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New obesity study checks genetic link

SANTA CLARA FIRM'S CHIPS TO BE USED IN WORK ON ISLAND

By Paul Jacobs

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Researchers on a hunt for the causes of obesity are looking for clues in the genetic makeup of 3,000 inhabitants of the Micronesian island of Kosrae in the western Pacific.

Gene hunters from Rockefeller University announced Monday that they will use gene chips developed by Affymetrix in Santa Clara to look through hundreds of thousands of variations in the genetic code of the Kosrae population to discover why most of them are seriously overweight -- and why others on the island are not.

And what they find could help in the effort to fight a worldwide epidemic of obesity.

Obesity was once almost unheard of on the island. All that changed following World War II, when the traditional Polynesian diet of fish, fruit and vegetables was abandoned in favor of fatty Western foods.

"Everyone was once thin," said Greg Yap, a senior marketing director at Affymetrix, which developed the latest tools being used to study the Kosrae people. "Within a generation there was an explosion of obesity within this population and all the diseases that go with obesity."

The Rockefeller team has been studying this population for a decade, trying to understand why a once healthy and lean population now suffers from obesity, diabetes, high blood pressure and high cholesterol -- a collection of disorders they've dubbed syndrome X.

Obesity is not just a concern of Pacific Islanders. As many as 64 percent of adults in America are seriously overweight or at risk of becoming obese, according to one study. And it has become an increasing problem among children, not just in the United States, but throughout the developed world.

In many ways the island, 2,500 miles southwest of Hawaii, is a perfect laboratory for genetic studies. Most of the people there are descendants of about 50 Polynesians who settled the island about 2,000 years ago. But in the 19th century, European whalers also settled on the island. Today the islanders are a genetic mix of the two distinct peoples.

Using frozen blood samples from volunteers, the scientists have been searching through DNA -- the genetic instructions within every cell -- looking for the genes that can help explain the islanders' health problems and why some on the same diet remain healthy.

The Affymetrix chips are small squares of glass dotted with tens of thousands of probes that can detect the presence of tiny chemical variations in DNA called SNPs (for single nucleotide polymorphisms). The chips allow the scientists to quickly test for 200,000 or more individuals

in a sample from a single individual.

Think of the SNPs as miniature mileposts along long stretches of DNA. Some of those mileposts may signal the presence of mutations responsible for syndrome X and the epidemic of obesity on the island.

“One of the things that is particularly attractive about the Kosrae population is the tremendous amount of information that's been collected,” Yap said. The volunteers have been given regular medical exams over the years, so genetic differences can be linked to their health histories.

And the scientists, Yap said, have been working closely with the island government and will share any financial returns that come from their findings.

Identifying the genes, Yap said, “will have a significant impact on our ability to develop treatments that will eventually cure these major diseases.”