



A mannequin covered in letters denoting DNA bases draws visitors to an interactive exhibit in *Genome*.

## GENOMICS

# The big blueprint

**Gene Russo** surveys a high-tech exhibition celebrating the double helix and the human genome sequence.

**T**wo landmark dates in biology sparked *Genome: Unlocking Life's Code* — the completion of the human genome 10 years ago, and the unveiling of the double helix by James Watson and Francis Crick 60 years ago. The exhibition, currently at the Smithsonian National Museum of Natural History in Washington DC, has a tough task: to render the abstractions and complexities of genomics a feast for the senses. That microscopic, interiorized world presents a curatorial challenge light years away from displaying *Tyrannosaurus rex* skeletons.

Yet *Genome* — a Smithsonian Institution collaboration with the US National Human Genome Research Institute in Bethesda, Maryland — does engage, even if the content is sometimes a bit dense. Videos, genomics trivia and interactive screens navigated by track pad help to explore everything from bioethical quandaries to genomic testing. One section marks the two big anniversaries with films featuring, among others, Watson recalling the 1953 discovery and National Institutes

**Genome:  
Unlocking Life's  
Code**

Smithsonian National  
Museum of Natural  
History, Washington DC.  
Until 1 September  
2014, then on tour.

of Health director Francis Collins touting the importance of making genomic data freely available. As lead curator Meg Rivers puts it, the idea is to reveal to visitors that genomics is 'all about them.' "The biggest challenge is saying what a genome is, and making it meaningful," she says.

There are three thematic areas, covering genomics' influence on health and medicine, genes and ancestry, and genomic connections among living things. Any one of these could make an entire exhibition on its own.

An animation on a large LCD screen nicely explains the inner workings of DNA, genes and proteins. Factoids flash on-screen. "Unfolded, DNA is six feet long," we're told. "Yet it's 30,000 times thinner than a strand of human hair." A section on next-generation genomic medicine focuses on combating disease, personalized drug treatments and DNA sequencing's role in halting the spread of deadly infections. "How much do you want to know about your family's genetic

make up?" asks one interactive panel.

To learn about ancestry, you can drag an arrow across a timeline on a touch-screen world map to see how humankind migrated and how genetic diversity has changed over tens of thousands of years. Humans started out in Africa, but migrants took along only a portion of the genetic diversity — today, Africans harbour a more diverse gene pool than other populations.

Another section asks what we can glean from the genomes of other life forms. Selecting the horseshoe crab on a screen reveals that the species has not changed for 200 million years. 'Is it a living fossil?' it asks. No, we discover: only a small part of the genome controls body shape; the rest of the genome has continued to evolve.

Questions posted on the wall at the entrance ask visitors to describe their physical features and then reveal what proportion of people share their particular combination. 'Do you have dimples?' No. 'Are the lobes of your ears attached?' Yes. 'Can you curl your tongue?' No. 'Is your hairline pointed in the center?' No. Conclusion: '4% of 292 people polled share these four physical traits with you.' Another part of the exhibit probes thorny ethical dilemmas. For example, should we place limits on genomic research? A touch-screen prompt then asks the user to consider factors such as facilitating faster cures and getting permission from subjects.

To keep the show feeling fresh, a news ticker scrolls the most recent genetics-related stories onto a wall. On the day of the press preview, for example, the Supreme Court had just come down with its ruling against Myriad Genetics on patenting genes.

My main quibble is that *Genome* offers little to younger children, in a museum receiving 7 million visitors annually. The omission is even odder given that another exhibition has already shown the way. In 2001, the American Museum of Natural History in New York staged *The Genomic Revolution*. It featured a stack of 180 Manhattan telephone books, 1,646 pages each, in the shape of a double helix; the number of characters in them roughly equals the number of base pairs in DNA. Smaller children also loved the 'mutation station', where you could 'change a gene' by turning a rung on a giant plastic double helix. A television screen showed the physical effects in a fruit fly.

In this age of iPads and touch-screen technology, one might have expected a more creative approach than *Genome*'s final draft — perhaps a big touch screen allowing users to drag and match 'As' with 'Ts' and 'Cs' with 'Gs' on an animated double helix. Such a presentation might have prompted young and old alike to think about this thing in all of us called a 'genome'. ■

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