



favors federal funding of human embryonic stem cell research, including nuclear DNA transfer. He wants to create a universal, federally backed health system. And his spokesperson, Audrey Waters, says he supports budget increases “substantially better than the pace of inflation” for the

JOHN EDWARDS MADE A FORTUNE AS A PERSONAL-INJURY lawyer in the 1980s and was John Kerry’s vice president on the unsuccessful Democratic presidential ticket in 2004. But this year, he is campaigning as a populist and a Washington outsider.

The son of mill workers, Edwards pounds away at the “big, powerful interests,” the “corrupt,” and the “very greedy” in his standard stump speech. The 54-year-old former North Carolina senator (1998–2004) wants to make sweeping changes, some of which would affect research. He would end what he calls the “antiscience” practices of George W. Bush’s Administration—such as “censoring research and slanting policy on climate change, on air pollution, on stem cell research.” And he would increase science funding. Despite such promises, however, biomedical researchers who remember the malpractice lawsuits that Edwards championed 2 decades ago—some of which were based on questionable science—are wary.

If Edwards actually does move into the White House, he says his own presidential science adviser would have more clout than the current one and would play “a central role as an assistant to the president.” To protect scientific integrity, Edwards would “eliminate political litmus tests for government scientists” and forbid political appointees “from overriding agencies’ scientific findings unless the chief White House science adviser concludes they are erroneous.”

Edwards’s agenda for improving the U.S. economy includes a mixture of very specific projects and broad promises. For example, he advocates a low-cost “universal Internet” for rural communities and more research on autism and fragile X syndrome, a genetic cause of mental impairment. He

REPUBLICAN RUDOLPH GIULIANI

Home State: **New York** Web site: joinrudy2008.com

Most Recent Job: **Founder and Executive, Giuliani Partners** Age: **63**

SPEAKING “IN THE MOST HUMBLE WAY POSSIBLE,” RUDY Giuliani disclosed on the campaign stump in Iowa last summer that “I’m very good at doing the impossible. I am.” Indeed, he’s

made a career of slaying dragons, including winning the convictions of prominent Wall Street and organized crime figures as a federal prosecutor in the 1980s and overseeing a huge drop in New York City’s crime rate as its mayor from 1993 to 2001.

So what does this 63-year-old dragon slayer make of science? That’s hard to determine because his campaign successfully discouraged key advisers from speaking to *Science* about specific issues. But his public career suggests that Giuliani is a pragmatist with a quick grasp of issues, a lover of statistics, and a firm believer that most tasks can be done better by private institutions than by government.

On social issues, Giuliani stands



out among the Republicans for what he has said about abortion: With reservations, he would let the woman decide what to do. On a linked topic, research on human embryonic stem cells, he said in May that “as long as we’re not creating life in order to destroy it—as long as we’re not having human cloning ... I would support [federal funding].” David Carmel, a biotech executive and member of the board of the New York Stem Cell Foundation, made the case for embryonic stem cell research in a private debate last fall that the candidate staged to explore both sides of the issue. Based on Giuliani’s questions, Carmel says he believes Giuliani, if elected, would reduce federal restrictions.

National Institutes of Health (NIH) and the National Science Foundation.

On environmental policy, Edwards has won the “enthusiastic endorsement” of Friends of the Earth Action, the nonprofit group’s political arm. That support is based in part on his proposal to cut greenhouse gas emissions by 80% by 2050, using a cap-and-trade system to auction off permits as a regulatory incentive. Edwards says he would take at least \$10 billion a year from that auction and another \$3 billion from other sources to invest in a trust fund for new technologies. It would develop solar, wind, and “cellulose-based biofuel” projects.

The environmentalists are also pleased with what Edwards would not do. He opposes any expansion of nuclear power, the candidate explained in a recent debate, because it is “extremely costly ... and we don’t have a safe way to dispose of the nuclear waste.” Liquefied coal is out, too, he says, because “the last thing we need is another carbon-based fuel.”

Yet among scientists, Edwards “carries some baggage,” says Peter Agre, a Nobel Prize-winning biochemist now at Johns Hopkins University in Baltimore, Maryland. Although Edwards is a “good man,” says Agre, “I know people who would never vote for him” because of the way he and other lawyers pursued and won multi-million-dollar medical malpractice awards representing children born with cerebral palsy.

In a 1985 case, for example, Edwards

Giuliani’s record as mayor and author add few clues about his outlook on science. Rodney Nichols, former president of the New York Academy of Sciences (NYAS), gives him high marks for his interest in two city-backed projects involving science and somewhat lower marks for follow-through. Nichols recalls how the mayor agreed to host an NYAS award to honor scientific excellence, even though it “would not win [him] votes.” At the same time, Nichols says that “not much came” of a panel on how to bring biotech companies into the city, as the mayor lost interest once local medical institutions began to jockey for concessions.

