Hands-Free Colonoscopy

Colonoscopies may save lives, but they can be particularly unpleasant, entailing, as they do, a day of fasting and the ingestion of 4 liters of bad-tasting liquid to clear out the system, and then an invasive procedure that can be painful despite sedation.

But the virtual colonoscopy (VC) is now on the horizon. Thanks to a system developed by computer scientist Arie Kaufman of the State University of New York, Stony Brook, patients at about a dozen hospitals in the United States can at least enjoy some mashed potatoes before having their large intestines checked for polyps without being touched.

Patients confine themselves to soft, colorless foods, with a barium tracer, for 24 hours before the test. The procedure involves two 40-second, extremely high resolution computerized tomography scans. A computer cleans up the images, subtracting fluids and surrounding organs. It then divides the images into 1-mm-thick slices and reconstructs them into a 3D model of the colon.

Digital colon with 10-mm polyp.

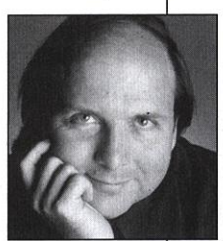
It is this model—and not your flesh-and-blood colon—that doctors then navigate. If they see a polyp, they can zoom in and take an "electronic biopsy" to see if it's malignant. Studies have shown that VC can detect polyps as small as 3 mm in diameter, says Kaufman, cofounder of Viatronix in Stony Brook, New York.

"The VC technique has a lot of potential benefits" over the usual optical colonoscopy, says Mariano Alcañiz, head of the Medical Image Computing Laboratory in Valencia, Spain. It's not only painless and cheaper, but it can see the whole surface of the colon, whereas Kaufman says optical colonoscopies miss about 20%.

Gastroenterologists, however, say there's one big drawback: The VC system can't remove polyps, so when it detects one, the patient has to come back for the old-style procedure.

Prizes for All Tenses

Another megaprize for bettering humankind, this time from Israel, was announced in New York City this month. It's actually three prizes, worth a total of $3 million, offered by a foundation set up by Dan David, chair of Photo-Me International, a global chain of photo booths. Administered by Tel Aviv University, the prizes honor contributions to "the three time dimensions in which humanity is immersed."


Hillis.

Sharing $1 million for their contributions to the future are three biologists: Sydney Brenner of the Molecular Sciences Institute in Berkeley, California; John Sulston of the Wellcome Trust Sanger Institute in Cambridge, U.K.; and geneticist Robert Waterston of Washington University in St. Louis.

Bagging another $1 million for enriching society in the present is engineer/author/inventor Daniel Hillis, chair of Applied Minds Inc. in Glendale, California, who pioneered the concept of parallel computing.

The Warburg Institute Library in London got the "past" award for "facilitating the study of Western civilization."

Streams Harbor Chemical Potpourri

Pills, lotions, and cleansers often make their way into streams via treated wastewater. Now scientists with the U.S. Geological Survey (USGS) have documented for the first time the low-key presence of such products in streams across the nation. The findings may spur debate over what some scientists regard as the next big unknown in environmental contamination: pharmaceuticals and personal care products (PPCPs).

In the USGS effort, begun in 1999, scientists collected samples from 139 streams in 30 states. They analyzed the samples for 95 organic chemicals from PPCPs including antibiotics, painkillers, perfumes, hormones, caffeine, insect repellent, sun lotion, blood thinners, antidepressants, and nicotine. Half the streams contained seven or more of the compounds, the team reports in the 15 March issue of *Environmental Science and Technology*. All concentrations were minuscule, and none violated government standards.

Nonetheless, scientists are concerned about cumulative effects. For example, 31 antibiotic and antibacterial compounds were identified, reflecting the increasing use of agents that some believe are encouraging the development of antibiotic-resistant organisms. And estrogen-type pollutants may already be having an impact, says aquatic toxicologist Daniel Schlenk of the University of California, Riverside, who says the reported amounts of 11 compounds linked to birth control and hormone supplements are high enough to change the sex of some kinds of fish.

Standing Up for DNA

British scientists and engineers have erected a 10-meter high model of the molecule of life in a shopping center. The DNA statue, hailed by *The Guinness Book of World Records* as the largest ever, is part of this month's National Science Week in the United Kingdom.

"DNA Day" is the brainchild of Graeme Jones, a chemist at Keele University. Thousands of tiny hands went into the making of the molecule. Children from local schools fashioned 15,850 atoms into bases, phosphates, and sugars and hooked these structures into base pairs using a commercially available molecule-modeling kit. Engineers from Daresbury Laboratory, near Oxford, took about 6 hours to put up the model.

Scientists stood by all last week to answer questions about it. The model, removed at the end of the week, is now unemployed. Would-be owners can contact Jones at g.r.jones@keele.ac.uk.

Crowds ogle DNA.

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