KING'S College LONDON
University of London

Sociological Reflections on Translational Research: Embryonic Stem Cells, Diabetes and Neuroscience

Beyond Pattison: Challenges to Stem Cell Translation & Policy
Wellcome Trust, London, (7-8 May, 2009)

Steven Wainwright
CBAS, School of Social Science & Public Policy
www.kcl.ac.uk/schools/sspp/interdisciplinary/cbas/

Mapping stem cell innovation in action: an ethnography of the bench-bedside interface (2004-2006)

Clare Williams, Steven Wainwright, Alan Cribb, Bobbie Farsides, Nigel Heaton & Mike Michael

Spaces of stem cell science: exploring processes of translational research (2007-2009)

Steven Wainwright & Clare Williams

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

the social science stem cell initiative

Goldsmiths UNIVERSITY OF LONDON

KING'S College LONDON

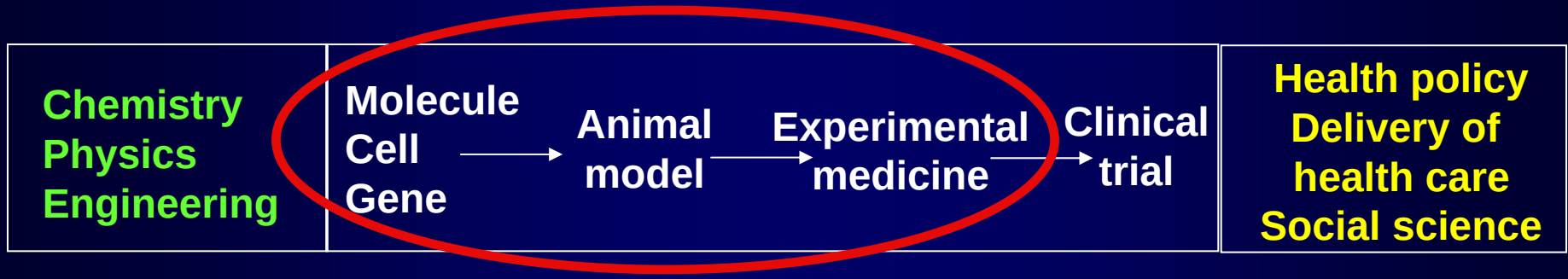
University of London

Outline

1. Introduction: sociology and translational research
2. Prospects of hES cells as a cure for diabetes
3. Bourdieu and the fields of science and medicine
4. From cell transplant to disease in a dish?
5. Conclusion: translational research revisited

