INTERNATIONAL CONGRESS OF MICROBIOLOGY

RECYCLING BREWER'S YEAST TO MAKE DRUGS

MANCHESTER, U.K.—Spent brewer's yeast may not be that spent after all. Delta Biotechnology Ltd. plans to produce saleable proteins such as human serum albumin (HSA) by exploiting yeast after it has performed its initial task of generating ethanol for the brewing industry.

As Delta's R&D director, Peter Senior, said during the 14th International Congress of Microbiology, elimination of the capital and revenue cost needed to support the production of biomass gives Delta's strategy a considerable edge over more conventional approaches. The company, which maintains close ties with MIT, Oxford, and Cambridge, employs over 30 researchers in Nottingham. Delta arose from a collaboration between Bass plc, which claims to be Europe's leading brewery in terms of R&D, and Cavendish Technology Partnerships Ltd., specialists in recombinant DNA blood products. Bass is the majority shareholder, with the U.S.'s Stroh Brewery Co. as a significant minority shareholder.

The patented Delta process, which will be limited initially to totally inert proteins, has no influence on the basic brewing operations or the quality of the beer. The idea is to modify *Saccharomyces cerevisiae* genetically so that genes coding for desirable proteins remain silent until they are triggered and expressed in a process separate from brewing. Delta senior scientist Ted Hinchcliffe described the two key elements developed for the biosynthesis of HSA. These are a plasmid containing yeast genes and the HSA gene alongside a promoter gene that is triggered only by galactose. Inserted into *S. cerevisiae*, the plasmid remains dormant during brewing because wort does not contain this particular sugar. Once the yeast has completed its primary work and has been removed from the brewery, however, addition of galactose activates the HSA gene and the yeast then begins its second useful life.

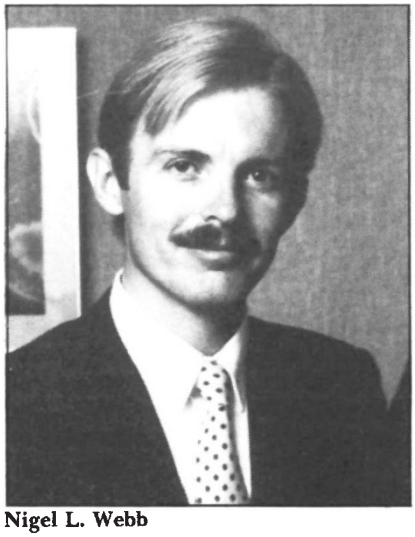
Both Hinchcliffe and Senior emphasize the convenience and safety features of their method, which they say will be applied to a variety of therapeutic proteins and modified animal feed products over the coming years. Brewers have vast experience in cultivating yeast, the genetics of which are well understood. And, in contrast to *Escherichia coli*, there is little or no evidence of human toxicity. "HSA produced by our process may be guaranteed AIDS- and hepatitis-free and will be of higher quality than the current blood-derived product," said Senior. "Certain enzymes which may be used in food processing and proteins with potential applications in specialist materials science sectors may also be made by this highly cost-effective technique."

—Bernard Dixon

BUSINESS STRATEGY

DAMON BIOTECH: DELETING AND REARRANGING

NEEDHAM HEIGHTS, Mass.—As songwriter Jerry Lee Lewis put it, "There's a whole lotta shakin' going on." At Damon Biotech, Nigel L. Webb has resigned his posts as vice chairman and director of the company and its facilities. Vivotech, the joint venture between Damon Biotech and



Nigel L. Webb

Connaught Laboratories (Ontario, Canada), no longer exists. And Biotherapy Systems (BTS, Palo Alto, CA), a company in which Damon had an 80 percent interest, has merged with a new biotech firm, IDEC (La Jolla, CA).

Why? According to Marcia Amsterdam Kean, Damon Biotech's vice president for corporate communications, this is all part of the business strategy of the company's new president and chief operating officer (COO), Robert P. Schneider (who is also the president and COO of Damon Biotech's parent, Damon Corp.).

Schneider took over the reins of Damon Biotech in May 1986 from Webb, who had led the company since 1983. Webb then became vice chairman, responsible for overseas operations and business development. Kean explains that, since then, the establishment of exclusive partnerships with other firms has become a *major* priority of the company and a full-time job—one that Webb will handle for the remainder of the year. Webb confirms that he is technically affiliated with the company through the end of this year—what he plans to do after that remains to be seen.

In fact, Damon Biotech has already made strides towards its partnership goal. Webb has just completed negotiations with a Japanese pharmaceutical company, which Webb says has a "record in cardiovascular products," for the manufacturing and marketing of tissue plasminogen activator (t-PA). This, says Webb, is Damon Biotech's first move into proprietary products. He adds that Damon Biotech is also actively negotiating with other companies in the United States and Europe, again for t-PA. And Kean says that the company "is delighted at the way negotiations are going, particularly in the Far East." Damon Biotech will manufacture all the t-PA; either in its Needham Heights facility or in its as-yet-to-be-

Alison Taunton-Rigby

completed one in Scotland. The company's t-PA has some differences from others under development: it is a single-chain form of the molecule produced by a transformed mouse myeloma cell. The technique takes advantage of the company's propri-