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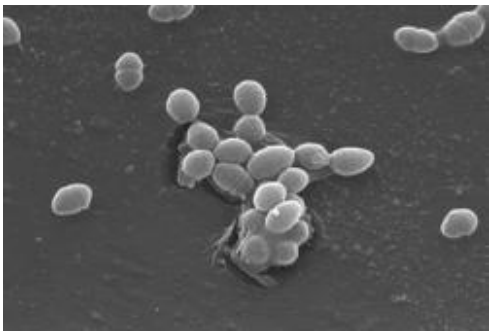
Human gene catalog shows it's mostly a mystery

Thu, May 20 2010



By Maggie Fox, Health and Science Editor

WASHINGTON (Reuters) - They live in us and on us, helping digest food and keeping acne at bay, and researchers said on Thursday that most of these germs are turning out to be new to science.

The first look at 178 different microbes that live in or on the human body shows that more than 90 percent of their genetic sequences were unknown and raise questions about how scientists classify species among micro-organisms.

"Most people don't even realize how much microbial diversity we have on and in us," said Karen Nelson of the J. Craig Venter Institute in Rockville, Maryland, who leads the ongoing study.

"We are dependent on them for digestion of plant material and some vitamins," she added in a telephone interview.

Yet scientists know very little about the many hundreds of different types of bacteria, viruses and yeast that inhabit the skin, mouth, scalp and most of all, the gut.

"The oceans and the soils have gotten more attention than the human body," Nelson said.

Researchers at the Baylor College of Medicine in Houston; the Broad Institute in Cambridge, Massachusetts; Washington University in St. Louis and the Venter Institute are working on the $157 million, five-year Human Microbiome Project to survey all the microbes important to human health.

FIGHTING DISEASE

There are hints that healthy colonies of microbes not only process vitamins, but maintain pH balance on the skin, prevent tooth decay, protect against diarrheal infections and defend against sexually transmitted infections.

The researchers recruited 300 healthy volunteers who are allowing themselves to be swabbed and examined. "At least 15 additional projects will focus on disease conditions," Nelson said.

Reporting on Thursday in the journal Science, Nelson and colleagues described 500,000 new genetic sequences, all from bacteria so far. "There is a lot of diversity. We don't really know what this means," she said.

They found more than 29,000 new proteins, which are the compounds made by cells based on their genetic sequences. This suggests these microbes are up to a great deal of previously undocumented activity.

"This initial work lays the foundation for this ambitious project and is critical for understanding the role that the microbiome plays in human health and disease," said National Institutes of Health director Dr. Francis Collins.

"We are only at the very beginning of a fascinating voyage that will transform how we diagnose, treat and ultimately, prevent many health conditions."

One they examined, a bacteria called Lactobacillus reuteri, seems to have a distinct genetic sequence for each species whose gut it inhabits -- rats, pigs and people. Nelson said there are also indications that individual people host their own unique species of germs.

L. reuteri, found in breast milk, may protect against rotavirus infections, other researchers have found,

In 2006 Steven Gill of the State University of New York in Buffalo estimated that 90 percent of the cells on the human body are actually bacteria.