To err is human
A couple of minor carps about your otherwise enjoyable magazine, which recently came to my mailbox.
A caption to the photograph of James D. Watson refers to “...the double helix structure of genes.” This is not correct. A gene is in RNA, which is transcribed from DNA, whose double helix structure was deduced by Watson and Crick. In “New path to an old bug,” the first paragraph reads: “Capturing iron is a crucial step...” How the microbe has grown ominously resistant to antibiotics? Capturing iron is a process that the bacteria must have been doing for millions upon millions of years; it is fundamental to its survival. That’s the way it lives, but what has it to do with growing “ominously resistant to antibiotics?” The resistance, by whatever mechanism, is a very recent adaptation to the assaults of antibiotics. Unless you can state that the iron-capturing is a new phenomenon in the life of the bacterium, the sentence as written is incorrect. Robert Evans, PhD Davis, CA
Evans is correct; the caption to the story “After the double helix” should have read: “Watson and Crick discovered the double helix structure of DNA.” And to clarify the story title: “...new path to an old bug,” capturing iron is a critical step in how this disease-causing bacterium causes life-threatening infections and knowing how could provide a new target to treat this persistent pathogen.

Emerging pathogens to be studied
The Centers for Disease Control and Prevention awarded four universities, including the University of Chicago, a $3 million grant to study community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA). Concerned about increasing reports of the disease, the CDC is placing the pathogen high on its priority list. The university’s principal investigator, Robert Daum, section chief for pediatric infectious diseases, has assembled a team that will use a variety of molecular techniques to assess the latest of MRSA for their virulence. Daum’s team will receive $250,000 annually for three years to study clinical, epidemiological and molecular characteristics of CA-MRSA. Also participating in the project are Columbia University, Harbor-UCLA Research & Education Institute and the University of California, San Francisco.

Gastroesophageal Reflux Disease (GERD)
A new minimally invasive procedure is helping children with gastroesophageal reflux, disease (GERD). Performed in Chicago only at the University of Chicago Children’s Hospital, the Stretta procedure is a one-hour outpatient surgery that allows most patients to resume normal activities the next day. According to pediatric surgeons Donald Liu, each year several thousand American children are diagnosed with GERD, which causes irritation and pain in the esophagus. If left untreated, can lead to esophagitis or cancer. The Stretta System lowers a tiny video camera through the mouth along with a catheter that emits radiofrequency energy, which narrows the opening in the area where the esophagus meets the stomach. A tighter valve in the gastroesophageal junction helps prevent reflux and, in most patients, reduces esophageal acid by 90 percent within six months. Children ineligible for Stretta can be helped with laproscopic surgery, which requires only tiny keyhole incisions in the abdomen.

Disease initiatives
The National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, has awarded more than $50 million to the University of Chicago for two major projects to combat infectious diseases. Chicago will be the lead institution for a Regional Center of Excellence (RCE) for Biodefense and Emerging Infectious Diseases Research. The other major project is to help build a Regional Biocontainment Laboratory.
The RCE, a collaborative effort including researchers from the University of Chicago, Northwestern University, Argonne National Laboratory and 11 additional upper-Midwestern universities, hospitals and research organizations, will be one of eight regional centers funded by the NIAID to battle infectious disease. A five-year, $35 million grant will support the Midwestern RCE, which will be headed by Olaf Schneewind, MD, PhD, professor of molecular genetics and cell biology and chairman of the committee on microbiology at the University of Chicago, and Robert Murphy, MD, the John P. Flue Professor of Infectious Diseases at Northwestern University Medical School.

While this project has been driven by recent concerns about bioterrorism, the knowledge we will gain from it could have a significant impact on humanity’s eternal battle against all infectious diseases.

Olaf Schneewind, Professor of Molecular Genetics and Cell Biology

In addition to performing research, the RCE will act as a regional resource for public health officials, providing expertise, rapid diagnosis, support and advice about containment and treatment in the event of a bioterror outbreak or the emergence of new diseases. It also will teach young scientists and technicians how to conduct productive and safe research on infectious diseases.

