

### Editorial

Dear Readers,

In this issue, we have packed it with news from around the globe. Florian gives us an update on the plans for the next ESACT meetings and developments at ACTIP. In the space of a few months, we see the meteoric rise and fall of a top stem cell scientist in S. Korea. A (very public) warning perhaps of the price of fame versus maintaining personal integrity in our pursuits of success, whether scientific or otherwise.

Over in the Far East, the Singapore government announced plans to invest over S\$ 10 billion into R&D from 2006 - 2010 which includes the setting up of a new National Research Foundation. In the US, President Bush outlines a US\$ 7.1 billion plan to combat a potential bird flu pandemic; many cases

which have appeared across several countries in Asia and Europe.

We feature an article on the use of mouse stem cells in healing sheep hearts. In the bioprocess arena, bioProcessUK has been formed to foster development of the bioprocess community and news about Amgen potentially setting up a manufacturing plant in Ireland is in the press.

God bless you one and all and have a restful Christmas!

Chief Editor, Steve Oh



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## A Word from the Chairman

Dear friends and colleagues,

A very successful year for ESACT ends soon.

We had a wonderful meeting in Harrogate, again thanks to Dr. Rod Smith and his team. I am sure that Harrogate, UK will go down in the History of ESACT as one of the most successful meetings we ever organised (a few records were broken anyway). In November the Executive Committee of ESACT received and listened to two excellent proposals for the 2009 meeting (Vienna, Dublin). Both, Professor Hermann Katinger and Professor Mohammed Al-Rubeai made it very difficult for us to decide. Their respective proposals were well thought through, complete and very appealing. A strong point for Dublin and Ireland is of course the fact that Ireland has presently probably the strongest political push for Biotech in Europe and it will be interesting for all of us to see how a small country is ready to transform its industry base and how they will eventually receive our seemingly ever growing cell culture crowd. But of course, Austria is also pushing Biotech quite strongly, not to make you have the wrong impressions. Anyway the Executive Committee was really struggling with the need to say Yes to one excellent proposal and No to another excellent one. Again thank you, Hermann and you, Mohammed, for the very exhaustive work you both have invested into this.

It is also no surprise to those of us who had been involved with earlier meetings that Dr. Hansjörg Hauser and his team are already quite busy in thinking ahead for the big event that will happen in 2007. Having not been in Dresden ever, but having heard and read so much good news about this city that was entirely flattened during the last war in Germany, I am actually very curious. It seems that the rebuilding of Dresden has finally closed the chapter of those terrible times in Europe that lasted until rather recently when Germany was still a divided country.

The other day, I came back from a meeting with the ACTIP group (Animal Cell Technology Industrial Platform) where representatives from Industry with interest in Animal Cell Technology meet. It was a good meeting and I was able to solicit some financial help for our JIN-website. It seems that my plea fell on fertile ground. You may remember that we had a bad surprise on the financing of the JIN website. Since there was a general agreement of the ACTIP crowd that the finding of well trained personnel in our field is much facilitated by JIN, I believe now that we will obtain the support for JIN from the industrial partners involved.

I hope you all will enjoy a few less hectic days during the upcoming holidays and I will be looking forward to seeing many of you during one or the other of the exciting meetings that will happen in 2006. I wish you health and happiness for you and your close ones for the upcoming new year.

