how it gets into the nucleus from the cytoplasm, where it is made. Nevertheless, "the data are absolutely compelling," Ouspenski says. "There can be no doubt that [the finding] is real." **–ELIZABETH PENNISI**

Homing In on a Sperm Receptor

From the U.S. president on down, it seems everyone is in a jam over sex. Sex causes problems for scientists, too, especially when it comes to understanding a key event: the union of mammalian eggs and sperm. But at the meeting, Nicole Sampson, a chemist at the State University of New York, Stony Brook, reported new findings that may help.

Although researchers have identified several sperm proteins that appear to bind to mammalian eggs, they have had less success at pinning down the receptors on the egg that grab onto those sperm molecules, mainly because eggs are scarce. Indirect evidence did suggest that an integrin, a type of protein known to be involved in cell-cell interactions, might be an egg receptor for sperm, but no one had detected physical contact between the integrin and any sperm proteins—until now, that is. Sampson and her colleagues have shown that the integrin binds to a small piece of sperm protein called fertilin already known to be critical for fertilization. (The results also appear in the January issue of *Chemistry and Biology*.) "This is the first evidence of direct binding [to fertilin]," says Paul Primakoff, a cell biologist at the University of California, Davis. The result might eventually lead to novel contraceptives that work by blocking fertilin binding to the integrin and perhaps also to a better understanding of human infertility.

Researchers had suspected that fertilin might attach to an integrin, because the sperm protein's amino acid sequence identified it as a member of a group of known integrin-binding proteins called disintegrins. Several teams had also found that peptides that correspond to fertilin's integrin-binding region bind to the egg membrane and inhibit sperm-egg fusion—presumably by blocking the sperm protein's attachment site. Antibody and other indirect evidence suggested that an integrin called α-6/β-1 might form that site, but Sampson and her colleagues decided to look directly for the receptor, using the putative integrin-binding domain of fertilin as bait. By narrowing their search to integrins, they exploited the limited number of available eggs to good advantage—and got very lucky.

To find possible fertilin-binding partners on the egg, the researchers synthesized a radiolabeled peptide containing 13 amino acids from the putative integrin-binding region of fertilin plus an amino acid that would attach to any nearby proteins in response to a flash of light. When they then incubated this peptide with mouse eggs and zapped the mixture with light, the researchers found that the peptide had attached to just one protein, which proved to be α-6/β-1 integrin. "The most remarkable thing to us was the specificity of labeling," says Sampson.

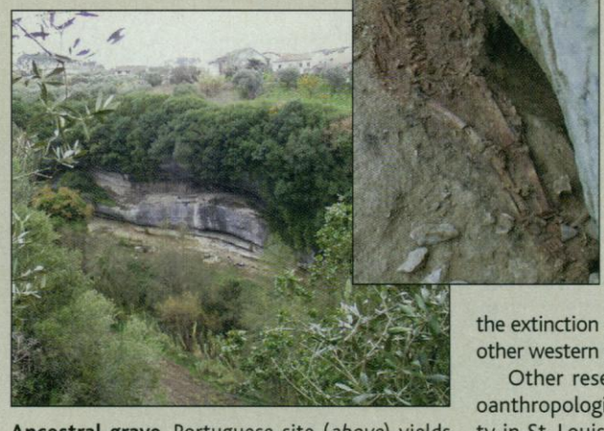
Even if further research proves that the egg integrin is a sperm receptor, the finding will not entirely explain the sperm-egg binding process. "While this interaction is important, there are likely to be other sperm and egg molecules that complement it," says Janice Evans, a reproductive cell biologist at the Johns Hopkins University School of Public Health in Baltimore. Still, the peptide the Sampson group used to fish out the α-6/β-1 integrin does inhibit in vitro fertilization, suggesting that the egg integrin could provide a new target for birth control. That could prove tricky, however, because the integrin is also on other cell types, posing challenges in drug delivery and raising the possibility of side effects.

Nevertheless, the finding is a sign that researchers are making headway in solving the puzzles of mammalian sex—at the molecular level, at least. "We didn't know the molecules on sperm and egg that were involved in [membrane] interactions just a few years ago," says Richard Schultz, a developmental biologist at the University of Pennsylvania, Philadelphia. "There's been a quantum leap in our understanding since then." **–E.S.**

Ancient Child Burial Uncovered in Portugal

In a rock-shelter in rural Portugal, archaeologists last month made a rare find: the complete skeleton of a young child of our own lineage, whose body was covered in red ochre and buried with ceremony perhaps 28,000 years ago. Researchers say the child may prove to be the oldest well-preserved early modern human on the Iberian peninsula. And in addition to the bones themselves, the burial may provide cultural clues to a pivotal era, when the last of the Neandertals co-existed with modern humans in southern Iberia.

Although the skull was shattered, the lower jawbone, complete with teeth, is almost intact, and the protruding chin clearly marks the child as an anatomically modern human, says Joao Zilhao of the University of Lisbon, Portugal's director of antiquities and leader of the excavation team. The find was made in early December when two of Zilhao's assistants were inspecting rock art in a valley about 140 kilometers north of Lisbon and spotted sediments containing charcoal and stone tools. Further probing yielded human arm bones and eventually a complete skeleton.



Ancestral grave. Portuguese site (*above*) yields Iberia's earliest known human (*above right*).

The body had apparently been wrapped in a blanket or animal skin drenched in red ochre, a practice thought to be related to ochre's resemblance to dried blood. A pierced marine shell, probably a pendant, lay near the throat, and animal bones were near the head and feet. Such features are typical of early modern human burials in central and eastern Europe, says Zilhao; the child's skeleton shows that early humans maintained common cultural practices over a vast area.

The bones were 2.5 meters below stone tools dated to about 21,000 years ago, suggesting that the bones could be as old as 28,000 years. If so, "it is really one of the first modern humans [in the region]—the ones that caused the extinction of the Neandertals," says Zilhao. Only two other western European burials are so old.

Other researchers are excited by the news. Paleoanthropologist Erik Trinkaus of Washington University in St. Louis rushed to Portugal this week to examine the bones. If the ages hold up, the find will be highly significant, says anthropologist Chris Stringer of the Natural History Museum in London. "We have very little material [from] this critical period" in Iberia, he says.

–CONSTANCE HOLDEN

CREDITS: J. ZILHAO