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A sampling of presentations that made news at the meeting of the American Association for the Advancement of Science that began in the District yesterday.

In a step toward one day offering gene-based customized medicine, scientists released the first map of common human genetic variations -- patterns of DNA differences that may help forecast people's disease risks and best treatments.

The map, created by California-based Perlegen Sciences Inc., is essentially the first chapter in the quest to identify tiny bits of genetic information, known as SNPs or "snips," that are considered key in creating gene-based medicine. A more detailed version is expected later this year.

Public health experts view it "with a lot of excitement," said Lawrence Lesko, who heads the Food and Drug Administration's division of gene-based medicine.

Until now, most genetics breakthroughs have come by identifying a single-gene mutation that causes illness. But the most common health problems, such as heart disease, diabetes or depression, are caused by complex interactions among numerous genes and environmental or behavioral risks. Teasing out the genetic component has been almost impossible.

For example, Lesko said, only a fraction of smokers develop lung cancer, and only about 10 percent of those patients respond to lung-cancer therapy -- but no one knows why or can predict who will be unlucky. The SNP map, Lesko said, gives scientists a way to study such questions and design better drug treatment.

Perlegen scientists examined the DNA of 71 Americans of European, African or Chinese ancestry and identified 1.58 million SNPs -- most of them shared across the three populations.

They are a fraction of the estimated 10 million SNPs thought to exist. But they appear to be the most common ones, said lead researcher David R. Cox. The map does not say which SNPs cause various physical or disease-related traits, but Perlegen, of Mountain View, Calif., is making the map available for free to other scientists to study that.

-- Associated Press

Scientists have developed a robot that learns to walk like a toddler, improving its step and balance with every stride.

The walking robot looks more like a moving Erector set than a human, but the machine has the unmistakable gait of a person strolling along: using its curved feet and motorized ankles to spring its legs forward and swinging its arms at every step to help with balance.

Researchers showed off the learning, walking robot along with two less-advanced models at the meeting, and a report on the research appears this week in the journal Science.