Chicago’s RCE will focus on the development of diagnostic, therapeutic and vaccine products for anthrax, botulism, tularemia, hemorrhagic fever viruses and bubonic plague.

The RCE will extend that approach to the study of emerging diseases. It also will help public health officials, providing advice about containment and treatment in the event of a bioterror outbreak or the emergence of new diseases.

Olaf Schneewind, Professor of Molecular Genetics and Cell Biology

Much of what we know about the biology of our own cells comes from the study of microbes that disrupt those processes,” said James Madau, MD, dean of the Division of the Biological Sciences and the Pritzker School of Medicine at the University of Chicago. “What better way to learn more than to focus on the organisms that have the maximum effect on those critical pathways?”

The Midwestern RCE pulls together research teams from 14 institutions in the six states in the federally designated Region V. The research teams will involve more than 300 scientists, including a core of more than 60 specialists in microbiology, infectious diseases, public health, medicine, vaccine research and pharmacology, as well as related disciplines such as biochemistry, computer science, engineering, mathematics and nanotechnology.

“This fits well into our continuing efforts to encourage innovative research that crosses boundaries, bringing together specialists from many different disciplines, including the physical and even the social sciences,” Madau said. “The RCE will extend that approach to crossing institutional boundaries.”

Letters continued
India’s first dinosaur

He’s called Rajsaurusrnemostis, which means “regal dinosaur from the Narmada,” and he is the first skull ever assembled of a dinosaur of any kind from India. Dinosaur skeletons are rare in India partly because the terrain renders many key geological formations inaccessible to digging, according to University of Chicago paleontologist Paul Sereno.

Though scant traces of the species had been collected over the past century, a discovery of bones near the Narmada River in western India in 1989 provided the missing pieces. Full reconstruction was not possible until Sereno, Jeff Wilson, PhD ’99, of the University of Michigan and Indian researchers poured over a map of the position of each skull fragment as it was discovered. Rajsaurus, a stocky, 30-foot-long carnivorous predator, would have pursued a diet that included the long-necked sauropod dinosaurs that roamed the Narmada region. It is related to species on continental Africa, Madagascar and South America.

“Together we will be able to pool our resources and develop novel diagnostic tests, vaccines and treatment against the agents of bioterrorism and emerging infectious diseases.”

Participating institutions are the University of Chicago, Northwestern University Argonne National Laboratory, Battelle Memorial Institute, Illinois Institute of Technology Research Institute, Mayo Clinic, Medical College of Wisconsin, Michigan State University, Notre Dame University, Purdue University, University of Illinois at Chicago, University of Illinois at Urbana-Champaign, University of Michigan and the University of Wisconsin at Madison.

Supporting these institutions will be a Regional Bioscience Laboratory to be built at Argonne National Laboratory. The NIAID provided a $37 million grant to the University of Chicago to build the lab; the university will acquire an additional $13 million from other sources to complete it. It is one of nine regional and two national biosurveillance laboratories announced by NIAID.

“Building this new biosafety laboratory will help transform the Midwest into a center for microbiology research and permit us and our partner institutions to take full advantage of the unique structural biological and computational resources already in place at Argonne,” said Thomas Rosenbaum, the University of Chicago’s vice president for research and Tor Argonne.

To be called the Howard T. Ricketts Laboratory, the biosafety lab’s research will be broad, encompassing the detection, prevention and elimination of emerging diseases such as West Nile fever and drug-resistant tuberculosis along with influenza, bubonic plague and other perennial threats to human health.

“Few laboratories in the United States are capable of safely working on multiple microbes that cause diseases such as anthrax, plague and hemorrhagic fever,” Schweirzer said. “The express purpose and specific design of the Regional Bioscience Laboratory is to generate the very best science and technology in a central, state-of-the-art facility to produce drugs, vaccines and diagnostic devices to counter bioterrorism and emerging infectious diseases.”

Small laboratories already exist at Chicago and Argonne for safely studying infectious microbes, but the new 27,508-square-foot laboratory will enable researchers to simultaneously study four or more different pathogens.