Best wishes

Florian



## S. Korea Takes Lead in Stem Cell Research

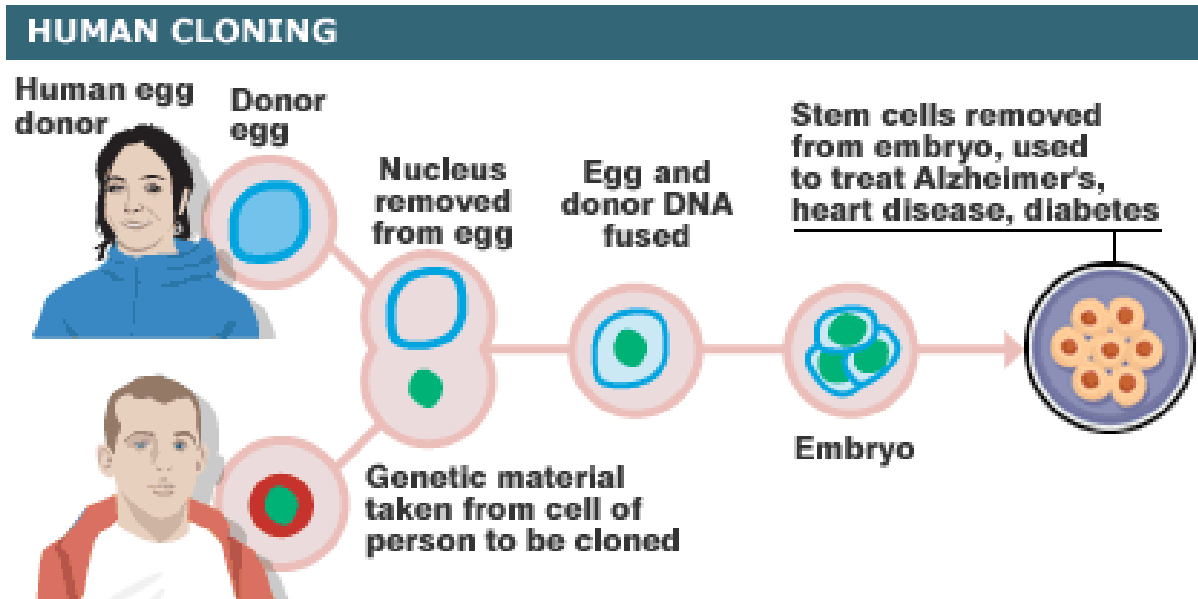
Just a few years ago, Michigan State University scientist Jose Cibelli was considered the leading expert on cloning human embryos to treat and study disease. Now, there's no debate that the cloning king is Hwang Woo-suk of Seoul National University. On Thursday, Hwang announced yet again that he had successfully cloned human embryos, this time extracting stem cells from embryos created using the DNA of sick and injured patients. It was the second time in a little more than a year that Hwang had successfully cloned. Hwang is succeeding where the United States is failing because generous South Korean government support helped him create an efficient cloning factory. In his lab, an army of researchers trained in specialized individual tasks mans a high-tech assembly line that often operates 24 hours a day, Cibelli and others say.

In contrast, the few U.S. researchers eager to clone are left scrambling for funds and staff and must contend with legal vagaries as well as staunch opposition from President Bush, who reaffirmed his position on Friday with a veto threat.

"I'm very concerned about cloning," Bush said. "I worry about a world in which cloning becomes accepted."

No U.S. scientist is known to be actively cloning, though several have plans to start soon. "We don't have this issue as a priority. We have Iraq and the economy and the price of gas and people aren't thinking of cures for diseases," said Cibelli, a co-author on the scientific paper Hwang published last year disclosing his first cloning success. "The Koreans have the complete support of their government."

Cibelli was the lead scientist at Worcester, Mass.-based Advanced Cell Technology when that company announced in 2001 it had cloned human embryos. But that experiment was widely seen outside the company as a failure because Cibelli and colleagues could only coax the cells to divide a few times before they died.



## Stem Cell Pioneer Disgraced



**A cloning pioneer regarded as a hero in his South Korean homeland has resigned and apologised for using human eggs from his own researchers.**

Professor Hwang Woo-suk was chairman of the World Stem Cell Hub, which opened this month, based in Seoul. "I am very sorry that I have to tell the public words that are too shameful and horrible," he announced publicly. International medical standards warn against using eggs from researchers who may be vulnerable to pressure. However, the health ministry in Seoul insists that he is not guilty of any moral or legal wrongdoing, as the eggs were given voluntarily, without the professor's knowledge, and before South Korea introduced a bioethics law in January.

Dr Hwang, 52, gained worldwide fame after producing the world's first cloned human embryos and stem cells tailored to be used on individuals. Human cloning science offers the possibility that stem cells harvested from cloned embryos could be used to treat diseases like Parkinson's, diabetes and heart disease.

Dr Hwang's breakthrough was seen as particularly important as the stem cells he created were a perfect match for the patient, which could mean treatments without the risk of the body rejecting them. However, opponents argue that creating and experimenting with human embryos is unethical.

### **Paid for eggs**

Earlier this month Gerald Schatten, a prominent American colleague of Dr Hwang, broke off their collaboration saying he was concerned by the way the group procured human eggs. When the medical journal Nature pressed Dr Hwang in 2004 about the origin of the eggs, he denied they had been donated by his own researchers. At a press conference on Thursday he admitted he had not told the truth.

