

PRE-CONGRESS COURSE 5

SIG Stem Cells & SIG Ethics & Law

"Ethical and scientific analysis of controversial developments in stem cell research"

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PRE-CONGRESS COURSE 5 - PROGRAMME

SIG Stem Cells / SIG Ethics & Law

Ethical and scientific analysis of controversial developments in stem cell research

Course coordinators: A. Veiga (E) and G. Pennings (B)

Course description: The course aims to stimulate the discussion between researchers and ethicists by pairing scientific and ethical presentations on specific topics. A number of these topics are connected to the eternal and ubiquitous question of the acceptability of creating and using human embryos for research. The question of the moral status of the embryo receives special attention in the context of stem cell research because a number of recent developments reveal new aspects: are the entities created by some techniques embryos and if so, how should they be treated? The first topic focusses on chimaeric and hybrid embryos. Similar questions are brought up in the second presentation on the use of possible alternatives to obtain 'embryonic' stem cells like Altered Nuclear Transfer. The afternoon considers two less frequently looked upon topics. The first considers the feasibility and implications of the derivation of gametes from stem cells. The last talk tackles the complex issue of patentability and commercialization of human embryonic stem cell lines.

Target audience: Stem cell researchers interested in ethics and ethicists interested in stem cell research

Programme

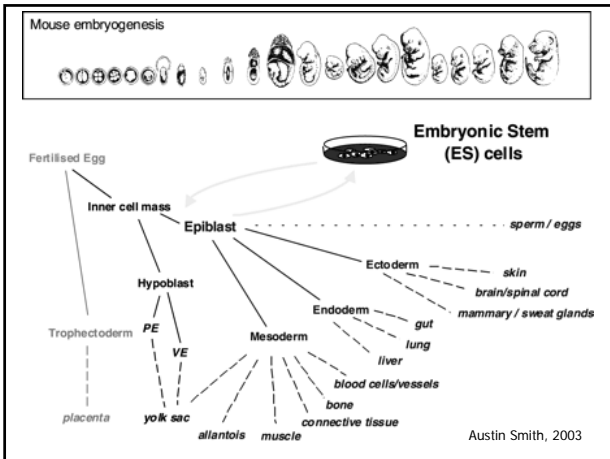
- 09.00 – 09.30: Stem cells from chimaeric and hybrid embryos: scientific aspects -**S. Minger (UK)**
09.30 – 09.45: *Discussion*
- 09.45 – 10.15: Chimera and hybrid embryos: ethical issues -**F. Shenfield (UK)**
10.15 – 10.30: *Discussion*
- 10.30 – 11.00: Coffee break**
- 11.00 – 11.30: All roads lead to Rome? The quest for alternative sources of pluripotent cells –
R. Vassena (E)
11.30 – 11.45: *Discussion*
- 11.45 – 12.15: Alternatives for embryonic stem cell derivation: ethical aspects -**G. de Wert (NL)**
12.15 – 12.30: *Discussion*
- 12.30 – 13.30: Lunch**
- 13.30 – 14.00: Sperm from stem cells -**K. Nayernia (D)**
14.00 – 14.15: *Discussion*
- 14.15 – 14.45: Gametes derived from embryonic stem cells: ethical aspects -**H. Mertes (B)**

14.45 – 15.00: *Discussion*

15.00 – 15.30: **Coffee break**

15.30 – 16.00: Patentability and commercialization of human embryonic stem cell lines -**G. Porter (UK)**

16.00 – 17.00: General discussion

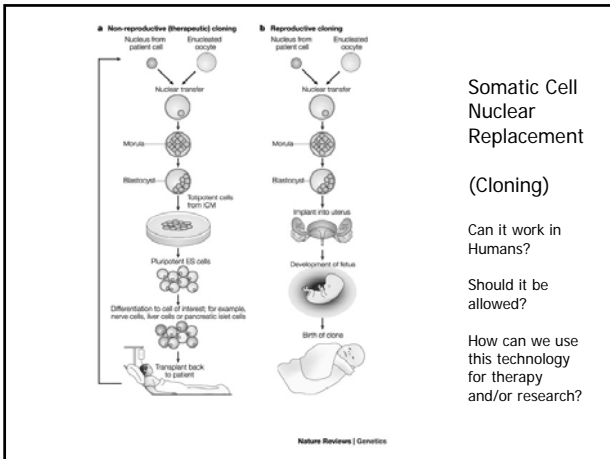


Human Embryo Research in UK

- Human Fertilisation and Embryology Authority Created in 1990
- All Reproductive Medicine & Human Embryo Research must be licensed by HFEA
- HFEA-Licensed Embryo Research Areas
 - Treatment of Infertility
 - Causes of Congenital Diseases
 - Causes of Miscarriage
 - Development of more Effective Conception
 - Improvements in Preimplantation Genetic Diagnosis
 - **Provide Understanding of Human Development**
 - **Provide Understanding of Human Disease**
 - **Enable Development of Therapies of Human Disease**

License for Derivation of Human ES cells from UK Human Fertilisation and Embryology Authority