The laboratory is named for Howard Rickets (1871-1910), a university microbiologist who discovered the organisms that cause Rocky Mountain spotted fever and typhus. For more information about the lab, access http://www.hrtl.uchicago.edu.

— John Easton and Steve Kappes

Sleep impacts language

Sleeping has an important and previously unrecognized impact on improving people’s ability to learn language, University of Chicago scientists have found.

Although scientists have long hypothesized that sleep has an impact on learning, the new study reported in the Oct. 9 issue of the journal Nature is the first to provide scientific evidence that brain activity promotes higher-level types of learning while we sleep.

“Sleep has at least two separate effects on learning,” wrote the authors, Howard Nusbaum, professor of psychology; Daniel Margolis, professor in organlmal biology and anatomy; and researcher Kimberly Fenn. “Sleep consolidates memories, protecting them against subsequent interference or decay. Sleep also appears to ‘recover’ or restore memories.”

Although the study dealt specifically with learning words, the findings may be relevant to other learning.

“We have known that people learn better if they learn smaller bits of information over a period of days rather than all at once,” Nusbaum said. “This research could show how sleep helps us retain what we learn.”

The idea for the study arose from discussions Nusbaum and Fenn had with Margolis, who studies how birds learn songs. (See related stories on pages 9 and 16.)

For the human study, the team tested college students’ understanding of a series of common words produced by a voice synthesizer in a mechanical, robotic way that made the words difficult to understand. They first measured the students’ ability to recognize the words. They then trained them to recognize the words by the pattern of sounds the synthesizer was making and tested them again to see how effective the training was.

The team tested three groups of students. The control group, tested one hour after they were trained, recognized 54 percent of the words — 31 percentage points higher than they had scored before training.

The scientists next trained students at 9 a.m. and tested them 12 hours later.

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These students made a 10-percentage point gain over their pre-training scores.

A third group was trained at 9 p.m. and tested the next morning. After a night’s sleep, those students improved their performance by 19 percentage points over their pre-training scores.

The students who were trained at 9 a.m. were tested again after a night’s sleep, and their scores improved to the same level as the other students who had been trained in the evening.

“We were shocked by what we found,” Nusbaum said. “We were particularly intrigued by the loss of learning the students experienced during the day and then recovered.”

Researchers could not determine if the reduction in performance during the day

Clinical trials not always colorblind

Although African Americans have less access to health care in general, a new study shows that African-American children are overrepresented in research, including clinical trials. Co-authored by pediatrician and clinical ethicist Lainie Ross of the University of Chicago, the study also showed that white and Hispanic children are underrepresented in clinical trials. Although 69 percent of the U.S. population is white, just over 90 percent of children in medical research and clinical trials are white. Language barriers and the way race and ethnicity data are reported, she said, might lead to the underrepresentation of Hispanics, who account for just 16 percent of children in medical research but 17 percent of the general population. The location of academic medical centers in urban rather than rural areas may contribute to some discrepancies. The study cautions, however, that benefits from participation in research do not translate into clinical care.

New weapon against AIDS

A drug developed to relieve one of the major side effects of pain therapy for cancer patients may offer an added benefit for AIDS patients, researchers from the University of Chicago and the Children’s Hospital of Philadelphia reported in the 2003 annual meeting of the American Society of Anesthesiologists.

Methylthiopentone (MNTX) was invented to reverse the constipation caused by powerful, opiate-based pain relievers such as morphine, OxyContin or Percocet — taken by patients with cancer or AIDS.

The study, conducted at Chicago by anesthesiologist Jonathan Moses, found that MNTX interferes with the AIDS virus’s ability to infect specific immune system cells, HIV uses the CD4 and CCR5 molecules on cell surfaces as portals of entry. Opium increases the expression of CCR5 receptors, thereby making immune cells more susceptible to viral infection. Though not a cure, MNTX, at very low doses, blocked these increases.

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**Noteworthy**

**Vinay Kumar**, MD, professor and chairman of pathology, was elected a 2003 fellow of the American Association for the Advancement of Science. He was cited for pioneering studies on the delineation of the existence of a novel subset of lymphoid cells called natural killer cells.