Dr Hwang said when two women on his team offered their own eggs he turned them down. Later, the women donated their eggs under false names, without his permission. When asked about this he investigated, and was told about the provenance of the eggs, but lied to Nature because of a "strong request by the researchers to protect their privacy", he said.

South Korea's health ministry also admitted that other women were paid thousands of dollars for their eggs, though this took place without Dr Hwang's knowledge and before a new law outlawed trading in human eggs.

### **Egg shortage**

The professor said he was resigning from all public posts, including his chairmanship of the World Stem Cell Hub, which is designed to produce stem cell lines for disease research worldwide. "It is my way of seeking repentance," he said. He added he would continue his research at Seoul National University. "I again sincerely apologise for having stirred concern at home and abroad," he said.

"Being too focused on scientific development, I may not have seen all the ethical issues related to my research. "We needed a lot of ova [eggs] for the research but there were not enough ova around," Dr Hwang said, explaining why standards may have slipped. The research conducted by his team requires large numbers of human eggs, which are difficult to obtain.

### 'Stain'

The revelations have shaken fellow scientists. "We are saddened by the confusion that has arisen in Korea and the distress that has been caused to those concerned," said British professors Ian Wilmut and Christopher Shaw. There are no international laws governing the use of cells and embryos, but scientists said a tough regulatory climate - like that in force in the UK - could prevent such abuses or misunderstandings. "The excellent research carried out by Hwang and his team must continue, but in a way that considers the ethics in an appropriate way," said Prof Robin Lovell-Badge of the UK's National Institute for Medical Research.

## Singapore to invest more in R&D

In a speech celebrating 100 years of achievements in Physics, Dr. Tony Tan the Deputy Prime Minister announced broad guidelines to implement a comprehensive R&D strategy for Singapore with the following strategic thrusts.

1. Provide more resources for R&D in Singapore. While national expenditure on R&D was 2.15% of GDP in 2003, this target will be increased to 3% of GDP within the next 5 years.
2. Focus on selected areas of economic importance where Singapore is internationally competitive. Key clusters such as electronics, chemicals and biomedical sciences will be invested in. Potential new areas are environmental / water technologies and interactive and digital media.
3. Provide a balance of investigator-led and mission-oriented research in selected areas. Singapore will fund a broad spectrum of research but mission-oriented research investments will be significant. The Ministry of Trade and Industry will increase the budget from S\$4 billion for FY 2001-2005 to S\$5.4 billion for FY2006—2010.
4. Encourage even more private sector R&D in Singapore. Greater incentives will be provided in terms of infrastructure, scientific manpower and sophisticated intellectual property protection regulations. The aim is to have two-thirds of R&D primarily on the Development side to be carried out by the private sector and one-third primarily on the Research side carried out by the public sector.
5. Strengthening the nexus between R&D and business. Institutions are to improve their ability to commercialise their research and have closer collaborations with industry.

In addition, a further S\$ 5 billion will be set aside to establish a National Research Foundation directly under the Prime Minister's Office. The NRF will be responsible to implement the R&D strategic thrusts and fund longer term research. The goal is to transform Singapore into a talent magnet for scientific and innovation excellence to create a sustainable competitive advantage for Singapore's long term economic growth.

## Bush Outlines \$7.1B Flu-Fighting Strategy

President Bush outlined a \$7.1 billion strategy Tuesday to prepare for a possible world-wide super-flu outbreak, aiming to overhaul the vaccine industry so eventually every American could be inoculated within six months of a pandemic's beginning.

Such a huge change would take years to implement - Bush's goal is 2010 - and his plan drew immediate fire from critics who said it wouldn't provide enough protection in the meantime. The long-awaited strategy also stresses expanded attempts to detect and contain the next super-flu before it reaches the United States, with particular attention to parts of Asia that are influenza incubators - a global focus that flu specialists have insisted the government adopt.

"Early detection is our first line of defense," Bush said in a speech at the National Institutes of Health. He called on other countries to admit when super-flu strains occur within their borders. "No nation can afford to ignore this threat," he said.

At the same time, Bush sought to reassure a public jittery over the spread of bird flu, called H5N1, which has killed at least 62 people in Asia since 2003 and caused the death or destruction of tens of millions of birds.

There is no evidence that a human pandemic, of H5N1 or any other super-strain, is about to start, Bush said repeatedly.

