African lineage has the most diversity, Horai concluded that last common ancestor lived in Africa. Says Pennsylvania State University molecular anthropologist Mark Stoneking: "I think this is great—it's the maximum amount of information you can wring out of the mitochondrial genome."

But even Horai's work doesn't provide a complete picture. MtDNA is only one of 40,000 gene lineages in humans. Moreover, it is maternally inherited and can't reflect the genetics of fathers, and thus is an incomplete record of human population movements. A male hunting party, for instance, could become separated from a larger group, or a group of females and children could be carried off by invaders. Critics such as paleoanthropologist Milford Wolpoff of the University of Michigan, Ann Arbor, who has long advocated multiregional origins of modern humans, says it is possible that the ancestry for one part of the genome may not be the same as that of the entire species. Stanford University geneticist Luca Cavalli-Sforza agrees: "We've learned if we study a single gene we cannot get a reasonable conclusion for the human species. To get reproducible results, we have to study many genes."

Cavalli-Sforza and his colleagues told scientists in Atlanta they had done just that using nuclear DNA from 30 Africans and 120 people from four other continents. They looked at chromosomes 13 and 15, and they zeroed in on 30 different microsatellites, tiny stretches of nuclear DNA that are made up of a repeating series of nucleotides. As in the mtDNA, Cavalli-Sforza found more diversity within the African microsatellites, and he used that diversity to calculate how much time has passed since Africans separated from other populations. His conclusion was that Africans split from non-Africans 112,000 years ago.

These nuclear markers give scientists a good window into the past movements of populations of people, says Stoneking, because they come from different parts of the nuclear genome. "As more and more genetic lineages are looked at this way, the data get stronger and stronger against regional continuity," says Stoneking. Although critics like Wolpoff are still unconvinced, the evidence coming out of our genes, like the putative African founder population itself, seems to be sweeping the field.

Trouble for Planet Formation

For astronomers hoping to find planets outside our solar system, the traditional picture of how a new star forms has provided plenty of grounds for optimism. As a cloud of interstellar gas condenses into a protostar, theorists have assumed, a disk of gas and dust routinely forms around it—the raw material for planets. But in Atlanta, astronomer Andrea Ghez of the University of California, Los Angeles, presented a decidedly gloomier picture: Virtually all young stars are formed in multisystem stars, she said, and these companion stars are in the habit of hoovering up most of the gas and dust that could form planets. If the disks are vital to planet formation, other planetary systems could be very rare indeed.

In a conference session mostly devoted to planet searching, you might expect some hostility toward such news. But as so little is known about other planetary systems and how they form, planet searches weren't deeply discouraged. "It's very interesting, but it's not going to stop anyone looking for planets," says Robert Brown of the Space Telescope Science Institute (STScI) in Baltimore.

Ghez based her argument on a study of T Tauri stars, the "young counterparts of solar-type stars," she says, and the closest thing to the protostars posited by planetary theorists. Ghez examined a complex of three such stars that formed at the same time. If protostars routinely develop disks of gas and dust, all three stars should have disks that radiate similar amounts of infrared light. But Ghez found that two of the stars, lying especially close to each other, give off much less radiation than the third. This, Ghez suggests, means there is much less gas and dust around the close pair. "The close companion has a disruptive influence and depletes the dust," she says, adding that "such stars are unlikely to be able to form planetary systems."

And unfortunately for planet searchers, such stars seem to be all over the place. Several years earlier, Ghez had taken a close look at nearby T Tauri stars using the 5-meter Hale telescope at the Palomar Observatory in California and another telescope in Chile. She sharpened the resolution of the telescope using speckle imaging, a technique in which computer processing counters our atmospheric blurring. Focusing on the two nearest star-forming regions—Tarus-Auriga and Ophiuchus-Scorpius—she counted how many of the T Tauri stars have actually multiple stars orbiting each other.

By now, Ghez has surveyed 110 T Tauri stars and found that around 60% of them are in multistar systems. And it's possible the news is even worse. Ghez's technique is only sensitive to binaries or multiples in which the stars lie from 15 to 250 astronomical units apart. (One astronomical unit equals the distance between Earth and the sun.) Some of the T Tauri that her survey marked as solo stars may in fact have companions, only at smaller or wider separations than she could detect.

That could mean that few stars are born with the wherewithal to make planets, but astronomers—an optimistic group—are not dismayed. "It doesn't need much mass to make a Jupiter. It's only one-thousandth the mass of the sun," says Todd Henry of STScI. After all, says Don McCarthy of the Steward Observatory at the University of Arizona, planets did incontrovertibly form around one star system—ours—and there are a few other T Tauri solos in the neighborhood, so star-making ability may not be as rare as Ghez claims. But "until we find a another solar system like our own, speculation will be wild," he says.
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