**Wen-Hsiung Li**, PhD, the George Wells Beadle Distinguished Service Professor of Ecology and Evolution, recently was elected to the National Academy of Sciences in recognition of his distinguished and continuing achievements in original research. Li also was awarded the prestigious Balzan Prize in genetics and evolution by the International Balzan Foundation. With an award of $709,000, Li is one of four people worldwide to receive the Balzan Prize — often referred to as the “Italian Nobel” — this year for contributions to science and humanities.

**David Meltzer**, PhD, associate professor of medicine and associated faculty member of economics, has been recognized by the Society of Hospital Medicine for his outstanding research and medical contributions in the area of hospital medicine. The SHM presented Meltzer with the Young Investigator Award for several recent research achievements and for his continuing promise as a young researcher.

**J. Michael Millis**, MD, associate professor of surgery, recently received the Physician Recognition Award from the American Liver Foundation for his distinguished and continuing service to the health care of women and infants.

**Atef Moawad**, MD, the Blum-Rese Professor Emeritus of Obstetrics and Gynecology, was honored by the Chicago Lying-In Hospital Board of Directors with the Joseph Bolivar DeLee Humanitarian Award, which is presented annually to those who have made an extraordinary contribution to the health care of women and infants.

**Fredric Wondisford**, MD, chief and professor of endocrinology, received the Outstanding Investigator Award 2003 from the American Federation for Medical Research. The award recognizes Wondisford’s work, “Thyroid Hormone Action: Insight from Transgenic Mouse Models,” recently published in the Journal of Investigative Medicine.

**Manyuan Long**, PhD, assistant professor of ecology and evolution, received a prestigious CAREER award from the National Science Foundation. The award, which provides nearly a million dollars over five years, supports his evolutionary genetics research of rates and patterns of novel genes in fruit flies.

**Wen-Hsiung Li**, PhD, Research Associate, Princeton University, has been awarded the American College of Physicians’ Career in Research Award for his research in molecular biology, recently was inducted into the University of Delaware’s Alumni Wall of Fame, honoring his distinguished professional endeavors. His research in areas such as protein crystallography and the understanding of metabolic regulations of the human growth hormone and alternate structures in Alzheimer’s disease has led the field of protein research.

**William R. Pounds**, MD, professor of oncology, has been appointed the first holder of the chair in breast cancer research in the area of molecular biology. His laboratory is working on the development of new ways to treat breast cancer. His research includes the development of new ways to treat breast cancer and the development of new ways to treat breast cancer. His research includes the development of new ways to treat breast cancer and the development of new ways to treat breast cancer. His research includes the development of new ways to treat breast cancer and the development of new ways to treat breast cancer. His research includes the development of new ways to treat breast cancer and the development of new ways to treat breast cancer. His research includes the development of new ways to treat breast cancer and the development of new ways to treat breast cancer.

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will sing the same motif a few times, then switch to a new repeated motif, and then another, as long as he can keep it going.”

When other starlings are learning which songs belong to whom, they do it by concentrating on the motifs, he said.

To examine the neural mechanisms associated with auditory memory, Genicker and Margoliash conducted experiments with starlings trained to recognize several songs. The researchers measured the electrical impulses from single nerve cells in the auditory area of the bird’s brain known as cmHV — an area analogous to the higher-order, secondary auditory cortex in humans.

The researchers recorded the response of each neuron to songs the bird had learned to recognize, to unfamiliar songs the bird had never heard before and to synthetic sounds. The cells responded much more strongly to the songs the bird had learned to recognize than to any of the other sounds. Individually, a majority of the cells responded to only one song, and almost all (95 percent) of these cells responded to one of the songs the bird had learned to recognize. After examining the data even more closely, they found that many of these cells only responded to specific motifs in a familiar song.

“[Motifs] are the books that make up the starlings’ library of memories,” Margoliash said, “and we’re learning how the starling represents those books in his brain.”

