time, the natural PDE genes found in yeast with human PDEs. Each yeast strain so constructed ostensibly could be used as a single, specific screen for identifying pharmaceutical compounds that can act as individual PDE inhbitors.

But even the best-tailored biotech business plans haven't raised $33 million. What distinguishes Icos is that PaineWebber (New York) joined with the founders to raise the initial financing. Using its retail broker network, PaineWebber was able to sell $28 million in units of Icos stock to over 400 individual investors. (The more usual venture capital route, on the other hand, would have netted maybe $8–10 million from a handful of firms.) The icing on the cake came after that initial round, when William Gates, the chairman of Seattle-based Microsoft, contacted PaineWebber about buying a ten-percent stake in the company. With the value of founders' stock added to the $28 million raised in the initial placement, Gates' stake—along with a seat on the board of directors (his only directorship) and the option to maintain his ten-percent ownership of the company in the future—cost him $5 million. All told, Icos' valuation has hit $50 million. And the Icos board includes Walter Wriston and Frank Cary, former chairmen of Citibank and IBM, respectively. All board members, with the exception of Gates, have tie-ins with pharmaceutical companies.

Nowinski believes Icos has "short-cutted its financing and management building;" in effect going beyond the start-up phase at its inception. "Genetic Systems started on $1 million, as did Immunex. It took each of those companies three or four years to reach the $33 million level of funding." As well, he adds, "Those companies initially were constantly raising money. That took much of the senior executives' time." And because its scientists come together as existing teams, Nowinski believes Icos has more organization in place than would a start-up.

The start-up characterization may not really matter, but the Icos fundraising mechanism may prove quite telling as a barometer for future biotech financings. PaineWebber first managing director Stelios Papadopoulos notes that "for a very long time, people have been pointing to the lack of a mezzanine market"—the dearth of later-stage private funding for biotech companies (*Bio/Technology* **7**:1224, Dec. '89). "This *is* the mezzanine market," says Papadopoulos emphatically. "PaineWebber plans to repeat this type of deal." **—Mark Ratner**

DELIBERATE RELEASE REGULATIONS

SCOPE OVERSIGHT 'PRINCIPLES'

WASHINGTON, D.C.—At long last, the federal government has issued a draft notice outlining how key agencies will attempt to oversee particular biotechnology issues. The document, which is being published in the Federal Register for public comment, describes "principles for the scope of oversight for the planned introduction into the environment of organisms with modified hereditary traits." Although the principles are being criticized for being too "vague and philosophical," and because they throw important decision-making back to individual agencies, their acceptance could help break the logjam retarding the development and implementation of federal regulatory policies for biotechnology.

The newly proposed principles, which stray in style and content from the "scope definition" under consideration earlier this year (*Bio/Technology* **8**:187, Mar. '90), are a product of months of behind-the-scenes maneuvering among officials from federal agencies. Although the subject matter described within the draft principles is esoteric, the acrimonious debate that stalled their release caught the attention of high officials within the Bush Administration. Ultimately, the Vice President's Competitiveness Council participated in the scope document deliberations—thus involving policy-making officials from federal departments, including Justice and Commerce, who ordinarily spend little time on, and bring little expertise to, such scientific issues.

The scope document is supposed to help federal regulatory agencies develop consistent policies "without unduly inhibiting" deliberate release experiments. The proposed new principles potentially extend regulatory jurisdiction to include "organisms resulting from any process or technique." According to the document, this choice of language is intended to avoid singling out any particular method (such as recombinant DNA techniques) and to correct any "misconception" that one method is "inherently of greater risk" than other means of genetically altering living organisms. The document acknowledges that agency officials may sometimes need to consider the means by which organisms were genetically modified when evaluating their safety for release into the environment.

Oversight of planned introductions is to be reserved for experiments where "the risk posed by the introduction indicates that oversight is necessary." The draft principles do not, however, "dictate precisely what information on risk must be considered." Instead, they "set forth general criteria for assisting agencies in developing possible categories...for exclusion from oversight," leaving much of the implementation of the principles "within the discretion of individual agencies." Many traits of the organisms and of the environments into which they may be placed are mentioned as "relevant risk factors."

The document also suggests six "potential exclusion categories" of organisms that may safely be tested in the environment without extensive regulatory assessments, including:

- Plants and animals that result from natural reproduction or by traditional breeding techniques;
- Microorganisms modified solely through chemical or physical mutagenesis, by transduction, transformation, or conjugation, or by plasmid loss or spontaneous deletion;
- Vascular plants regenerated from tissue culture, including somaclonal variants, embryo rescue, protoplast fusion, or treatments that cause changes in chromosomal number;
- Organisms that have been modified by non-coding, non-expressed nucleotide sequences that cause no phenotypic or physiological changes;
- Organisms resulting from deletions, rearrangements and amplifications, within a single genome, including extrachromosomal elements; and
- Organisms with new phenotypic traits conferring no greater risk to the target environment than the parental strain, which is considered safe.

Although most of the proposed exclusion categories represent revised items from early this year, the last of the six is brand new. According to insiders, it signifies a bold move to exempt any and all genetic methods, including recombinant DNA techniques, from regulatory scrutiny when the organisms they produce are devoid of risk to the environment—an issue that recently has caused problems for both researchers and regulators (*Bio/Technology* **8**:598, July '90). As with all these suggestions, however, interpretation and acceptance of this provision will reside with individual agencies.

Publication of the scope draft principles is expected to speed issuance of proposed rules and guidelines from the Environmental Protection Agency (EPA) and the U.S. Department of Agriculture (USDA).

—Jeffrey L. Fox