The Biomedical Translational Research Pathway

→ The health-related research pathway →

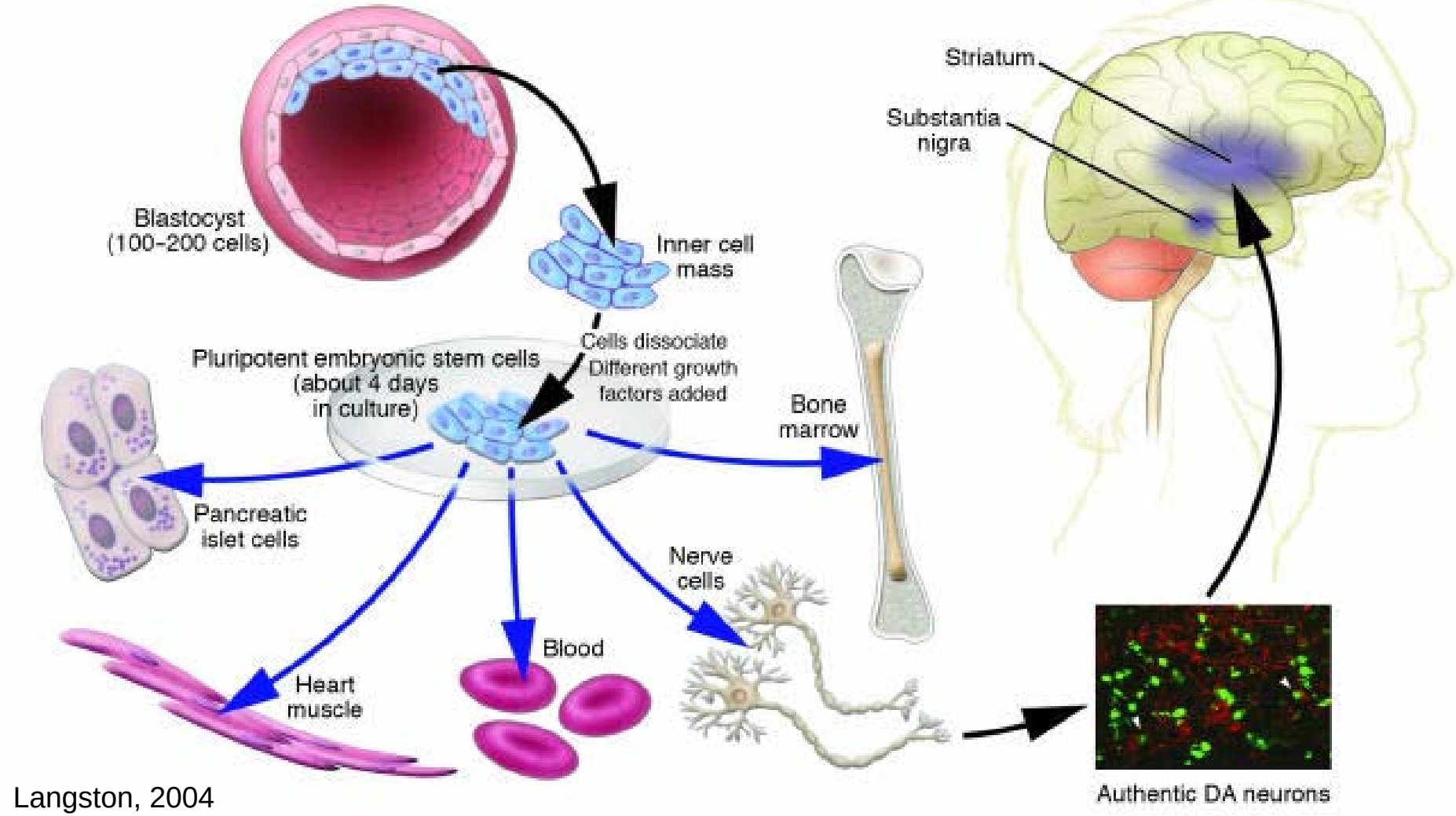


CBAS - ESRC & Wellcome Sociology of New Medical Technologies

Figure adapted from Prof Robert Lechler, King's College London

Curing Parkinson's? DA Neurons from hES Cells

Wainwright, S.P. (2005) Can stem cells cure Parkinson's disease? Embryonic steps toward a regenerative brain medicine. *British Journal of Neuroscience Nursing* 1 (3): 61-66.