Still, there have been three flu pandemics in the last century and the world is overdue for another. Concern is growing that the bird flu could provide the spark if it one day mutates so that it can spread easily from person to person.

"Our country has been given fair warning of this danger to our homeland, and needs time to prepare," Bush said.

Topping Bush's strategy:

-\$1.2 billion to stockpile enough vaccine against the current H5N1 flu strain to protect 20 million Americans, the estimated number of health workers and other first-responders involved in a pandemic.

-\$1 billion for the drugs Tamiflu and Relenza, which can treat and, in some cases, prevent flu infection. Enough drugs to treat 44 million people and prevent infection in 6 million others to be put into the federal stockpile. States were told to buy 31 million treatment courses, but Bush is funding only a quarter of the states' anticipated bill.

-\$2.8 billion to speed production of pandemic vaccines - including better-matched strains - by learning to manufacture them in easier-to-handle cell cultures, instead of today's slow method that relies on millions of chicken eggs.

-\$251 million for international preparations, including improving early-warning systems to spot human infections with novel flu strains.

-\$251 million for international preparations, including improving early-warning systems to spot human infections with novel flu strains.

-\$100 million for state preparations, including determining how to deliver stockpiled medicines directly to patients.

-\$56 million to test poultry and wild birds for H5N1 or other novel flu strains entering the U.S. bird population.

-A call for Congress to provide liability protection for makers of a pandemic vaccine, which unlike shots against the regular winter flu would be experimental, largely untested. Bush's announcement came after his administration was battered by criticism over its lethargic response to Hurricane Katrina.

Public health specialists, briefed on the strategy but awaiting details, called it a good start. "Clearly this is the No. 1 public health issue on the radar screen," said Michael Osterholm of the University of Minnesota, who advises the government on infectious disease threats.

But it's not strong enough, said Sen. Edward Kennedy, D-Mass., who helped lead Senate passage of \$8 billion in emergency funding for pandemic preparations last month.

"Stockpiles alone aren't enough without the capacity to make use of them," he said, calling for steps to help states, cities and hospitals prepare for a flood of panicked patients.

"There is a gaping hole" in the plan, added Sen. Charles Schumer, D-N.Y., who said the nation should stockpile enough Tamiflu for half the population, not the quarter that would be covered if the states added their share under Bush's plan.

The states' contribution will be difficult, said Republican Arkansas Gov. Mike Huckabee, chairman of the National Governors Association. "They expect us to pay 75 cents on a dollar for flu medicine - that's going to be a tough pill to swallow," he said through a spokeswoman.

The states' collective tab would reach \$510 million, said Kim Elliott, deputy director of the nonpartisan Trust for America's Health. She worried that some wouldn't buy any, and that others wouldn't share their Tamiflu stash if a pandemic struck in a part of the country that ran out.

"It depends on where you live and the state of your state's budget as to whether or not you might receive a treatment drug," she said.

If a pandemic strikes, the Department of Health and Human Services will direct the medical response, and on Wednesday it will unveil long-awaited details. Still to be finalized is a plan from the Homeland Security Department, which will coordinate how the government balances protecting the public with keeping schools, businesses and transportation sectors running.

## Mouse stem cells heal sheep hearts

A sheep with a heart attack can be helped to heal with mouse stem cells. Embryonic stem cells from mice can help mend the broken hearts of sheep. This cross-species experiment is one more step in finding out whether human embryonic stem cells can mend the damage done by heart attacks.

A heart attack damages the muscle and blood vessels that allow a heart to pump blood around the body. Doctors have long sought a way to repair this damage, and some experts say that embryonic stem cells hold the answer. These cells have the potential to turn into any type of cell needed, such as heart-muscle cells.

Studies have already shown that embryonic stem cells can improve blood flow after an attack in small animals, such as rodents (1). But in people, ethical controversies have slowed research into the benefits of embryonic stem cells for ailing hearts.

In human trials scientists have used stem cells from a patient's bone marrow to help the healing. These cells are not as flexible as embryonic ones, but can sometimes be persuaded to turn into the desired cell types. Patients treated this way are able to pump more blood after a heart attack than those who don't get the treatment. But researchers hope that embryonic stem cells might have a greater effect.

### Sheep well

Michel Puc at of the French National Centre for Scientific Research in Montpellier and his colleagues decided to test embryonic stem cells in sheep to see how well they work in large mammals. Because there is not much call for sheep embryonic stem cells, they are hard to source, so the team used mouse cells instead.

