Pseudomonas aeruginosa reached an impasse. "We were missing two key proteins that we postulated were involved in turning P aeruginosa into an infectious agent," he recalls. By searching the Pseudomonas Genome Project website, a collaboration between the US Cystic Fibrosis Foundation, the University of Washington (Seattle, WA, USA), and the Seattle-based biopharmaceutical company, PathoGenesis, Schweizer found candidate genes for the proteins. Without the site, he says, "we would have taken at least 2 more years to get this far".

Traditionally, genetic sequences are not released until a project is completed, explains PathoGenesis’ Rick Garber. “By the time you’ve wrapped the last bow tie around it and waited for publication, you can be waiting 2–3 years. We’ve posted more than 85% of the P aeruginosa sequence in 4–5 months.” The result is that “labs around the world now have a powerful tool that could put their research way ahead of where they would be without it”, so hastening development of new therapies.

A more ambitious site with similar aims is the Cancer Genome Anatomy Project (CGAP) of the US National Cancer Institute. This contains regularly updated, searchable databases of DNA sequences, cDNA libraries, and clone arrays for lung, prostate, colon, breast, and other common cancers. Eventually, says molecular biologist Robert Strausberg, we will be able to describe a cell’s genetic profile at each stage of cancer development. This information could help identify precancerous cells and could help doctors decide the best treatment regimen for their patients based on tumour characteristics.

According to NCI’s International Cancer Information Center (ICIC), explains the clinical relevance of the genetic findings for health professionals, researchers, and the public, adds ICIC director Susan Hubbard: “The Internet and its graphical portion, the worldwide web, are transforming medical education and research in many ways, says Ramsey Badawi, coordinator of the World Congress on the Internet in Medicine (MEDNET 97, Brighton, UK; Nov 3–6). An increasingly important use, for example, is for patient recruitment for clinical trials and genetic studies, a process facilitated by online enrolment forms and e-mail.

Stephen Kennedy, a senior fellow in Oxford’s Nuffield Department of Obstetrics and Gynaecology, UK, has helped create such a site to enrol sister-pairs into OXEGENE, a study looking for endometriosis susceptibility genes. “It’s extraordinary how many women we can access this way”, says Kennedy. Within 6 months of the site’s inauguration, 127 eligible women around the world had volunteered for the study. By contrast, it took 4 years to recruit 395 volunteers with traditional methods such as advertisements and referral.

Margaret Pericak-Vance, director of the Center for Human Genetics at Duke University (Durham, NC, USA) says that it is the patients who set up by lay organizations, and contact us. It’s fantastic.” Similarly, Melvin Garrett of the US Glaucoma Research Foundation says his group’s site has “tremendously accelerated” enrolment for a study on primary open-angle glaucoma. And Karen London, founder of the US National Alliance for Autism Research, says the web has “revolutionised the way that a small, non-profit organisation can reach out to families, clinicians, and scientists”. Several of NAAR’s Board members first learned of the organisation through the website, which is helping to recruit families for a large US autism study.

The web is facilitating global communication on many medical fronts. Recently, a group of geneticists in Spain contacted Pericak-Vance through the Duke site to discuss collaborating. “We really hadn’t heard anything from Spanish researchers before”, she says. “I get e-mails from people in India, Pakistan, Japan—all over”, adds Hubbard. “We’re reaching patients and physicians in Europe, Asia, and third-world countries as never before, and getting the information out in a way that’s fast, cheap, and universal.”

“As primary-care physicians are increasingly called upon to get involved in the genetic aspects of medicine, information on the web will be used even more”, says Pericak-Vance. “The web is a tremendous resource and I think we’re just beginning to find out what it’s capable of doing for us.”

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