

LETTERS

Human Cancer Research

Letters from Harry Rubin (11 Mar., p. 1170) and Philippe Shubik (17 June, p. 1226) have expressed the belief that recent advances in molecular biology have not led to a deepened understanding of the nature of malignancy. I would go one step further and say that some cancer research may actually have set back our understanding because the data produced are not relevant to the human disease. The pressures of decreasing research funds, intense competition, and furthering careers often make publishing more important than meaningfulness of data. Thus it is not surprising that long-term "normal" and "transformed" cell lines are favored systems for study, as data can be quickly obtained. The cells grow rapidly, producing large numbers in a short period.

A fundamental disadvantage of using long-term cultures of embryonic rodent fibroblasts, such as 3T3 or 10T $\frac{1}{2}$, as normal cells may be that the cells do not age and are very different from the cells in our body. The altered patterns of DNA methylation now being reported in immortal cells (1) may reflect the conversion to immortality. These immortal cell lines are used in assays to test the transforming activity of carcinogens and oncogenes because the cells lack variability and are considered to have moved through all but the last step in the progression from normal to malignant. Progression, however, suggests that the cells have acquired features of the malignant phenotype. If this is true, why are the cells used as normal controls? On the other hand, if these cultures are partially transformed, should they not exhibit a high degree of variability, since much recent work (2) indicates that variability or heterogeneity is a fundamental characteristic of the malignant phenotype.

Even human tumor cells are not immortal when taken from the patient and put in culture. Only after a period of adaptation and selection does an immortal clone sometimes arise from a primary cell culture. The relationship between these immortal tumor cell lines and the original tumor cells is in my opinion distant. To my knowledge, none of the human tumor cell lines derived from adenocarcinomas retain the glandular organization characteristic of adenocarcinomas or the normal cell types from which they arose. Furthermore, human tumors do not appear to exhibit the alteration of a cellular oncogene (3) that has been demonstrated in long-term carcino-

ma cell lines (4). Since a basic concept in biology is that structure and function are related, we can conclude that human tumor cell lines do not function like human tumors. Perhaps cancer researchers who experiment with long-term cultures should pause for the purpose of imaginative thought so that appropriate experimental systems for studying human cancer can be developed.

GERALD B. DERMER

Department of Pathology, University of North Carolina School of Medicine, Chapel Hill 27514

References

1. V. L. Wilson and P. A. Jones, *Science* **220**, 1055 (1983).
2. G. Poste and I. J. Fidler, *Nature (London)* **283**, 139 (1980).
3. A. P. Feinberg, B. Vogelstein, M. J. Droller, S. B. Baylin, B. D. Welkin *Science* **220**, 1175 (1983).
4. C. J. Tabin *et al.*, *Nature (London)* **300**, 143 (1982); E. P. Reddy, R. K. Reynolds, E. Santos, M. Barbacid, *ibid.*, p. 149.

Potassium Iodide: Policy in New York

Earlier correspondence from Rosalyn S. Yalow (23 July 1982, p. 295; 19 Nov. 1982, p. 742) and Frank von Hippel (1 Oct. 1982, p. 6; 17 Dec. 1982, p. 1174) was concerned with the overall effectiveness of potassium iodide (KI) for blocking the thyroid glands of populations potentially exposed to radioiodine that might be released in a nuclear power plant accident. These letters referred to a statement on the subject approved by the Committee on Public Health of the New York Academy of Medicine on 2 March 1981 (1). Because the decision about whether to distribute KI to a large population distant from a power reactor site has public health implications, we are constrained to comment.

In early 1980, the Committee on Public Health decided to review a recommendation that originated within the New York City Department of Health for expenditure of roughly \$13 million (approximately 10 percent of the total annual budget of the department) for the purchase of KI. At that time there was a widely held view that, in the event of an accident leading to the escape of radioactivity from the containment vessel of a nuclear power reactor, radioactive iodine would be a major health hazard because of its adverse effect on the thyroid.

We had been made aware by the health physicists on our expert panel that, of the approximately 64 megacuries of iodine-131 in the Three Mile Island (TMI)-2 reactor core, only about 15 cu-

ries (0.00002 percent of the total) had escaped from the containment vessel by an indirect pathway. More important, the first postaccident sampling performed about 24 hours after the damage to the reactor fuel indicated that only about 4300 curies were present in the air within the containment vessel despite the release of 22×10^6 curies from the damaged fuel to the reactor coolant water. Andrew Hull of Brookhaven National Laboratories, a member of our review panel, had discussed the implications of these observations at a meeting of the American Nuclear Society on 10 June 1980 (2). The subsequently published Electric Power Research Institute (EPRI) report (3) was referenced by us as another source. It reviewed previously unpublished operational factors in a reactor that serve to minimize escape of iodine to the environment. *The Report of the President's Commission on the Accident at Three Mile Island* (4) provided similar information on the release of radioactive iodine. Von Hippel incorrectly implies in his letter of 17 December that the Committee on Public Health "relied heavily on a statement by [EPRI] that very little radioactive iodine would be released in any future nuclear reactor accidents."

The Committee on Public Health was not alone in paying heed to the EPRI report. The Nuclear Regulatory Commission has stated that information from EPRI, including the report of Levenson and Rahn (3), together with a letter from three scientists from Oak Ridge National Laboratory and Los Alamos Scientific Laboratory, were key factors in the development of the review to which von Hippel refers and which was summarized in NUREG 0772 (5).

NUREG 0772 supports the conclusion that little of the released radioiodine from the fuel during an accident is likely to become airborne when the containment vessel is intact and water is present. However, the authors emphasize the low-probability, high-risk accident sequences in which there is a major release from the fuel during postulated meltdown and a subsequent rupture of the containment vessel. We do not deny the seriousness of such an accident, whatever the probability. However, we note the statement in NUREG 0772 that, in such an event, "it is important to emphasize that iodine is not the sole radionuclide of importance in nuclear accident analyses. . . . Radioactive iodine contributes roughly one-half of the dose resulting in early fatalities and illnesses, but only about five percent of the dose resulting in latent cancers" (5, p.