The researchers injected about 30 million cells into the hearts of nine sheep that had suffered heart attacks (2). They found that the sheep pumped blood through their hearts 15% more efficiently than the untreated sheep a month after the injections. Distinctive markers from the stem cells were found inside the sheep hearts, proving that the stem cells had gone to work and replaced some of the damaged tissue. The team reports its results in the *Lancet*. "I think it's very exciting," says Joshua Hare, an expert in cardiac transplantation at the Johns Hopkins University School of Medicine in Baltimore, Maryland.

For the moment, the improvement is of the same order of magnitude as that achieved in humans with bone marrow transplants. But Hare says that the healing should increase over time: other studies have shown the biggest benefit from stem cells two months after injections. Puc at says that this form of cardiac therapy holds much future promise. He and his colleagues are currently conducting tests to assess the healing power of human embryonic stem cells in baboons.

### References

- 1) Orlic D., et al. *Ann. N Y Acad Sci.*, 938. 221 - 229 (2001). | PubMed | ChemPort |
- 2) Menard C., et al. *Lancet*, 366. 1005 - 1002 (2005).

## bioProcessUK

bioProcessUK is a Knowledge Transfer Network funded through the DTI Technology Programme, and managed by the BioIndustry Association. It is dedicated to the advancement of the bioprocessing sector in the UK. The BIA have been awarded DTI funding totalling £3 million over 4 years to establish a National Knowledge Transfer Network, following its bid to the DTI technology programme. The funding follows the recommendation by the Bioscience and Innovation Growth Team Report, [Bioscience 2015](#), that the UK build a strong bioprocessing sub-sector. The first step will be to foster community development, harnessing the expertise in the country to deliver an internationally competitive sector. The outputs of bioProcessUK are to be:

- Develop a growing number of well networked young scientists and engineers and bioprocess leaders in the field of bioprocessing
  - Benchmark the UK in terms of bioprocessing with respect to the US, Europe, the Far East and elsewhere
  - Develop a consolidated viewpoint on what the UK Government could do to assist the technological developments and aspects of bioprocessing
  - Develop a clear and increasing profile for the UK bioprocessing industry internationally.
- Support the development of more and stronger companies with a strong IP base for the UK

Earlier this year Dr Malcolm Rhodes (formerly of Serologicals now Celliance, Scotland) was announced as Technical Director and Tony Bradshaw as the network Director.

## Amgen in €1.3bn Cork deal talks

A €1.3 billion deal which would create hundreds of jobs in Cork, Republic of Ireland hangs in the balance. Although discussions are under way between Amgen, the world's biggest biopharmaceutical company, and IDA (Industrial Development Agency) Ireland about an expansion to Cork, no deal has yet been finalised. It is understood that a site in Carrigtwohill is the front-runner for the location of the plant. The company has already carried out a thorough examination of a site in the area but talks are also under way about locations in Switzerland and Singapore. Talks between senior Irish Government officials and the company are at a very sensitive stage and a decision is imminent. If Cork is selected, it is expected that the board at Amgen will announce soon when the building and production of their new facility will commence.

The company confirmed that talks have taken place with the IDA. Amgen spokeswoman Mary Klem said Ireland was on the company's shortlist as a potential location for a new manufacturing plant. "Over the past two years, Amgen has evaluated a number of potential global locations, including Ireland, Switzerland and Singapore, to establish a manufacturing plant," she said. "Discussions are taking place between Amgen and IDA Ireland regarding a potential Irish location. If a decision is made by Amgen to locate in Ireland, a full announcement will be made." She added that it would be inappropriate to comment any further at this stage.

The IDA, however have refused to comment on the situation. A spokeswoman said: "While we may be in discussions, we don't have any comment to make at this time." Minister for Enterprise, Trade and Employment, Micheál Martin refused to comment on the possible expansion and said Cork is being actively looked at by many bio-pharma and financial services companies as a possible location. "We are working with many companies across different sectors and we are constantly seeking to attract investment into Ireland," he said. Amgen opened a small sales team in Dublin two years ago, which is used to market its drugs in the Irish market. The company has its headquarters in Thousand Oaks, California and employs 14,000 people. Last year it reported revenues of \$10.6 billion. It has operations in many European countries and was last year named as Forbes company of the year.



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