Going deep to study exercise's molecular nitty-gritty

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About 120 scientists from around the U.S. are in Louisiana as part of a six-year, $170 million National Institutes of Health program to study the molecular nitty-gritty of exercise.

Decades of research have shown that exercise is good for people, but scientists don't know what's going on at the body's most basic level.

"Basically, we're looking to learn which molecules change in our bodies after exercise and which molecules transmit the benefits to the organs and tissues that aren't directly involved in physical activity," said Dr. Tuomo Rankinen, an associate professor at Louisiana State University's Pennington Biomedical Research Center, and co-leader of Pennington's share of the study.

Pennington is among 12 universities and institutions working together to study 2,400 sedentary adults and 300 who work out at least four hours a week. They'll be looking for people from a variety of racial and ethnic groups. Forty percent of the sedentary people will be chosen at random for four hours a week of supervised endurance training, 40 percent for supervised resistance training and the rest will be assigned to remain couch potatoes.

All 2,700 will undergo a battery of tests and give muscle, fat and blood samples at the start and after three months.

They'll have tests of cardiopulmonary function, muscular strength, and body composition. They'll be given wearable devices to monitor their physical activity levels when they're not in the lab. They'll be interviewed and fill out questionnaires at the start and end.

The scientists will supervise the work and study those samples and tests.

From Tuesday through Thursday, they're training at Pennington to ensure that they all use the same procedures to train participants, to do medical tests, and to handle the samples, said Dr. Eric Ravussin, Pennington's associate executive director for clinical science and the center's other principal investigator for the study. Pennington is getting

about $6.8 million, he said.

Other scientists are from Ball State University in Muncie, Indiana; Duke University in Durham, North Carolina; East Carolina University in Greenville, North Carolina; Florida Hospital in Orlando, Florida; University of Alabama at Birmingham; the University of California at Irvine; the University of Pittsburgh; the University of Colorado in Denver; Wake Forest Baptist Medical Center in Winston-Salem, North Carolina; University of Texas Medical Branch at Galveston; and University of Texas Health Science Center at San Antonio.

That's just part of the program. The consortium created by NIH in 2016 also includes clinical trials for people younger than 18, seven chemical analysis sites, three animal studies, a bioinformatics center and a coordination center. The program also is providing money to store data in a user-friendly public bank available to all researchers.