- Awarded to Drs Susan Pickering, Stephen Minger & Professor Peter Braude in May 2002 – renewed in 2005 for three additional years
- Derivation from donated embryos with informed consent
- No financial inducement for donation
- Cannot create embryos for stem cell derivation
- All cell lines must be deposited in UK Stem Cell Bank and made freely available to other research groups
- Cell Nuclear Replacement (Therapeutic) using human oocytes permitted with license
- Cell Nuclear Replacement (Reproductive) banned with criminal penalties



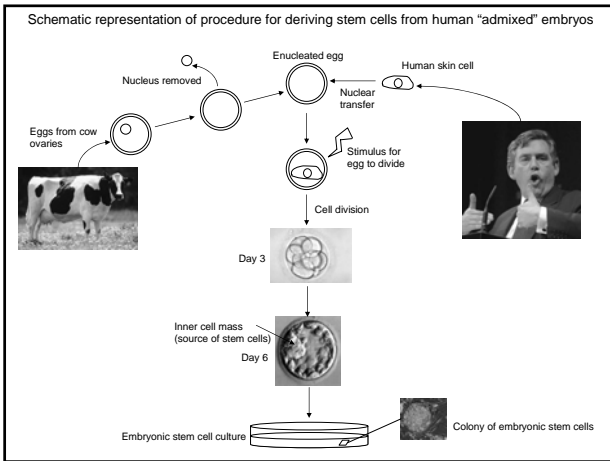
Somatic Cell Nuclear Replacement

(Cloning)

Can it work in Humans?

Should it be allowed?

How can we use this technology for therapy and/or research?



SCNT Cell Lines

- Use fibroblast from patients with FAD, SMA, $\epsilon 4+/\epsilon 4+$ and genetic forms of PD, MND, FTD
- Clone cells into non-human oocytes & iPS
- Generate cloned hES cell lines
- Differentiate hES cells -> selectively vulnerable neural populations
- Establish "disease in a dish" cellular models
- Alternative – homologous recombination - HD

Strengths of UK Stem Cell Research

- World-class academic research centres
- Tight regulation on Assisted Reproduction & Human Embryo Research by HFEA
- Government Commitment to Stem Cell Research (~£45 million – 2003-2004); £350-800 million 10-year strategy from Chancellor's Office announced Dec 2005
- Government Funded UK Stem Cell Bank for foetal, adult & embryonic human stem cell lines
- London Regenerative Medicine Network – drive towards clinical applications
- UK Stem Cell Network – integration of all UK regional network



Sarah Pringle, Robbin Connor, Zhenling Luo, Kassima Varshou, Wood, Julie Ghosh, Daniel Webster, Jessica Cooke, Hannah Taylor, Antigoni Ekonomou, SH Cedar, Christian Shatapathy, Yuhui Wu

Stem Cell Biology Laboratory Collaborators

<p>Human ES Cells Peter Braude Sara Hall Glenda Cornwall Emma Stephenson</p> <p>Spinal Cord Repair Steve McMahon Liz Bradbury Paul Fells Merion Davies</p> <p>Tooth Replacement Paul Sharpe</p> <p>Proteomics Tony Ng Simon Ameer-Beg Sukhi Bansal Giampietro Schiavo (CRUK) Jonas Bergquist (Uppsala)</p>	<p>Pancreatic Islet Cells Peter Jones Shanta Persaud</p> <p>Hepatic Stem Cells Anil Dhawan Robin Hughes Ragai Mitry</p> <p>Neural Differentiation Jonathan Corcoran Bla Goncalves</p> <p>Parkinson's Disease Peter Jenner Susan Duty</p> <p>Electrophysiology Reginald Docherty</p> <p>Cardiac Repair Anthony Mathur (Barts) Matthew Lovell (Barts)</p>	<p>Skin Differentiation John McGrath Noor Alimaani</p> <p>Retinal Regeneration Robin Ali (UCL/Moorfields)</p> <p>Lung Differentiation Carol Jones (Novartis) Phil Kemp (Novartis)</p> <p>Bioethics & Politics Claire Williams Steve Wainright Sarah Franklin (LSE) Brian Salter (Norwich) Herbert Gottweis (Vienna)</p> <p>Joint and Bone Development Agi Grigoriadis</p>	<p>Blood Stem Cells Paul Fairchild (Oxford) Karl Larsson (Oxford)</p> <p>Huntington's Disease Gillian Bates Eva Sirinathsinghji Liza Sutton</p> <p>Bioprocessing Chris Mason (UCL)</p> <p>Vascular Development Karan Hirschi (Bayler) Qingbo Xu</p> <p>Adult Neurogenesis Clive Ballard Omar Pathmanaban Manuel Mayr Christos Tolias Elaine Perry (Newcastle) Robert Perry (Newcastle)</p>
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Medical Research Council, Mrs Lily Safra, BBSRC, ESRC, EPSRC,
 European Commission, Oliver Bird Foundation, UK DTI, Francesca Patrizi,
 High O Foundation, Wellcome Trust, Huntington's Disease Society, John & Helen Robertson,
 Alzheimer's Research Trust, Liz & John Hancock, Guy's & St Thomas' Charitable Trust
