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Children stand to gain from changes to stem cell stance

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CHILDREN with debilitating illnesses such as cystic fibrosis, leukaemia and juvenile diabetes are expected to be among the first patients to benefit from likely changes to Australia's embryonic stem cell research laws.

Australia's leading scientists said work on human embryo cloning was likely to begin within months of any new federal legislation. But they also warned that therapeutic cloning — in which healthy tissues grown from a patient's own DNA are transplanted back into the body — could be a decade away.

"Of course, there will be enormous pressure to move faster than that," Australian of the Year Professor Ian Frazer said. "But even if you come up with something that works beautifully in early-stage human clinical trials, translating it to the point where it's safe and acceptable ... it's sort of a 10-year exercise."

Only nine licences for embryonic stem cell research have been granted since the first piece of legislation was passed in 2002. Current laws allow scientists to experiment with excess IVF embryos, but don't allow for human eggs to be donated then used to create an embryo.

Professor Frazer — whose cervical cancer vaccine took years to develop — said researchers would take a similarly cautious approach this time.

"It won't be a case of open season," he said. "Scientists don't go and use the technology unless they truly believe it will help them to solve a problem."

Professor Frazer pinpointed diabetes as one disease that might benefit more quickly from the patient-specific cloning technique, also known as somatic cell nuclear transfer (SCNT).

A team from Monash University has already pioneered a way to coax mouse stem cells to become insulin-secreting pancreas cells. Professor Alan Trounson, who led the research, said his team was ready to begin similar trials in people with juvenile, or type 1, diabetes.

"The anticipation is that we should be able to start making stem cell lines from cells donated by these patients by next year," Professor Trounson said. "It will be a priority for us ... to take cells from patients with type 1 diabetes and see what we can do."

"The other areas in which we have some expertise are motor neurone disease and multiple sclerosis. Those will be the three targets that we'll adopt in the first phase."



Professor Stephen Livesey opens a liquid nitrogen storage vessel containing frozen stem cells at minus 180 degrees.

Photo: *John Donegan*

Professor Stephen Livesey, the chief executive of the Australian Stem Cell Centre, said the main focus of early research would be on modelling the progression of disease. Using the DNA of a patient with Alzheimer's, for instance, scientists would create an embryo and direct it to grow only nerve cells, which are targeted by the disease.

"If you've got a cell line that carries the Alzheimer's trait ... you potentially have a way of looking at the onset and the progression of that disease," he said. "That's a really fundamental tool to be able to develop treatment."

Professor Livesey said he expected genetically inherited childhood diseases to be among the first to benefit from SCNT research. "Cystic fibrosis or even something like leukaemia. There are several cancers in children that could also be treated."

Professor Livesey said the likelihood of more permissive legislation would have an enormous impact on the scientific world's attitude to Australia. "We're in contact with expatriates overseas who want to come back to Australia," he said.

Victorian Innovation Minister John Brumby said the Senate decision would enable Australians to benefit first from medical breakthroughs.

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