In his 2002 book *Leadership*, Giuliani wrote, “I loved learning biology” as a premedical student at Manhattan College. But in the end, he says that he chose law school and politics because “I liked ideas better than science.” New York City invested heavily in crime statistics—a system called CompStat—to help command a burgeoning police force. The model has been copied in many cities, and Giuliani has proposed clones for other tasks, which he calls JobStat, SchoolStat, EnergyStat, and HealthStat.

The technical issue that proved most controversial for Giuliani this fall, in fact, involved his use of health data. An ad in New Hampshire claimed that people diagnosed with prostate cancer (as he was in 2000) in the United Kingdom are more likely to die of their disease because of its system of “socialized medicine” than their U.S. counterparts. The ad cited survival rates of 82% for the United States and 44% for Britain. This provoked a flurry of criticism. A spokesperson for Giuliani revealed that the candidate found the data in the journal of the Manhattan Institute for Policy Research, a conservative think tank to which he has close ties.

Experts say it’s easy to misread the numbers. Recent data from the U.S. National Cancer Institute and an international survey called Eurocare

addressed the jury in the voice of a brain-damaged child, describing from within the womb how she waited for a doctor to perform a cesarean section as a fetal heart monitor signaled her distress. The doctor was accused of waiting too long; the jury awarded \$6.5 million. Many such suits were “fueled by bad science,” says neurologist Karin Nelson of NIH, who concedes she has not reviewed the specific cases that Edwards handled. She says that the same type of

cerebral palsy litigation has now spread to Europe—to the detriment of children’s health, she believes. Nelson sat on a panel of the American College of Obstetricians and Gynecologists that in 2003 found that most cases of cerebral palsy are not caused at birth.

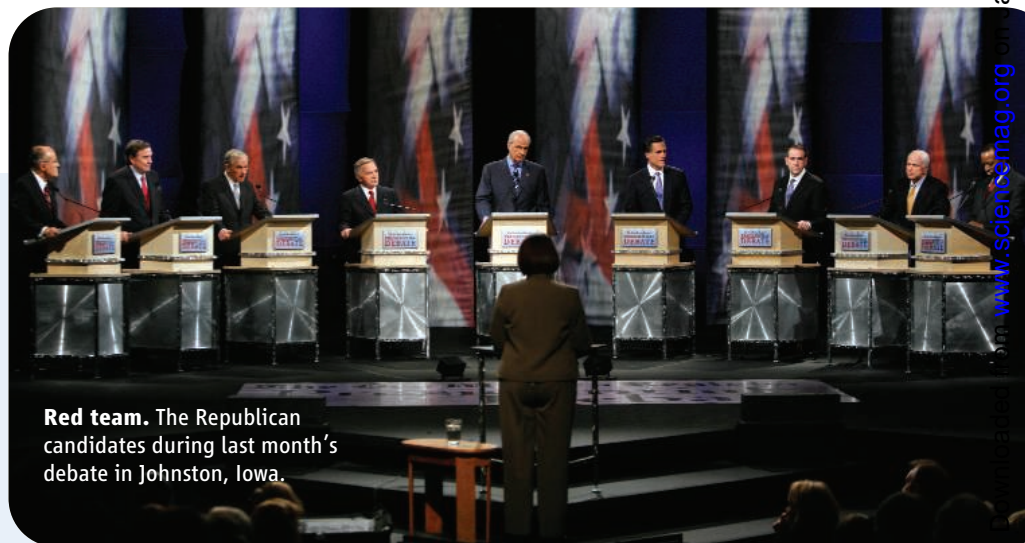
Asked today about Edwards’s courtroom tactics, his staff points to statements from his vice presidential campaign. Speaking then about his legal team, Edwards claimed that “we would take months investigating” any brain-injury case before deciding whether to accept it. And he said he only litigated those that “were merited.”

—JOCELYN KAISER AND ELIOT MARSHALL

DEMOCRAT JOHN EDWARDS

Home State: **North Carolina** Web site: **johnedwards.com**

Most Recent Job: **Consultant, Fortress Investment Group** Age: **54**



Red team. The Republican candidates during last month’s debate in Johnston, Iowa.

indicate that the 5-year survival rates are about 77% for Britain and 98% for the United States. What this shows, according to biostatistician Donald Berry of the M. D. Anderson Cancer Center in Houston, Texas, is that U.S. doctors screen and diagnose more patients, finding prostate cancer in people not at risk of dying from it, and that “there is no credible evidence that screening decreases prostate cancer mortality.” The Giuliani campaign has said it won’t stop using the original ad data.

Giuliani’s campaign has skated lightly over most issues with scientific and technological components. On energy, for example, he would boost all domestic energy sources, emphasizing coal, nuclear power, ethanol (with a goal of 20% more output), and renewable sources such as windmills, but he has not spelled out how this would work. Likewise, his pledges to “promote science and mathematics through technical certification or an associate degree” and “expand the number of H-1B visas for skilled foreign workers” come with few details. The League of Conservation Voters reports that Giuliani has “no articulated position” on most of the environmental issues it tracks. Giuliani has said, “I do believe there’s global warming,” but he has not spelled out his response to the problem.

—ELIOT MARSHALL