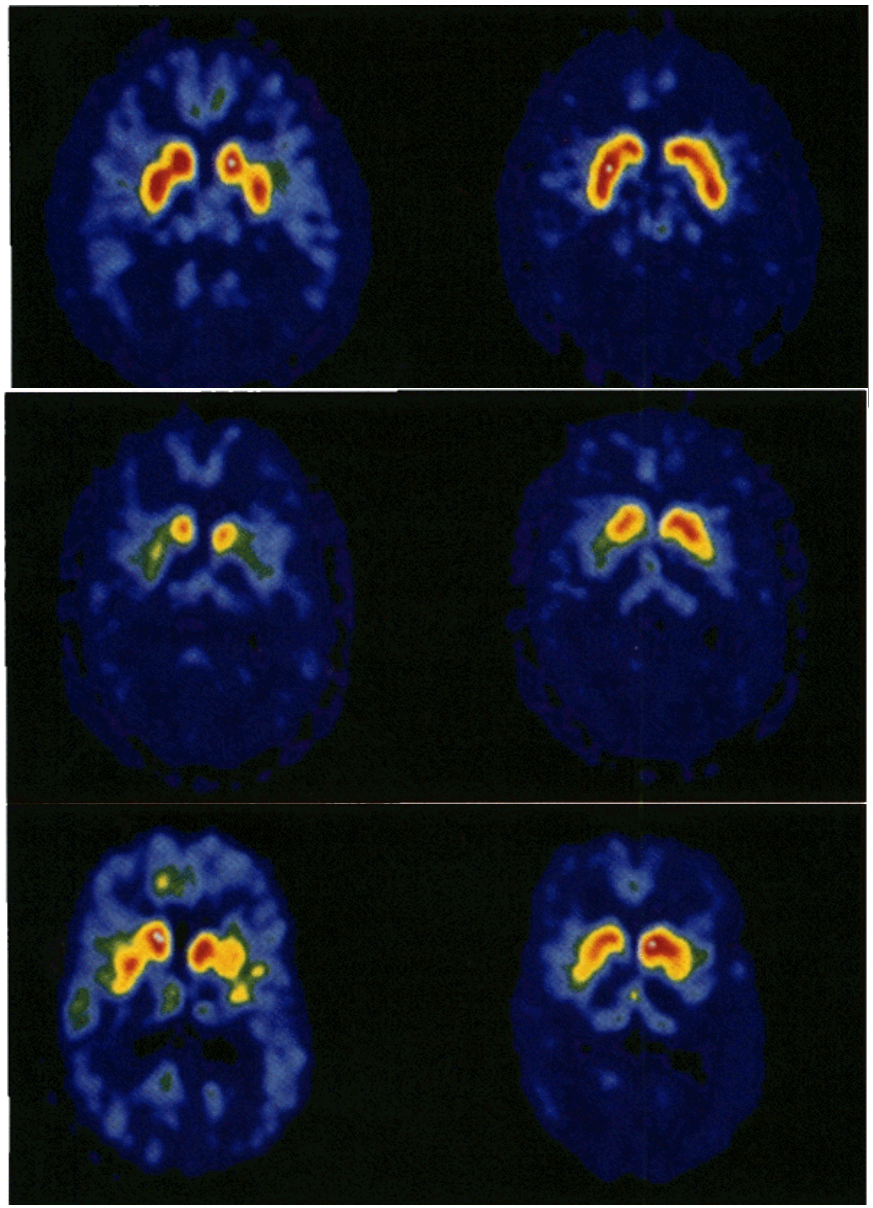


Langston, 2004

4Ms of Translation: Molecules – Mouse – Man – Multicentre Trials

Wainwright et al (2009) *Handbook of Genetics & Society*

Curing Parkinson's: DA Neurons from Foetal Cells



From Experiment to RCT

1. PET: Normal control

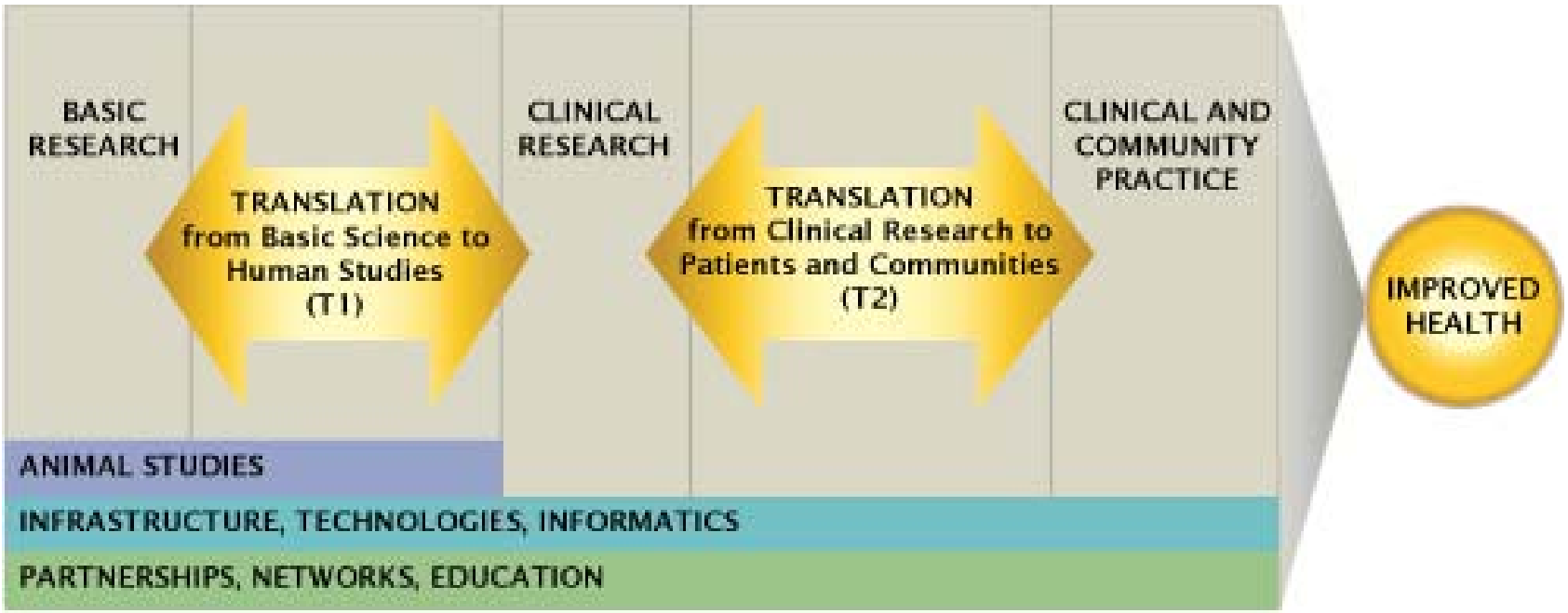
2. PET: PD (L) & PD + FCTx (R) 9/12

3. PET: PD + FCTx 33/12

Proof of Principle *vs* RCT

Stanford, Web

Institute of Medicine's Clinical Research Roundtable
Continuum of Biomedical Research: T1 & **T2**



NCRR Strategic Plan 2009-2013

T1 - transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy, and prevention and their first testing in humans

T2 - translation of results from clinical studies into everyday clinical practice

Woolf, S.H. (2008) The Meaning of Translational Research and Why It Matters. *JAMA, 299*(2): 211-213.

