Hot at the Center

The ScienceScope item "Fusion milestone could become budget victim" (4 Aug., p. 623) describes some of the exciting new possibilities we are exploring in fusion energy research, but requires some clarification. It refers to the possibility of "ignition" in the Princeton Tokamak Fusion Test Reactor (TFTR), but we wish to emphasize that complete "ignition" (in which the external heating sources are turned off and the high temperature is maintained by the fusion reactions alone) is unlikely in the TFTR. However, our projection of recent results indicates a possibility that the fusion reactions could be so strong in the *central portion* of the plasma that they would dominate the plasma heating there, significantly increasing the central temperatures and further increasing the fusion power. This strong self-heating has some similarities to ignition, but at best it should be called "central ignition" (*1*) to distinguish it from full ignition. To avoid confusion, we would prefer to call this "strong central α-particle heating." If this can be achieved in the TFTR, it could ultimately lead to a less expensive fusion reactor design. The key to this possibility is the recently discovered enhanced reversed shear regime, described in an earlier Research News article by James Glanz, "Researchers build a secure plasma prison" (28 July, p. 478) and in a forthcoming paper (*2*).

Michael C. Zarnstorff
Princeton Plasma Physics Laboratory,
Post Office Box 451,
Princeton, NJ 08543, USA

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Kaposi's Sarcoma Findings

Jon Cohen reports (Research News, 20 June, p. 1847) that Yuan Chang described a Kaposi's sarcoma–associated herpesvirus (KSHV)–infected KS cell line. Actually, we and our collaborators have identified a lymphoblastoid cell line from an AIDS-associated non-Hodgkin's lymphoma (*1*), but not a KS cell line. We also have not found long-established KS cell lines to be KSHV infected, which is in agreement with the findings of Robert Gallo and others (*2*). In vitro KS cell lines appear to initially contain KSHV DNA sequences that are rapidly lost during in vitro passage (*3*), which mirrors our experiences in virus transmission to non-KS cell lines.

KS cell line studies have been central to hypotheses of Gallo and others about the origin of KS. However, it remains to be seen whether in vitro KS cell lines are an appropriate model for the in vivo tumor pathogenesis.

Patrick S. Moore
Yuan Chang
Department of Pathology,
College of Physicians and Surgeons of Columbia University,
630 West 168 Street,
New York, NY 10032, USA

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Tsunami Prediction

The article "Seismology: Faraway tsunami hints at a really big Northwest quake" by Richard Kerr (Research News, 17 Feb., p. 962) describes newly discovered coincidences that hint of a giant tsunami in the Cascadia Subduction Zone (CSZ) caused by an

earthquake of magnitude 9 on the Richter scale. A key "hint" was modeling results suggesting that a magnitude 9 event would generate a 2-meter-high tsunami in Japan, causing substantial and widespread damage and earning itself a place in Japanese records.

To my knowledge, no published tsunami modeling code exists that can quantitatively calculate inundation over transoceanic distances to within 2 meters. Modeling results from existing state-of-the-art Japanese and American codes have been shown to differ substantially and often by a factor of 10 from observed values (*1*, *2*), even for nearshore generation. More recent advances (*3*) have produced results differing by a factor of 4. It is widely believed (*2*, *3*, *4*) that the reason for this disparity is that existing transoceanic codes stop the wave propagation calculation far from the shoreline, usually at the 10 meters depth contour, to avoid either numerical artifacts associated with wave breaking or uncertainties in the available nearshore bathometry and topography data. The wave height at that location is then taken as the tsunami height. Whereas this practice has merit in that it qualitatively identifies run-up distribution patterns, it cannot calculate with any degree of confidence a 2-meter-high run-up height for a tsunami wave that was numerically propagated over a distance of more than 4000 kilometers.

Irrespective of the hydrodynamic modeling, the findings in Japan are consistent with a tsunami in 1700 originating from a giant CSZ event of a magnitude in the range inferred by the paleosedimentologic evidence in Puget Sound.

Costas E. Synolakis
Department of Civil Engineering,
University of Southern California,
Los Angeles, CA 90089–2531, USA

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Paving the Info Superhighway

Over the past several weeks, we have been collecting and archiving the World Wide Web locations (URLs) of high-quality medical information. As one source for our database, we used all of the Internet directories and indexes mentioned in Gary Taubes's article "Indexing the Internet" (Computers '95: Fluid Dynamics, 8 Sept., p. 1354). We looked for information that we, as practicing physicians, considered reliable and useful to both health-care providers and patients. In the end, we located many excellent medical resources on the Internet, but we had to discard most of the "medical" and "health" netsites because the information was sparse, unrelated to medicine, or from unproven sources.

For example, under the heading "Medicine" of one index we found the following mix: a Centers for Disease Control and Prevention site describing a useful free fax service that distributes detailed literature on AIDS topics, an emotional home page requesting donations for a 2-year-old girl who is in need of a heart transplant, a government location providing a lengthy policy statement on the carcinogenic potential of various chemicals, and a site covering nonmedical gay and lesbian issues.

Internet directories, indexes, and search engines are powerful tools for paving the information superhighway, but they are still in their infancy. The lack of human editing makes for an interesting (albeit bumpy) ride.

Robert S. Sikorski
Howard Hughes Medical Institute Fellow,
Division of Basic Sciences,