— Catherine Gianaro

Heart-liver-kidney transplant

On May 21, 2003, after seven months of waiting, including nearly six weeks in the hospital, 40-year-old Michael Gaynor of Chicago received a new heart, liver and kidney at the University of Chicago Hospitals. He is the fourth patient in the United States to undergo this complex multi-organ transplant and the third at the University of Chicago.

Gaynor’s heart and liver damage were caused by a rare, inherited metabolic defect called glycogen storage disease (GSD) type IIIa, also known as Forbes’ disease, which gradually damages the liver and muscles, including the heart. The kidney damage resulted from insufficient blood flow caused by his severe heart failure. Transplantation not only should give him healthy functioning organs but also eliminate some of the worst consequences of his GSD, doctors said.

During his six weeks in the hospital waiting for a transplant, “Mr. Gaynor made us pretty nervous,” said Allan Anderson MD, assistant professor of medicine and director of the heart-failure program. “He was really quite sick. He could have died from his heart failure, and would have if he had had to wait a few more weeks. He required a lot of preoperative attention, including multiple IV medications to support his circulation and control his pulmonary hypertension.”

The transplant operations began at about 7:30 a.m. The cardiac team performed the heart transplant first. A second surgical team, led by David Cronin, MD, PhD, assistant professor of surgery, performed the liver transplant. Once the liver transplant was completed, the heart team returned to close the chest incision. Then Cronin’s team closed their incision, and a team led by J. Richard Thistlethwaite, MD, PhD, professor of surgery, performed the kidney transplant, which was completed by about 9:30 p.m.

Gaynor recovered well and was awake, alert and breathing on his own the day after his 14-hour surgery. A few days later, he sat up in a chair and walked a few steps. Nearly 18 months later, Gaynor is home and doing well.

— John Eston

New species of salamander

A 161 million-year-old Mongolian fossil not only reveals a new species of salamander, but also provides proof that much of the evolution of salamanders occurred in Asia.

Scientists from the University of Chicago and Peking University in Beijing collected thousands of salamander fossils, many of which preserve the entire skeleton and impressions of soft tissues, for more than three years from seven excavation sites in Mongolia and China. Prior to the discovery in 1996 of the Chinese sites, scientists had complete salamander fossils dating only to the Tertiary period, which began 65 million years ago.

“It’s remarkable to have the earliest-known salamanders with so much diversity, so many specimens and such high-quality preservation,” said Neil Shubin, PhD, professor of the other chairman of organismal biology and anatomy at Chicago and lead author of the study. “Usually when you find the earliest-known animal, you only have one representative. But we have thousands. It’s a real opportunity to look at how salamanders have evolved.”

To date, the scientists have discovered five new species of salamanders from the Asian sites — one of which, Oberpseudotripteron, is described in the March 27, 2003, issue of the journal Natur.

According to the paper, the newly found species closely resembles the North American hellbender, a common salamander currently found both in Asia and in the Allegheny Mountains near Pittsburgh, Penn.

Variations in the fossil animal include the shape of the bones in the front of the skull, the features of the fingers and toes, and the shape of the ribs. The fossil salamander bears “unicapitate” ribs, meaning the rib has only one facet, or head, where it connects to the vertebra.

Most modern salamanders have two-headed ribs.

New drug therapy helps cancer victims

A new combination drug therapy can benefit patients with mesothelioma — cancer of the lining of the lung. In a Phase III study published in the Journal of Clinical Oncology in July, patients treated with a combination of cisplatin and a newer drug called pemetrexed lived longer and had less pain and shortness of breath than those who received cisplatin alone. Pemetrex is a cousin of methotrexate, used to treat other kinds of cancer. Nicholas J. Vogelzang, University of Chicago hematologist/oncologist and study director, said those treated with the drug combination lived about a year — nearly three months longer than those who received only cisplatin. Most cases of mesothelioma, a rare and lethal form of cancer that occurs in cells lining the lungs, are caused by asbestos exposure. About 8,000 new cases occur each year in the United States.