Translation of Major Basic Science Promises

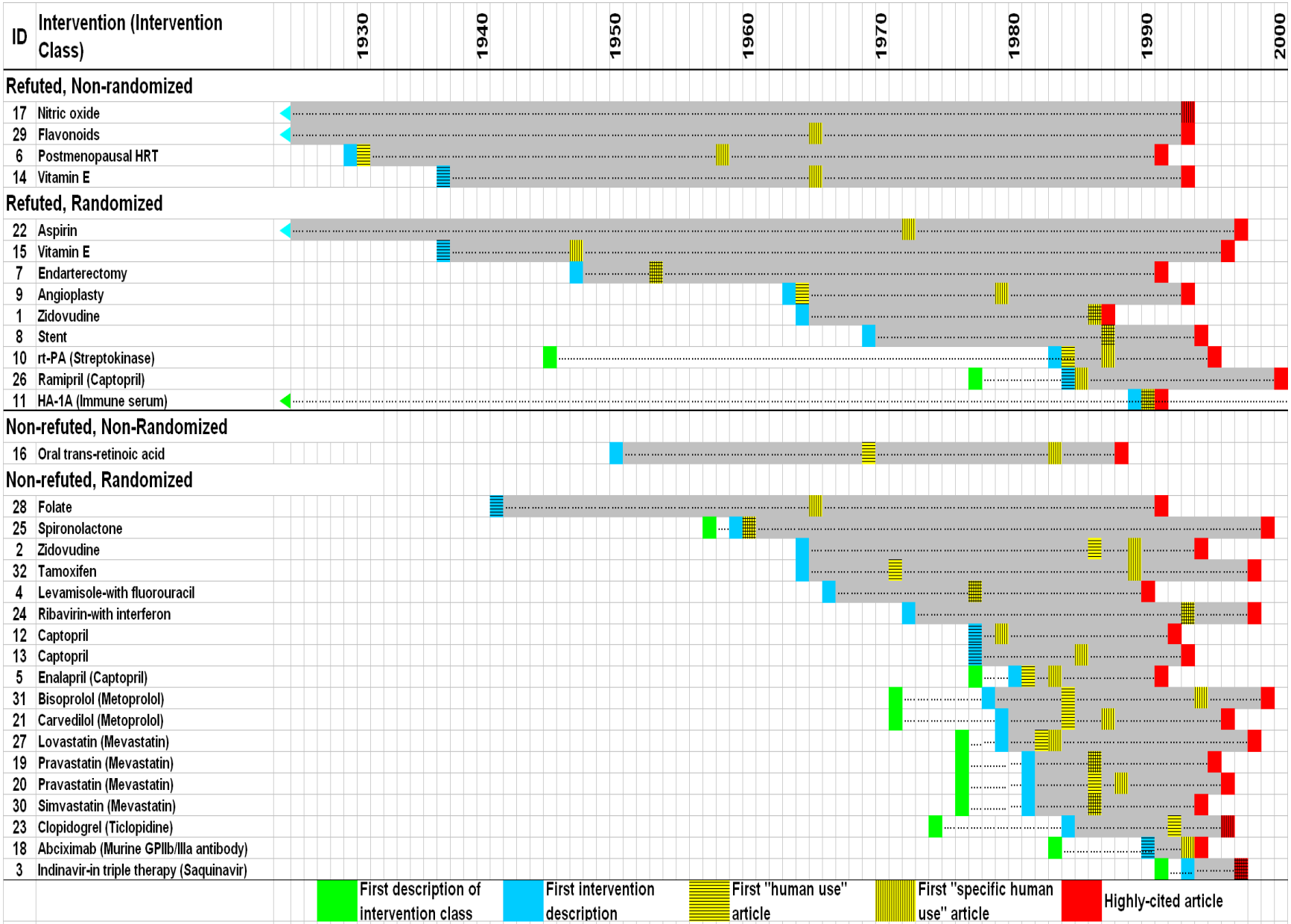
Translation of highly promising basic science research into clinical research occurs sparingly and with considerable time lag

Limited empirical data on:

1. how frequently these promises are materialized
2. reach the stage of clinical application
3. reach the stage of routine clinical use
4. what is the time frame for this translation

Contopoulos-Ioannidis et al (2003), Am J Med; Ioannidis (2004) Translational Med

The Glacial Pace of Clinical Translation (of Drugs!)



Ioannidis, JAMA 2005

Trial Initiation = Medical Achievement (Geron ESC4SCI)

A trial of <u>one</u> application, not a trial of <u>all</u> ES cells… but

• This... marks the dawn of a new era in medical therapeutics. This approach is one that reaches beyond pills and scalpels to achieve a new level of healing
Thomas Okarma, Geron CEO

• Today's news... is a milestone in the new era of hope
Amy Comstock Rick, Coalition for the Advancement of Medical Research

• This is what we've all been waiting for
Robert Lanza, Advanced Cell Technology

• The announcement boosted the price of shares in [Geron]... up 56% from the day before the announcement
Meridith Wadman, Nature, Jan 27, 2009

If embryonic stem cell work is anything like practically every other major medical advancement, be prepared for a very long, tough slog with lots of setbacks (Jon Kimmelman, Blog, 2009)

