



Illustration: Matt Mullin

## Milestone Reached in Genetic Compilation

**F**or nearly two decades, the three leading public repositories for DNA and RNA sequence data have collaborated to provide access to the ever-increasing amount of genetic data produced by institutions around the globe. The three repositories have now reached a significant milestone by collecting and disseminating 100 gigabases of sequence data. For a frame of refer-

ence, 100 billion bases is about equal to the number of nerve cells in a human brain and a bit less than the number of stars in the Milky Way.

These bases, or “letters” of the genetic code, represent both individual genes and partial and complete genomes of more than 165,000 organisms, according to a National Library of Medicine news release. While a single gene from organ-



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—TAKASHI GOJOBORI

isms as diverse as apple trees, bacteria, earthworms, elephants, fruitflies, and humans can range from less than 100 to more than several thousand bases long, an organism’s genome can be longer than 1 billion bases. The free access to this information allows scientists to study and compare the same data as their colleagues nearly anywhere in the world, and makes possible collaborative research that may ultimately lead to cures for diseases and improved health.

Thanks to their data exchange policy, the three members of the International Nucleotide Sequence Database Collaboration, GenBank in Bethesda, Md.; European Molecular Biology Laboratory’s European Bioinformatics Institute, EMBL-Bank in Hinxton, United Kingdom; and the DNA Data Bank of Japan in Mishima, Japan, all reached this milestone together.

GenBank is maintained by the National Center for Biotechnology Information, a part of the National Library of Medicine, National Institutes of Health. Submitters to GenBank currently contribute more than 3 million new DNA sequences per month to the database.

“Today’s nucleotide sequence databases allow researchers to share completed genomes, the genetic makeup of entire ecosystems, and sequences associated with patents,” said David Lipman, director of the National Center for Biotechnology Information. “The International Nucleotide Sequence Database Collaboration (INSDC) has realized the vision of the researchers who initiated the sequence database projects by making the global sharing of nucleotide sequence information possible.”

Graham Cameron, associate director of EMBL’s European Bioinformatics Institute, added, “This is an important milestone in the history of the nucleotide sequence databases. From the first EMBL Data Library entry made available in 1982 to today’s provision of over 55 million sequence entries from at least 200,000 different organisms, these resources have

anticipated the needs of molecular biologists and addressed them — often in the face of a serious lack of resources.”

While much has changed since the days when sequences were manually keyed in from the literature or sent on floppy disc and distributed to users on nine-track magnetic tapes, the purpose of the databases — to make every nucleotide sequence in the public domain freely available to the scientific community as rapidly as possible — remains as strong now as it did then.

Takashi Gojobori, director of the Center for Information Biology and DNA Data Bank of Japan, said: “The INSDC has laid the foundations for the exchange of many types of biological information. As we enter the era of systems biology and researchers begin to exchange complex types of information such as the results of experiments that measure the activities of thousands of genes, or computational models of entire processes, it is important to celebrate the achievements of the three databases that pioneered the open exchange of biological information.”

The National Center for Biotechnology Information is part of the National Library of Medicine. Established in 1988 as a national resource for molecular biology information, NCBI creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information all for the better understanding of molecular processes affecting human health and disease. NCBI is host to the GenBank nucleotide sequence database.

The National Library of Medicine, the world’s largest library of the health sciences, is a component of the National Institutes of Health, U.S. Department of Health and Human Services.

For more information online, go to <http://www.ebi.ac.uk/emb> for EMBL-Bank; <http://www.ddbj.nig.ac.jp/> about DNA Data Bank of Japan; and <http://www.ncbi.nlm.nih.gov> for GenBank on the NCBI website.

## Cavity-Causing Medications Not What the Dentist Ordered

While a spoonful of sugar helps the medicine go down, most dentists likely encourage parents to skip that step when treating a child's illness. This is because most parents are not aware some children's medicines can cause cavities, according to a report in an issue of *General Dentistry*, the Academy of General Dentistry's clinical, peer-reviewed journal.