University scientists discovered the fossil of a new salamander species, Chozepasagadungsi (above), in Mongolia. The pencil-long amphibian lived 161 million years ago, making it the oldest-known salamander fossil and pinning the species’ origins to Asia. This well-preserved salamander fossil of a small larval cryptobranchid (above) reveals the animal’s eye, fins in the tail and a stomach lugging with clams.

Breast cancer’s silver lining

Breast cancer survivors may be one-third less likely to have a heart attack than other women, according to a University of Chicago study directed by hematologist/oncologist Elizabeth Lamont, formerly of Chicago and now at Harvard Medical School. She used data from the National Cancer Institute’s Surveillance, Epidemiology and End Results to compare 9,960 women aged 67 or older who had survived postmenopausal, early-stage breast cancer to a group of 93,165 women who had never had cancer.

Women with breast disease risk factors showed greater benefits. Higher natural levels of estrogen, which can increase breast cancer risk, combined with the anti-cancer drug tamoxifen (a drug many breast cancer survivors take to decrease their risk of recurrence) may explain the reduced risk of heart attack. The protective effect was slight — less than 16 percent — in women at low risk for heart disease, but was 50 percent or greater in those with cardiac risk factors.

Heart liver kidney transplant

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Although multi-organ transplants have become more common, they still present a logistical challenge. “To make it work, we had to transplant the heart in such a way that it could immediately withstand the stresses of major abdominal surgery,” said Vallavan Jeevanandam, MD, professor of surgery and section chief of cardiac surgery, who has performed more than 700 heart transplants.

Gaynor’s operation was made even more difficult because the combined effects of high blood pressure associated with his heart failure and clotting problems caused by liver failure increased the risk of excessive blood loss. “We had to be super meticulous about bleeding,” Jeevanandam said.

The transplant operations began at about 7:30 a.m. The cardiac team performed the heart transplant first. A second surgical team, led by David Cronin, MD, PhD, assistant professor of surgery, performed the liver transplant. Once the liver transplant was completed, the heart team
Evolutionary biologists will appreciate this fresh, new, quantitative approach to evolutionary reproductive behavior and sex selection, an approach informed by genetics. Sexual selection is a powerful evolutionary force and the authors offer “the first unified conceptual and statistical framework for understanding the evolution of reproductive strategies,” according to the publisher. Shuster and Wade also apply their statistical framework to alternative mating-strategy patterns and take into account the effects of life history and ecological processes. Challenging existing research methods, they propose areas for future research on reproductive behavior and question studies that do not quantitatively reference evolutionary genetics.

After earning a doctorate in theoretical biology from the University of Chicago in 1975, co-author Michael John Wade became an assistant biology professor for the university and in 1991 was named chairman of the ecology and evolution department. He is now a biology professor at Indiana University, Bloomington. Shuster is a professor of invertebrate zoology in the biological sciences department at Northern Arizona University.

A volcanic eruption in northern China during the Middle Jurassic period (165 million to 180 million years ago) provided key material for the fossil, which predates the previously oldest-known salamander by 100 million years. The eruption wiped out whole communities of the earliest-known salamanders but left thousands of beautifully preserved fossils.

According to Shubin, the presence of Olmmouthus in the Middle Jurassic period of China implies that the split between the two oldest families — lissamphibians and cryptobranchids — occurred in Asia.

“What this tells us,” Shubin said, “is that the major families of salamanders are probably relatively ancient. The distribution of the families today is a relic of what happened in the distant past.”

“The diversity of species in this find, combined with molecular data and study of characteristics from living salamanders, leads to the inescapable conclusion that almost all the major groups of salamanders evolved very early,” he said. “And not much has happened since.”

Fieldwork was supported by the National Geographic Society; a grant from the National Science Foundation supports the lab analyses of the fossils. The National Science Foundation supports the lab analyses of the fossils.
with each other. Even if they're not believing it, they're at least learning how to formulate the argument, he said. “You leave at the end of the hour thinking you're doing what you always wanted to do and you're fighting the good fight,” Cooper said.

The classroom teachers also feel that there's something special about having a scientist visit the classroom.