BIOTECHNOLOGY



Source of Excellence

HAS THE ANSWER TO YOUR RESEARCH NEEDS.

Alfacell introduces tomorrow's biological products today.

Alfacell, through consistency and innovation, has the capability to customize most of its biological and biomedical products to meet your requirements.

Service is first with Alfacell. 24 hour delivery and strict quality control insure stability and purity of products worldwide. Alfacell breeds and maintains the majority of its laboratory animals in its own environmentally controlled facilities.

Alfacell offers products in the following major categories:

Cell Biology
Complement
Immunology
Hybridoma/Monoclonal Antibodies
Blood Products
Tissues and Organs

Custom Services Available

Please rush Alfacell free 1983 Catalog. For additional information, please call our Customer Service Department collect.

Name/Title: _____

Institution: _____

Department: _____

Address: _____

Telephone: _____



225 Belleville Avenue, Bloomfield,
N.J. 07003
(201) 748-8082 or 748-8083

Circle RS# 80 on RS Card

1.5, Sect. 1.1.3). "Early fatalities" are not the result of exposure of the thyroid to radioiodine and hence would not be prevented by ingestion of KI. The report also states that "the radioiodine noble gases are particularly difficult to contain in an accident." In accidents where chemically reactive fission products including iodine-131 are present, "the noble gases will be the principal form of radionuclides released" (5, p. 2.7).

These brief excerpts, the importance of which are not touched upon by von Hippel, offer support for our statement opposing storage and distribution of KI in New York City at the time of a reactor accident. Furthermore, attempts to distribute KI at the time of an accident would bring massive numbers of people into the streets with the resultant risk of increased exposure to various radioactive substances. This and our other arguments against the distribution of KI during an accident are not mentioned by von Hippel. They were compelling points to the Committee on Public Health. We believe that the same arguments hold for other major population centers not immediately in or adjacent to nuclear power reactors. We have not taken a position on the use of KI for workers in the plant, for individuals living near the plant, or for those who in their official or medical capacities may need to stay in or near potentially dangerous areas.

It has come to our attention that the Federal Emergency Management Agency (FEMA), which earlier favored and planned to purchase and distribute KI to the states, will not do so despite a congressional appropriation for this purpose. FEMA has decided that policies on stockpiling and use of the drug ought to be made at the state and local level (6).

As part of its continuing review of this problem, a panel discussed the use of KI at a Symposium on the Health Aspects of Nuclear Power Plant Incidents at the New York Academy of Medicine on 7 and 8 April 1983 (7).

NORMAN SIMON
MAURICE E. SHILS

Committee on Public Health,
New York Academy of Medicine,
2 East 103 Street,
New York 10029

References

1. Committee on Public Health, New York Academy of Medicine, *Bull. N.Y. Acad. Med.* 57, 395 (1981).
2. A. P. Hull, *A Consideration of the Need for Evacuation to Public Safety at Three Mile Island*, paper presented at a meeting of the American Nuclear Society, Las Vegas, Nev., 10 June 1980.
3. M. Levenson and F. Rahn, *Realistic Estimates of the Consequences of Nuclear Accidents* (Electric Power Research Institute, Palo Alto, Calif., 1980).
4. *Report of the President's Commission on the Accident at Three Mile Island* (Pergamon, New York, 1979), p. 31.
5. *Technical Bases for Estimating Fission Products Behavior During LWR Accidents* (NUREG 0772, Nuclear Regulatory Commission, Washington, D.C., 1981).
6. R. Krimm, "Potassium iodide stockpiling," paper presented at a meeting of the Atomic Industrial Forum on Radiation Issues for the Nuclear Industry, New Orleans, La., 6 October 1982.
7. *Proceedings of the Symposium on the Health Aspects of Nuclear Power Plant Incidents* (New York Academy of Medicine, New York, in press).

Meeting Attendance

The *Chronicle of Higher Education* reports (8 June, p. 3) that, because of poor attendance at the 149th annual meeting of the AAAS in Detroit, our association stands to lose close to \$300,000. The article cites snowstorms and vacation plans as reasons for the meager attendance.

The insufficient support given to state university professors for travel to such meetings is another reason for the lack of attendance. This past year many professors were kept from attending scientific meetings because funds were "nonexistent" or "frozen" for such activities. Many beneficial contributions returned to state and country have their genesis at professional meetings of this nature.

It would be a good idea for those professors and AAAS members who were not financially supported to attend scientific meetings to write their legislators explaining the importance of increased support for such activities.

HAL J. DANIEL III
Departments of Speech, Language and Auditory Pathology and Anthropology, East Carolina University, Greenville, North Carolina 27834

It is difficult to judge the overall economics of the AAAS annual meeting, as it is construed to be a mandated member activity (similar to the publication of *Science*), and therefore the cost is partially defrayed by member dues. However, the "additional loss" because of the poor attendance in Detroit was significantly less than \$100,000 (exact figures are not known, as all the bills have not yet been paid).

ARTHUR HERSCHMAN
Meetings and Publications Center, AAAS, 1101 Vermont Avenue, NW, Washington, D.C. 20005

Erratum: In the article "the 0.001557806449023-Second Pulsar" by M. Mitchell Waldrop (*Research News*, 18 Feb., p. 831), the last sentence of the last full paragraph in the second column should have read: "Within a few weeks he was in Aricebo himself, and on 14 November he verified pulses at an astonishing 642 hertz, equivalent to a period of 1.558 milliseconds."