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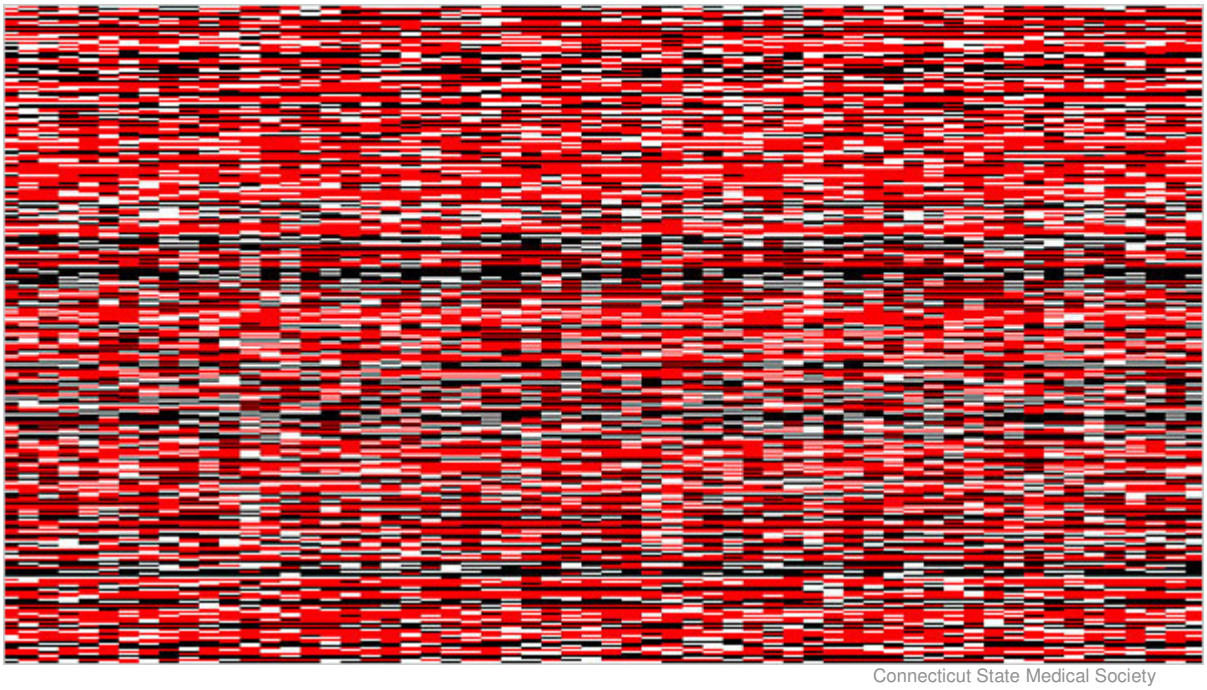
ON THE WEB

In the Art of a DNA Graph, the Colors of Uniqueness



Connecticut State Medical Society

EYE CATCHER Graph of DNA sequences with nearly 24,000 genetic markers.

By BINA VENKATARAMAN
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What is black and white and red all over? Here's a hint: It is not the newspaper, at least not in this instance.

When Dr. Gualberto Ruaño, director of genetics research at Hartford Hospital in Connecticut, was creating a digital "collage" to promote personalized medicine, he and his team tried blue, green, yellow and even a dull gray scale before settling on this eye-popping — maybe even a bit eye-straining — scheme of red, white and black.

"Being biologists and doctors, red is our blood, red is our fluid," Dr. Ruaño said, adding that he sought the "staccato effect of contrast."

“DNA Collage 1” is on the cover of the new issue of Connecticut Medicine. Dr. Ruaño called it a “snapshot” of variations in the genome sequences of 62 people, one to a column, from blood samples taken in clinical studies at the hospital.

Tiny rectangles, making up what appears more a grid than a collage, are each a “fingerprint” showing how a person’s DNA sequence varies and what makes the person unique — or not. Differences in the sequences could affect, for example, how likely a person is to have heart problems or suffer side effects from a cholesterol drug.

All people have in common more than 99 percent of our gene sequences. Yet the type of sequence variation portrayed here, caused by a single altered nucleotide, accounts for most of the genetic differences among humans.

The colors show the DNA type inherited from a father, mother or both parents. Red signals a “genetic mosaic” of the parents, with different sequence variants from each. Black and white rectangles show that a person inherited the same sequence variant from both parents.

“We wanted to synthesize variability into a clear pattern,” said Dr. Ruaño, who is president of Genomas Inc., which is developing genomics-based tools for diagnosis and drug prescription. “The eye is the most important pattern recognition instrument that humans have.”