

Year's comments for 2000

When INTERNATIONAL MICROBIOLOGY is about to start its fourth year of publication let us comment on what has been the 2000 outstanding news in microbiology and in biology in general. At the turning of the century (and millennium), a major breakthrough in biology has taken place that has cast a shadow over other major scientific goals. On June 26, 2000, US president Clinton and British Prime Minister Tony Blair—the White House and Downing Street were linked via satellite—made it public the achievement of the first step of the Human Genome Project. The first winning post in a race with participation of public and private research teams from different countries had been reached. The developments of bioinformatics that made it possible to use the shot-gun approach, as well as strong competition among some teams involved in the project, have allowed to finish the sequencing well ahead of the deadline established when the Human Genome Project was launched in the United States.

In genomics, other outstanding goals were accomplished this year. *Science* published the sequence of *Drosophila melanogaster* on March 24. The journal devoted a special section to this breakthrough, as well as its editorial and other viewpoints. By November 1999, the sequencing of the fruit fly having already been finished, forty-five people (bioinformatics experts, protein specialists and *D. melanogaster* researchers) started to work to interpret the sequence. Also, by the end of 2000, the first plant genome sequence—that of *Arabidopsis thaliana*—has been published. Among prokaryotes whose sequences have been published also during 2000, three of them are worth mentioning because of some special features. *Buchnera* sp. (Shigenobu et al., *Nature* 407:81–90) is a bacterium symbiont of almost all aphid (Homoptera, Insecta) species, which is transmitted from generation to generation of

its host. So closed has this relationship between *Buchnera* and its host become, that neither of them can live and reproduce independently. The knowledge of this bacterium genome has allowed to understand the need for maintaining such relationship and why these organisms can no longer live separately. *Buchnera* (named after the pioneer symbiosis researcher Paul Buchner [1886–1978]) has the second smallest genome among those sequenced so far, and is considered a subset of the *Escherichia coli* genome. *Buchnera* lacks the genes for the biosynthesis of non-essential amino acids, whereas it can synthesize some vitamins and amino acids that are essential for its host (and that its host cannot synthesize). On the other hand, the host synthesizes glutamate and aspartate, two non-essential amino acid precursors of some essential ones produced by *Buchnera*. The metabolism of these organisms is thus complementary and they have become mutually dependent from the nutritional point of view.

The first public sequence of a free-living plant pathogen—that of *Xylella fastidiosa*—was reported by a consortium of several laboratories in the Brazilian state of São Paulo (Consortium of the Organization for Nucleotide Sequencing and Analysis, *Nature* 406:151–157). *X. fastidiosa* causes citrus variegated chlorosis, which affects citrus fruit; some strains also affect coffee, nuts and other fruits. It is a highly-specialized bacterium that multiplies in the foregut of some leafhoppers (small leaping homopterous insects, Cicadellidae), which spread it from plant to plant. The knowledge of the *X. fastidiosa* genome will allow to understand the host-pathogen interactions and thus help to prevent infections. This is the first sequencing carried out in a developing country, which shows that genomics is not the province of developed, technologically advanced countries.

The genome sequencing of *Vibrio cholerae* was reported on August 3 (Heidelberg et al., *Nature* 406:477–486). The *V. cholerae* genome is contained in two circular chromosomes, the smaller comprising about 1.07 megabases, and the larger some 2.96 megabases. This pathogen, which used to have its endemic focus in Asia, has been known for more than two millennia and has spread to other regions, causing seven global pandemics so far. Genes dedicated to essential cell functions are located mainly in the larger chromosome, chromosome I, which hosts also most genes associated with virulence, many of which have been acquired from other species. The knowledge of *V. cholerae* genome sequence will be a most useful tool both to understand the bases and evolution of pathogenicity and to develop new vaccines and drugs to fight cholera.

Other prokaryotes sequences published this year include *Chlamidia pneumoniae* AR39 (the sequence of strain CWL029 had been published in 1999); *Chlamidia trachomatis* MoPN (sequence of serovar D [D/UW-3/Cx] had been published in 1998); *Neisseria meningitidis* MC58 and *Neisseria meningitidis* serogroup A strain Z2491; *Pseudomonas aeruginosa* PAO1; and *Ureaplasma urealyticum*.

The recovery of Permian microorganisms whose spores had been kept in salt crystals buried for around 250 million years was reported in the October 19 issue of *Nature*. The recovered bacterium is a *Bacillus* sp., which is a halophile that can grow with salt concentrations up to 25%. The so-called “Jurassic” bacteria—described also as *Bacillus* sp. by Raúl Cano—, which in 1995 were reported to have been recovered from spores preserved in the guts of bees trapped in amber 25–40 million years ago in the lands that today are the Dominican Republic (see the picture of a termite in the cover of this issue), seem very young if compared with the Permian ones—thus, they would be either Miocen or Oligocen, not “Jurassic”.

Over the three years passed by since its launching, INTERNATIONAL MICROBIOLOGY has found its niche among microbiological publications. It has not tried to compete with first-rank journals in the specialty. However, it has not given up the aim to publish articles of quality, and some topics originally dealt with in their pages have later become hot topics in other journals. Let us mention the review on the evolutionary role of prions, which in the case of yeast prions seems to behave as inheritable genetic elements (see Ogayar and Sánchez,

Internatl. Microbiol. 1998, 1:183–190); this topic has been recently dealt with by other authors in *Nature*. Also the above mentioned *Buchnera* and some genetic aspects of its symbiotic relationship with its aphid host had been previously dealt in INTERNATIONAL MICROBIOLOGY (see Buades et al., *Internatl. Microbiol.* 1999, 2:11–14). The journal has maintained its two general sections: Articles (research papers and reviews) and Complements (editorials, perspectives and opinion articles, and book reviews). The Complements section has become very popular among its readers, maybe because it offers a miscellaneous on topics related to microbiology and scientific research that are not usually discussed in other journals.

INTERNATIONAL MICROBIOLOGY joined the commemoration of the 25th anniversary of the Federation of European Microbiological Societies (FEMS), which was officially celebrated in Sevilla, on September 16, this year. The SEM was honored to host both the 4th European Nitrogen Fixation Conference and the meeting of FEMS Council and the Jubilee. We requested Prof. Dr. Hans G. Trüper, Associate Editor of our journal, to write an Editorial devoted to such event (see INTERNATIONAL MICROBIOLOGY [2000] 3:135-137). Trüper produced a smart, interesting summary of FEMS historical background and development, commenting on its current policy and activities, as well as the connections and cooperation between the Spanish Society for Microbiology (SEM) and FEMS. On the occasion of the Jubilee, the first FEMS-Lwoff Medal was delivered to Prof. Philippe Sansonetti. This award, which includes an honorarium of 1000 euros, has been set up to honor the memory of Prof. André Lwoff, the first President of FEMS, and will be presented every second year to a member of a FEMS society for outstanding service to microbiology in Europe.

We have received 94 manuscripts throughout 2000. The four issues comprise 31 Articles and 10 Complements (without including book reviews), with a total of 272 pages. The journal is the result of the cooperation between authors and those who work in the editing and publishing process. The success of the outcome depends greatly on the raw material—the manuscripts—we receive, and on the quality, equity and promptness of the anonymous reviewers. We encourage our readers to help us to produce a first-rank journal.

Ricardo Guerrero
Editor-in-Chief