Antihistamine syrups frequently are purchased over-the-counter or prescribed for treating the typical illnesses or chronic allergies. However, many of these syrups contain low pH levels and high acidity, which can be an unsavory recipe for a child's teeth. The sugar in the medicine, combined with the acids, dissolve dental enamel, causing erosion.

The report revealed that placing children's teeth in contact with syrupy medications could cause erosion to the outer layers of the teeth. However, when treated with a topical fluoride remedy, the decay was minimal.

"Although some medications are necessary for general health, they can be extremely harmful to the teeth if the



medicine is given at bedtime, or without following proper oral health habits," said Carolina Covolo da Costa, DDS, MSc, author of the study.

Since nature's buffer against cavities — saliva — decreases during the night, medications given before bed can do a great deal of damage if a child does not brush away the acids and sugar. A fluoride toothpaste can provide extra protection against decay. If brushing is not possible, rinsing the mouth with water can help minimize the risk.

### Tips for Giving Medication

- Give the medication at meal times instead of bedtime.
- Have the child rinse with water or chew sugar-free gum afterward.
- Have the child take calcium supplements or use a topical fluoride after using. (The parent should check with the child's pediatrician or dentist before giving any supplements.)

## Overall Health May Determine Dental Implant Success

Dental implants have become the treatment of choice for some patients to eliminate the need for removable partial or complete dentures. Other patients choose implants to conserve tooth structure or for esthetic purposes in an otherwise cavity-free mouth.

But according to a recent report in the issue of *General Dentistry*, the Academy of General Dentistry's clinical, peer-reviewed journal, the failure or success of an implant relies on a number of factors, including the quality of the patient's overall health.

Chronic problems such as tooth clenching and grinding, or systemic diseases such as uncontrolled diabetes can decrease the success rate for implants in individuals with such problems. Also, individuals who smoke heavily or abuse alcohol may not be ideal candidates for the procedure.

"You must have good bone quality and a lack of chronic periodontal disease for the implant to stay in place," said lead author Judith A. Porter, DDS, MA, EdD. "Patients are unaware that bone loss in their jaw will often follow the loss of a tooth. When that happens, over time, bone loss can cause facial changes and diet changes."



Photograph: Ray Olson

## Correction

In the Impressions section of the December 2005 *CDA Journal*, Leon Assael, DDS, professor at the Oregon Health and Science University School of Dentistry, was misquoted. The information available for use in the Impressions section was incorrect. Bisphosphonates produces bone destruction.

## Holey Practice Presents Health Complications

Oral piercing is as old as civilization, but its increasing prevalence today means dentists should be aware of the complications, risks, and dental implications frequently associated with such procedures, said Jennifer Choe, DDS; Khalid Almas, BDS, MSc; and Robert Schoor, DDS, in the fall 2005 issue of *The New York State Dental Journal*.

The report recounted a treatment plan, using a case study involving a 26-year-old male patient with localized gingival recession and inflammation associated with tooth No. 25, directly opposite a tongue stud. The authors believed their findings “strongly implicate the piercing as the primary factor in this localized traumatic periodontitis.”

They presented a list of possible adverse consequences and common complications from oral piercing, including oral pain, disease transmission, edema, infection, airway obstruction secondary to swelling, chipped or fractured teeth, prolonged



bleeding, mucosal or gingival trauma, interference with mastication and swallowing, speech impediment, hyppersalivation, hyperplastic or scar tissue formation, nerve damage and paraesthesia, aspiration of specific piercing jewelry, and foreign body incorporation.

“The patient in this case report represents a situation that will occur more frequently as the popularity of tongue piercing increases,” the authors said.

## Classifying Injuries from Blasts

Acknowledging that dentists’ role in aiding people hurt in terrorist attacks likely is reserved for immediate triage, a group of physicians published a review in the *New England Journal of Medicine* discussing the characteristics of contemporary explosive devices and the spectrum of injuries inflicted by explosions and blasts. The authors noted that bomb attacks require triage according to the model of “urgent, immediate, delayed, minimal, or expectant care.”

The authors, led by Ralph DePalma, MD, named four types of blast injuries: primary, secondary, tertiary and quaternary.

