

can override regulation by Clb-Cdc28 simultaneously. The researchers did this by eliminating the potential phosphorylation sites in ORC and adding a sequence to one of the genes encoding a protein in the Mcm complex that prevents the complex from leaving the nucleus. They also put the gene for a degradation-resistant version of Cdc6 under control of an inducible promoter. That let them express Cdc6 even when Clb-Cdc28 activity is high and Cdc6 is normally degraded. The altered yeast cells could no longer block DNA rereplication. But the yeast cells didn't copy the DNA over and over again: For reasons that are currently unclear, they produced only about one genome's worth of extra DNA.

An important implication of the result is that control of the replication trigger is separate from that of the block for pre-RC reassembly, an outcome Li deems fortunate. When he began the work, he recalls, he was concerned that, like Clb-Cdc28 itself, the targets would be needed to initiate replication, as well as to inhibit formation of the pre-RCs. If that had been the case, he says, the cells wouldn't have replicated at all and "we would have been stuck." The fact that that wasn't the case, Li adds, indicates that there are other phosphorylation sites on those proteins or additional proteins that trigger initiation of replication.

The results "show that there are multiple levels of control of prevention of the rereplication," says molecular biologist Stephen Bell of the Massachusetts Institute of Technology, a finding that, he notes, emphasizes just how important that function is. Bell is also intrigued that inhibiting pre-RC assembly and triggering initiation are regulated separately. "The simplest model would have been that they were coupled, but once again the cell defies expectations."

—R. JOHN DAVENPORT

## ARCHAEOLOGY

### Unwrapping a Modern Mummy Mystery

**BERN**—Last October, police in Pakistan's remote province of Balochistan seized an ornately carved mummy coffin on offer to art dealers for \$11 million. A golden plaque on the coffin included an Old Persian cuneiform inscription suggesting that wrapped inside were the 2600-year-old remains of a daughter of King Xerxes. But like a pulp-fiction mummy unraveling in front of horrified onlookers, the exalted Persian princess's pedigree has fallen to pieces. Indeed, the intriguing circumstances read like the plot of a dime novel. The female mummy now appears to have been a relatively recent murder victim or else a body snatched from a grave shortly after

death—two grisly scenarios that have scientists digging for clues to her true identity.

Recent analyses have shown that the artifact is a fake, but that the corpse is very real. Last week, a German team announced that it is conducting radiocarbon dating of muscle, skin, and bone snippets from the mummy to find out how long the toothless and tongueless bandage-wrapped body has been dead, which might help determine whether her broken back indicates foul play. "The mummy is clearly a fake, and this may have been a murder," says curator Asma Ibrahim of the National Museum of Pakistan in Karachi.

Although the discovery initially caused a sensation last fall, it wasn't long before archaeologists and others began to voice suspi-



**A royal hoax.** Scientists have debunked claims that this mummy was a Persian princess.

cions. Scientists were dubious about the cuneiform inscription, which bore a few textual mistakes. They also looked askance at the preparation of the mummy, which was not fully desiccated. "The mummy's bandages were so hard and thick, we had to use an electric drill to cut through them," says Ibrahim, who says that genuine mummies are more easily unwrapped. Further inspections and computed tomography scans of the body, now in a Karachi mortuary, showed that the woman's back was broken and that her mouth and stomach were "full of a powder," samples of which are now being analyzed, Ibrahim says.

In a further plot twist, the Iranian Cultural Heritage Organization said last fall that it planned to take legal action to seize the mummy. The grounds: a suspicion that the mummy may have been an ancient member of the Persian royal family smuggled into Pakistan from Iran. In January, however, a delegation of Iranian experts—citing errors in the breastplate inscription and other flaws—declared it a fake. A month later, *Archaeology* magazine weighed in, reporting that a U.S. expert on Old Persian texts had concluded that the cuneiform on the mummy casket was likely a modern falsification lifted in part from a 520 B.C. inscription of King Darius at

the Behistun site in western Iran.

In the meantime, Ibrahim had sent samples from the coffin, the matting under the mummy, and the bandages and resins to Pakistani experts and to the German Archaeological Institute in Berlin for analyses. The Pakistan Atomic Energy Commission's laboratory agreed to stray outside its bailiwick to radiocarbon date some of the materials. "We wanted to get Pakistani scientists involved," says Ibrahim, who in April issued a report finding that the materials were of recent origin and concluding that the mummy is a fake.

Ibrahim says that recent tomography scans and other analyses indicate that the body—whose bones show signs of osteo-

porosis—is that of a woman older than 50 who died probably within the past 5 or 6 years. However, to chase Ibrahim's hunch that the mummy is a murder victim or was dug up by grave robbers shortly after it was interred, Pakistani detectives would need a better idea of the time and place of death.

The detective assignment is being taken on by physicist Gerhard Morgenroth, who says his lab at the Friedrich Alexander University of Erlangen-Nuremberg, Germany, is working "to give as exact a time frame as possible" for the woman's death. Earlier this year, the

German Archaeological Institute in Berlin sent Morgenroth samples of cloth and matting from the coffin. He has dated them using accelerator mass spectroscopy, which detects minuscule concentrations of elements. This spring, Morgenroth's tests determined that the fabric "could not be more than about 40 years old," as it contains traces of radioactive isotopes from nuclear-weapons tests carried out between either 1958 and 1960 or 1992 and 1994. The BBC, which is preparing a documentary, has commissioned Morgenroth to carry out such tests on the mummy's tissue samples. These tests, now nearing completion, should be able "to date the mummy's time of death to within 2 or 3 years," he says. But they can't place where the woman died. Meanwhile, Ibrahim fears that a ring of mummy-fakers may try to produce and sell similarly false artifacts.

If there's a lesson to be learned, Ibrahim says, it's that it pays to scratch below the surface of any archaeological claim. "The wooden coffin was beautiful and very convincing, so the flaws were not obvious at first," she says. Now Ibrahim would like to see the mystery solved—and those who perpetrated the hoax brought to justice.

—ROBERT KOENIG