“My students have really connected with Jim and they feel strongly that the work they are doing is something they want him to see and approve,” Bennett said. “These kids might see a real fireman, a real lawyer, but they hardly ever see a real scientist. This program lets a scientist enter the classroom in a personal, informal and casual way, and say to the kids, ‘You can do this!’”

-Susan Seric

Bipolar disorder and schizophrenia

A research team based at the University of Chicago has traced increased susceptibility to bipolar disorder to two overlapping genes. The study, published in the May 2003 issue of the American Journal of Human Genetics, is the first to implicate this gene complex, and the second to tie genes to bipolar disorder, which affects two million American adults.

A previous study found that the same gene complex increases risk for schizophrenia. The current finding adds credence to the emerging notion that the same genes may contribute to both disorders. “The discovery of susceptibility genes for psychiatric disorders has been one of the most intractable problems in human genetics,” said Elliot Gershon, professor and chairman of psychiatry and co-author of the study. “In the past two years, we seem to have reached a watershed for psychiatric gene discovery, with the identification of genes that increase risk of bipolar disorder and schizophrenia. After years of false starts and unfulfilled promises, we have begun to make real progress.”

Bipolar disorder, also known as manic-depressive illness, is a brain disorder that causes profound shifts in a person's mood, with spurts of energy and elation alternating with longer periods of fatigue and sadness. It affects about 1 percent of adults, usually beginning in late adolescence.

The genes identified in Gershon’s research seem to increase susceptibility to the disease by about 25 percent, he said.

Gershon’s team, headed by research associates Eiji Hattori and Chunjyu Liu, studied more than 800 individuals in 174 American families in which several members have bipolar disorder. Using a technique called “positional cloning,” which tracks down risk-bearing genes by identifying small differences between family members who have a disease and those who do not, they implicated the genes known as G30 and G72, found on the long arm of chromosome 13. G30 and G72 are “rather strange genes,” said co-author Hattori. They are expressed only in primates, with no counterpart in mice. They have no known function. They reside in a sort of “gene desert,” near the end of the chromosome with no other genes nearby, and they overlap on complementary chromosome strands.

The G72/G30 gene complex was discovered at Genentech Corporation, which reported association of this complex with schizophrenia in fall 2002.

—John Easton

Rite of passage

A recent scientific finding may some day put the Tooth Fairy out of business. Exfoliated baby teeth are a potential source for stem cells, according to a study recently published in the Proceedings of the National Academy of Sciences edited by University of Chicago molecular geneticist Anthony Mahowald. The study demonstrated that the pulp around the root of a baby tooth contains a wealth of stem cells that can be grown into bone, teeth, fat and brain cells. Though embryos remain the best source of stem cells—a matter of considerable ethical debate—Mahowald believes the discovery could make stem cells more accessible in the future. “They may have great therapeutic potential, they’re easily accessible, they grow quickly, and they present no problems with immunorejection,” he said. “Some day individuals may be banking cells from their baby teeth for future use.”

Drier may be better

A discovery by University of Chicago researchers of a new sticky force that can bind together proteins may lead to more effective drug design. Visiting biochemist Ariel Fernandez and mathematician Ridgeway Scott announced their discovery in Physical Review Letters. The pair studied the hydrogen bonds of proteins, which must stay dry to remain strong. They discovered that the strong bonds are wrapped in amino acid side chains that do not interact with water. The unraveled or defective bonds are the ones most likely to become the sites where proteins would bond. The research provides insight into the molecular basis of cancer and amyloid-forming diseases such as Alzheimer’s, which are caused by genetic accidents. The discovery could lead to drugs that prevent harmful proteins from attaching to one another.

Year of discovery

“Chicago’s Lifeline,” an award-winning Discovery Health Channel series that chronicles life-and-death stories at the University of Chicago Hospitals, enters its second season this spring. Each episode of the eight-part series profiles patients, staff and university physicians. Their unscripted human dramas earned “Chicago’s Lifeline” the prestigious Freddy Award twice from the American Medical Association for “Best Medical Reality Series” during its 1999-2000 inaugural season.