Primary blast injuries are caused by barotraumas, either underpressurization or overpressurization relative to atmospheric pressure. Primary blast injuries most commonly involve rupture of the tympanic membrane, damage to the respiratory system and damage to the colon or, less frequently, the small intestine. Eyes, too, are susceptible to damage from excessive atmospheric pressure. Because the ear-



drum can be affected by atmospheric pressure, the authors noted its condition could help health care professionals determine the extent of the blast and the likelihood of further internal damage.

Secondary blast injuries are penetrating injuries from fragments (either as a result of the blast or as part of the weapon). Penetrating injuries are the leading cause of death in both civilian and military terrorist attacks.

Tertiary blast injuries are those caused by structural collapse following an explosion, leading to blunt or crushing trauma.

Finally, quaternary blast injuries refer to illnesses, injuries, and diseases related to the initial blast. These can range from toxic inhalation, burns, exposure to radiation, asphyxiation and inhalation of dust containing asbestos or coal.



## Honoring Volunteers Abroad

The deadline to nominate individuals for the Certificate of Recognition for Volunteer Service in a Foreign Country is March 31.

The ADA Committee on International Programs and Development is accepting nominations for dentists and dental students who have spent at least 14 days in a two-year period performing dental services in a foreign land. Nominations must be submitted by a state or local dental society, the federal dental service, or a dental school.

For more information or to obtain an application, contact the ADA Center for International Development and Affairs via e-mail, [international@ada.org](mailto:international@ada.org), or call (800) 621-8099, Ext. 2726.

## Dentists Who Treat Kids Can Play a Role in Fighting Obesity

Pediatric dentists have an important role in fighting the recent upswing in childhood obesity, and their role should stem from the dentist's concern for their patient's overall health, said William Vann, DMD, MS, PhD; Jessica Lee, DMD, MPH, PhD; Thomas Bouwens, and Antonio Braithwaite in *Pediatric Dentistry*.

In the article, the authors urged pediatric dentists to heighten their staffs' awareness by relying on the recently adopted American Academy of Pediatric Dentistry Policy on Dietary Recommendations for Infants, Children, and Adolescents.

"This AAPD policy is most timely and relevant for young children," the authors wrote, citing new evidence that "the first three years of life may lay the groundwork for obesity. In short, the nutritional risk assessment that is integral to the age 1 dental visit may offer health benefits far beyond those related to caries prevention."



## Upcoming Meetings

### 2006

<b>March 1-6</b>	American Academy of Dental Practice Administration annual meeting, Dana Point, Calif., (800) 689-7515.
<b>March 10</b>	Pacific Coast Society of Orthodontists Central Regional Meeting, San Ramon, (415) 441-4697.
<b>March 15-18</b>	Academy of Laser Dentistry's 13th Annual Conference and Exhibition, Tucson, <a href="http://www.source2006.org">www.source2006.org</a> .
<b>March 26-April 1</b>	United States Dental Tennis Association Spring Meeting, St. Petersburg, Fla., <a href="http://www.dentaltennis.org">www.dentaltennis.org</a> .
<b>April 27-30</b>	CDA Spring Session, Anaheim, (866) CDA-MEMBER (232-6362).
<b>May 16-20</b>	American Academy of Cosmetic Dentistry 22nd Annual Scientific Session, San Diego, (800) 543-9220.
<b>May 22-27</b>	Academy of Prosthodontics 88th Annual Scientific Session, San Francisco, <a href="http://www.academyprosthodontics.org">www.academyprosthodontics.org</a> .
<b>Sept. 15-17</b>	CDA Fall Session, San Francisco, (866) CDA-MEMBER (232-6362).
<b>Oct. 16-19</b>	ADA Annual Session, Las Vegas, (312) 440-2500.
<b>Dec. 3-6</b>	International Workshop of the International Cleft Lip and Palate Foundation, Chennai, India, (91) 44-24331696.

To have an event included on this list of nonprofit association meetings, please send the information to Upcoming Meetings, *CDA Journal*, 1201 K St., 16th Floor, Sacramento, CA 95814 or fax the information to (916) 554-5962.