research study. Researchers are interested in learning more about the role of diet in childhood stomach pain. Participants will be asked to start a specific diet on two separate weekends to determine whether this will help the pain. Food will be provided.

FATTY LIVER

11- to 21-year old overweight adolescents and young adults with and without liver disease are needed for a research study investigating risk for early heart disease in youth. Study involves body composition, liver scan and blood tests.

PREGNANCY & CHILD HEALTH

Did you have a pregnancy complicated by preeclampsia or a baby with low birth weight? Can a complicated pregnancy in mom put the child at risk for future health problems? To answer this question, we are conducting a research study that looks at pregnancy history and its effect on the child’s health. 8- to 11-year old children of both eclamptic and non-preeclamptic pregnancies are needed as well as 8- to 17-year olds of pregnancies with high blood pressure. Study involves body composition and blood tests.

PUBERTY & INSULIN RESISTANCE

Texas Children’s Hospital along with Baylor College of Medicine is recruiting study subjects to participate in research to see how weight and puberty influence sugar metabolism. We are seeking both lean and overweight children who are approximately 7 to 15 years old. The study requires two office visits in a research unit. A no-cost health exam will be included. Saturdays and Sundays are available for your visits.

STOMACH PAIN & GENETICS

Do you have a child age 7 to 18 with recurrent abdominal pain (stomach aches)? Do they have a brother, sister, step-brother, step-sister and/or adoptive sibling age 7 to 18 living at home with them? You may be eligible for a research study about the environment and genetics of stomach aches. We will visit your home and provide all materials needed for the study.

TEEN IBS & GUT BACTERIA

Researchers at Texas Children’s Hospital and Baylor College of Medicine are interested in learning about gut bacteria in healthy 13- to 17-year old adolescents and in those with chronic belly pain.

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Benefits of blueberries CONTINUED FROM PAGE 1

are also beginning to use blueberries in clinical trials, so the information we gained from this study will be important to help researchers design better studies.”

The study measured phytochemicals in blueberries that are known to have beneficial health impacts—anthocyanin (ANC), proanthocyanidin (PAC) and chlorogenic acid (CA)—after exposing the blueberries to common postharvest handling practices and culinary preparation methods. All of the blueberries used in the study were the quick-frozen wild type that are found in the freezer section of grocery markets and commonly used in processed foods.

The phytochemicals in individually quick frozen wild blueberries that had been subjected to temperature fluctuations, which are often encountered during distribution and handling for retail sale, were measured. The ANC, PAC and CA levels dropped by about 8, 43 and 60 percent, respectively, compared to quick-frozen blueberries that were stored continuously from harvest at -80 degrees Celsius. Baking, boiling and microwaving also reduced the levels of the compounds, with longer cooking times (e.g., 3 to 5 minutes of microwaving) leading to the biggest declines in the concentrations of these blueberry components.

Researchers also conducted cell-based assays to measure the antioxidant activity of blueberry extract after various cooking methods. Antioxidants help to fight oxidative stress, a contributor to certain human diseases. Only microwaving for five minutes had a detrimental effect on the antioxidant capacity of the blueberries. Antioxidant activity was not reduced when using shorter microwaving times, or baking or boiling.

“What we can say from this study is that cooking and heating, especially longer microwaving, does decrease the amount of beneficial compounds in the berries,” Grusak said. “Minimal cooking would be ideal, but there are still measurable levels of health-beneficial components in blueberries, even after a variety of preparations.”

The results also point to the need for researchers conducting future health-related studies involving blueberries to consider the methods in which they are preparing blueberries and the effects this has on the compositional attributes of the fruit at the time it is eaten.

Others who contributed to this study include Sally Gustafson, USDA/ARS at North Carolina Research Campus; and Gad Yousef and Mary Ann Lila, Plants for Human Health Institute, North Carolina State University. It was funded through the USDA/ARS.