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lower than 0.5–1%, but that would fail to deliver the differentiation between products that consumers seek. “At the end of the day,” he says, “you have to live in the real world.”

There are still a number of administrative loose ends to tie up. Nestlé’s Toet points out that the proposal stops short of demanding validation of the tests used to detect the GM ingredients. “Although there are a number of methods that can detect this level of protein

or DNA, there is no validated test that is the approved method for performing the analysis. Thus it is still not completely clear precisely how [the Commission’s proposals] are going to work.”

The new threshold does not allow manufacturers or retailers to claim that their products are “GMO-free”: officials at the EC are looking into this separately. The model for that could be the system that is already in place in

Germany. There the use of enzymes produced in genetically engineered organisms is banned; GMO-free products cannot contain any ingredient from animals that are themselves genetically modified or that have had any contact with genetic modification through their feed or veterinary medicines. The system is only enforceable through a system of stringently maintained documentation.

John Hodgson

Spanish R&D budget boosts biotechnology

The Spanish government intends to develop an internationally competitive biotechnology industry by significantly increasing its R&D budget for biotechnology and other innovative technologies for 2000–2003. The government also plans to implement an innovation law in 2000 aimed at encouraging bioentrepreneurship. Although an increase in R&D funding is welcome and may eventually have an impact on competitive research in biotechnology companies, other government action is clearly inadequate, and observers think that participation of established industry at the regional level is key to growth of the sector.

In November, the Interministerial Commission on Science and Technology proposed an overall R&D budget of Ptas508,000 million (\$3,175 million)—a 10% increase over 1999’s Ptas460,000 million (\$2,874 million). Although a breakdown of the budget is not yet available, “there will be an increase of 20% for biotechnology compared to last year,” says Gonzalo Leon, deputy director of the Office of Science and Technology.

The quality of Spanish research is high, according to Manuel Zahera, director of development at Cotec, the independent trade organization for technology development. Research has traditionally been strongest in agrifood, pharmaceuticals, and more recently, diagnostics. “American venture capitalists will only invest in Spain if the science is outstanding, since we are competing at the international level,” says Carlos Martinez, head of the immunology and oncology department at the National Center of Biotechnology.

The total budget will be increased by 10% each year, with the aim that R&D will account for 1.29% of the gross domestic product by 2003. In 1998, R&D accounted for only 0.9%, compared to 2.24%, 1.87%, and 2.71% in France, the UK, and the US, respectively. Although this means that Spain cannot compete in all spheres, “By the very nature of biotechnology, there are opportu-

nities for development through niche markets,” says Emilio Muñoz, director of Gabinete de Biotecnología, the government cabinet for biotechnology.

However, despite Spain’s research strength, the number of new biotechnology companies in the country is low, says Juan Martin, director of INBIOTEC (Instituto de Biotecnología), the institute of biotechnology at the University of Leon science park. There are about 200 start-ups in Germany, 130 in France, but only 30 in Spain, many of which are subsidiaries of multinational companies.

It is likely that nurturing of new biotechnology companies will fall to Spain’s regional governments, which are already geared toward working with local industry.

“We [Spain] are 15 to 20 years behind for historical reasons and it is difficult to bridge the gap, especially because, in the past, development has never been technology based,” says Muñoz. The most striking problem, he says, is that the lack of start-ups has meant that Spain has not evolved broad technology expertise.

But attempts to address the start-up deficit don’t appear to go far enough. The government plans to implement a new Law for Industrial Innovation next year to “integrate public research and industry,” says the Office of Science and Technology’s Leon. For the first time, all small and medium enterprises (SMEs) will receive a 15% tax rebate on innovative projects carried out in collaboration with research bodies. Other incentives include a 10% rebate on research personnel, as well as recoupable production, patenting, and certification costs.

However, the rebates are well below both the 60% rebate that large companies in Spain can claim and those in competing countries that have a stronger industrial base—French innovative SMEs, for instance, benefit from

a 50% R&D rebate (*Nat. Biotechnol.*, 17, 1055, 1999).

In addition, not enough is being done to encourage industry participation. Less than 10% of research funding currently comes from industry, according to the grant agency Comisión Interministerial de Ciencia y Tecnología, and biotechnology collaborations between industrial sectors and public research centers are rare. “It is only possible to reach [the target of] 1.3% of gross interior product spent on R&D by 2003 if the private sector gets involved,” says Xavier Testar from the Technology Transfer Office in Barcelona.

Under the current grant-based system, companies have to put forward money before receiving reimbursement from the government. Increasing the amount of R&D budget money that goes to SMEs is a step in the right direction for creating new mechanisms for seed and venture capital, but “we need private funding to add to government funding to help start-up companies,” says Felipe Romera, director of the Andalucía Technology Park in Málaga.

“Only 10% of the money needed by companies is currently available,” says Theofiló Díez-Caballero, ASEBIO member and scientific director of Biosensores SL (Barcelona). ASEBIO (Asociación Española de Bioempresas), the Spanish BioIndustry Association, was created in October with the goal of promoting the creation of start-ups from the public R&D system and bioincubators at the regional level.

Thus it is likely that nurturing of new biotechnology companies will fall to Spain’s regional governments, which are already geared toward working with local industry. These decentralized autonomous regions, such as Madrid and Catalonia, have their own budgets—varying between Ptas1,000 million (\$6 million) and 12,000 million (\$75 million)—and have already started creating technology parks and bioincubators. Joan Bellavista, deputy director at the Barcelona Science Park, says, “Our idea is to create 10 new biotechnology companies in the next four years.”

Sabine Louët

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