Tunicate genome found out of order
Scrambled genes suggest that arrangement may not matter

By Tina Hesman Sayers

As any devotee of Antiques Roadshow can tell you, just because something has been saved doesn't mean it's valuable.

Likewise, a new study of plankton shows that hanging on to a well-preserved genome isn't necessarily crucial. The genome of the tunicate Oikopleura dioica contains roughly 18,000 genes, nearly as many as the human genome's 22,000 or so, but with the genes in a completely different order and less DNA stuffed between them, an international team reported online November 18 in Science.

The finding came as a surprise to researchers since it has been thought that the arrangement of genes on chromosomes helps determine how an organism's body plan will be laid out. Humans and other vertebrates tend to have genes arranged in a similar order. Many researchers thought that this genomic structure was important since it was preserved over millions of years of evolution. But the tunicate genome's scrambled gene order could indicate that other organisms' genomes got and stayed that way without any pressure from natural selection.

"Intuitively, you wouldn't believe that just by chance things would be conserved for 500 million years," says coauthor Daniel Chourouk of the University of Bergen in Norway. This result suggests that the genome structure in most animals may have been maintained simply by inertia.

The tunicate genome also contains clues to the source of introns, chunks of DNA that are sandwiched between protein-coding parts of genes. Examination of tunicate introns indicates that many are copies inserted into the genome in new places. The new report gives the first direct evidence of this, says evolutionary biologist Michael Lynch of Indiana University in Bloomington. "Any insight into that is welcome," he says.

Tunicates, some of the ocean's most abundant zooplankton, are helping solve genetic mysteries.