Spanish watchdog sees way ahead for stem-cell research

[BARCELONA] **At a time when public debate in Spain appears to be moving in favour of therapeutic cloning, the country's National Commission on Assisted Reproduction has come out in support of the use of non-embryonic stem cells as a potential source of human cell cultures, tissues and organs.**

Its comments are included in a series of recommendations to the government on issues related to human reproduction, such as the preservation of frozen embryos, sperm and oocytes, and the donation of embryos.

The commission is headed by Enrique Castellón, under-secretary in the Ministry of Health, and is made up of 22 specialists from ministries and scientific societies, medical organizations and lawyers. In its first annual report, it emphasizes that both ethical and legal aspects of the concept of "embryo status" provide greater support to stem-cell research than to other techniques for producing cloned embryos for research.

According to the commission, general principles about considering human beings as an end rather than a means — as well as the right to be genetically unique and not genetically programmed — constitute a serious ethical objection against reproductive cloning by nuclear transfer of somatic cells.

At present, there are no well-established research teams engaged in cloning experiments in Spain, says the report, although this situation may change soon as the centres improve their technological capabilities.

The commission emphasizes that human reproductive cloning is forbidden by law in Spain, and proposes a hardening of the penal code, which it says could be misinterpreted in its present form, to penalize such activities.

Reproductive cloning by splitting embryos has only limited potential application, and would also be problematic from an ethical point of view, says the report.

The commission acknowledges the potential advantages of using non-reproductive human cloning to obtain tissues and organs for transplantation, but argues that the "problem" of the "embryo status" discourages the development of such techniques.

As a result, says the commission, "embryonic cells must be obtained by nucleus transfer. And this means the creation of a human embryo, even though it may have a few days of life, and its subsequent destruction in the lab to obtain cell cultures."

Spain's Catholic Church has not issued any reaction to the report, but it is opposed to any form of artificial manipulation of embryos, on the grounds that "the human being has the right to be a product of the natural genetic randomization". Xavier Bosch

Private nuclear waste plan faces critics in Australia

[SYDNEY] A cat-and-mouse game that has been taking place since 1997 over an ambitious private plan for an international repository for high-level nuclear waste in Australia has at last become the subject of public debate.

Plans for such a repository drawn up by Pangea Resources Australia were revealed last December by Friends of the Earth in London. Surrounded by accusations of secrecy and back-door dealings, the company's proposal has provoked considerable public opposition.

Pangea's leaders have now begun to talk publicly about the plan for the first time. US chairman David Pentz outlined the plans for the waste, which comes from spent fuel and dismantled weapons, at a conference in Tucson, Arizona, last month. He said that Australia had been selected as the only location to take such waste following studies of "four regions within several nations".

Pentz said that a "very rigorous set of siting criteria" favours the vast, 300–800-million-year-old sedimentary basins spanning the states of Western and South Australia, the remnants of the 'supercontinent' of Pangea.

A network of chambers 500 metres underground and covering 20 square kilometres would house sealed containers in which radioactivity could subside to natural levels over 250,000 years, according to the plan.

But some Australian geologists back contentions by environmentalists that Pangea's prediction of geological stability is unrealistic.

Pentz linked Pangea's proposal to future applications of 'Synroc', an Australian process for immobilizing radioactive material within a synthetic rock formed under high pressures and temperatures. He said he saw this as an "integral part" of preventing the proliferation of nuclear weapons.

Pangea was formed by Golder Associates, a Canadian company now based in Seattle, Washington State, and is backed by two organizations active in nuclear waste disposal, British Nuclear Fuels and Nagra of Switzerland. The company estimates the cost of constructing the site and providing transport infrastructure as US$6 billion, and annual operating costs as $450 million.

Pangea predicts that global production of nuclear waste will grow to more than 450,000 tonnes by 2020. It would build dedicated ships and railways to import 2,000 tonnes each year, up to a maximum of 75,000 tonnes.

Although it has no nuclear power stations of its own, Australia is a significant player in the nuclear industry, as it provides about one-fifth of the world's supply of uranium. But Nick Minchin, the industry, science and resources minister, says user nations should be responsible for storing their own waste.

CORBIS/HOWARD DAVIES

Rough road ahead: federal ministers oppose plan to bury nuclear waste in Australia's outback.

Minchin has written to Jim Voss, Pangea's senior representative in Australia, emphasizing that the government's policy of not accepting nuclear waste from other countries is "absolute and will not be changed". Minchin said the government "has no intention of considering Pangea's proposal".

Minchin says Australia is only committed to dealing with waste from its sole 'research reactor' at Lucas Heights, Sydney, and from its forthcoming replacement, which was cleared on environmental grounds by environment minister Robert Hill last month (see *Nature* **398,** 454; 1999).

But Australia has yet to decide where to store the reactor's waste, accumulated over 40 years in 1,600 fuel rods. Hill has stipulated that the new reactor can proceed only when a comprehensive waste plan is approved.

Charles McCombie, a geologist and Pangea's head of science, technology and engineering, told a uranium conference in Darwin that the company had submitted a "summary project" to the federal government in February. He described deep underground disposal as a "necessary and a responsible waste management course" which he judges to be "technically feasible".

According to McCombie, the submission contains incentives of "significant economic stimulation in Australia of the order of one per cent of the gross national product, and long term employment benefits, creating as many as 70,000 jobs".

McCombie accepts that "public opposition to specific repository siting proposals is high". But he seems undeterred, and forecasts a long campaign.

Brian Anderson, president of the Australian Academy of Science, said on Australian television this week that he personally supports the Pangea proposal, and sits on its scientific review board. Peter Pockley