CORRESPONDENCE

ALGAL ALARM

To the editor:

I read Arthur Klausner's article on algaculture in your November 1986 issue and was happy to see coverage finally being given to this important new field. But I was astounded to see that you neglected to mention an individual responsible for sparking much of the current interest. Christopher Hills has been a major contributor over the past 20 years in pioneering mass production of microalgae for feeding hungry people, for the nutritional products industry, and for pharmaceutical application.

Hills' companies—Biogenics, Microalgae International, Agriculture Research Co., Light Force, and Aquaculture Nutrition Products Co.—have several algae research and production facilities worldwide and have sold over $100-million worth of *Spirulina*-based products over the last seven years. Hills' new research company, Phycotene Inc., is on the leading edge of algal biotechnology and has been sponsoring research at Harvard University since 1985, including studies on using proprietary algae extracts for immune system enhancement and for cancer prevention and regression. These extracts, which contain 15 natural carotenes in addition to beta-carotene, were up to 20 times more effective than beta-carotene alone in destroying cancer cells without harm to healthy, normal cells. They also induced macrophages to produce high levels of tumor necrosis factor.

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SOUR LEMONS: ALTMAN'S COMPLAINT

To the editor:

The January 1987 issue of *Bio/Technology* published a nice photograph showing juice-filled sacs, and stated "Lemon vesicles grown in tissue culture for the *first* time." I agree that the culture of citrus juice vesicles is, indeed, a novel approach to the biotechnological utilization of *in vitro* organ culture, and that it will permit scientists to perform several meaningful experiments. I would like to add, however, that this idea was conceived initially as far back as six years ago in our laboratory at the department of horticulture of the Hebrew University (Jerusalem).

In 1981 and 1982 we published a detailed description of lemon juice vesicles cultured *in vitro* (A. Altman et al., *Physiol. Plant.* **53:**295–300, 1981, and *Plant Physiol.* **69:**1–6, 1982). In addition to several photographs (which are very similar to the one shown in *Bio/Technology*), the papers contained a detailed procedure for the *in vitro* culture of juice vesicles, and they presented the results of studies on the effect of plant growth regulators on several physiological and biochemical parameters of lemon juice vesicles. Experiments currently in progress at the Otto Warburg Center for Biotechnology in Agricultures (Hebrew University, Rehovot) are aimed at further elucidating the biotechnological aspects of citrus juice vesicle culture.

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LEMON-AID: TISSERAT RESPONDS

To the editor:

Culture of citrus juice vesicles has been conducted by numerous investigators since the 1950s[1,2], and cultures derived from juice vesicle tissues have been used to study metabolism and differentiation[3,4,5,6,7]. While Dr. Altman was the first to report juice vesicle growth in culture, we believe that we are the first to achieve vesicle growth with minimal callusing (see photo in *Bio/Technology* **5:**10, Jan. '87). To be more specific, we have routinely obtained growth (for up to six months in culture) in which the preponderance of vesicles are callus-free, with only occasional vesicles showing small areas of callus. Callus-free vesicles are important for model studies that mimic fruit-grown vesicles.

Also, we use different media, culture techniques, and growth environments than did Altman. Others using similar media to Altman's report callus production from cultured juice vesicles[6,7,8,9,10,11,12]. Likewise, much callus production is evident in Altman's published photos.

Unfortunately, brief news stories such as the one in question do not allow for these kinds of details and distinctions. We assure Dr. Altman that his two papers will be fully referenced and discussed in our forthcoming technical papers.

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