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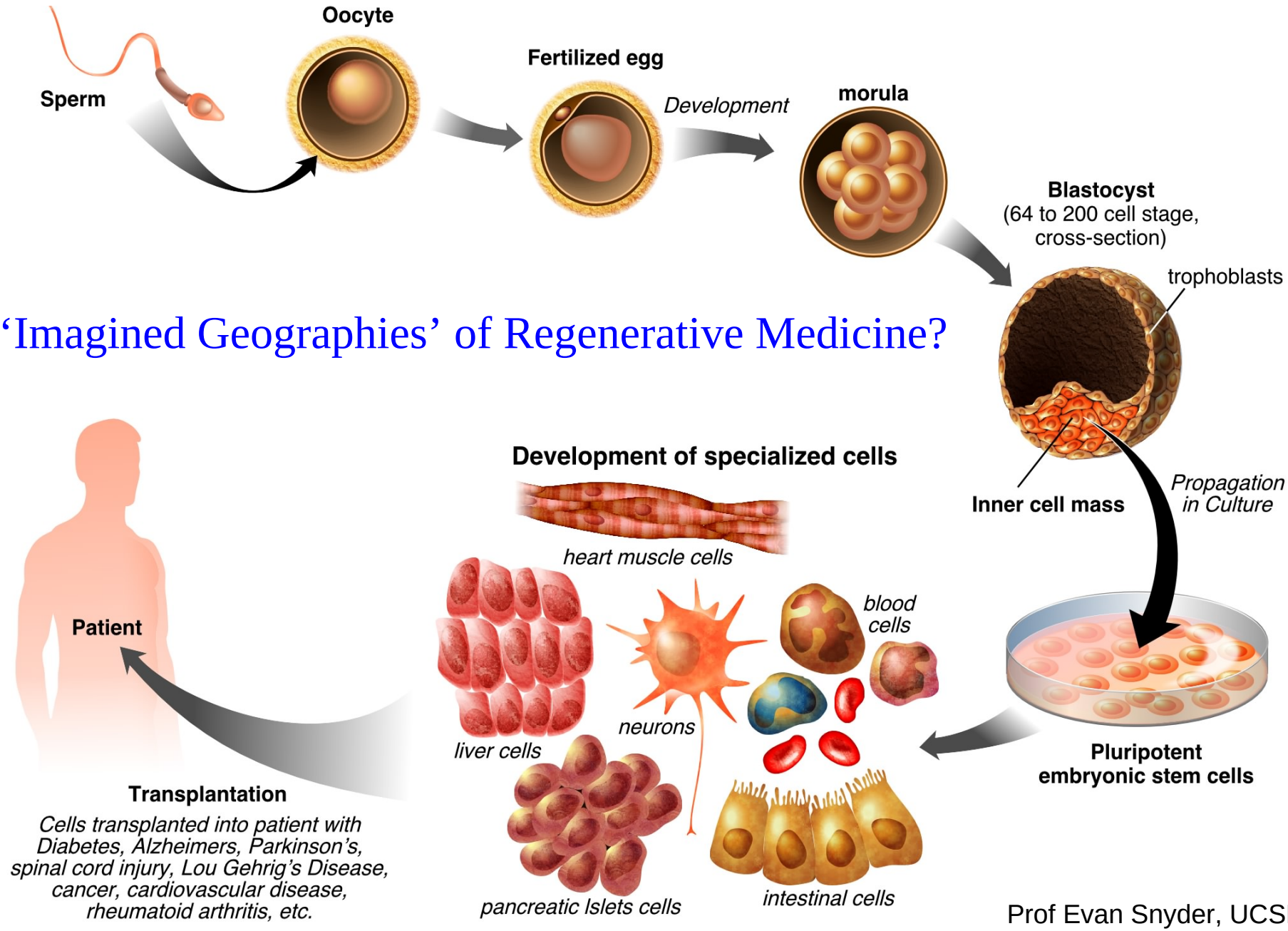
Stem Cell Labs Fieldwork in the UK & USA

Fieldwork: Southern California Stem Cell Consortium / The San Diego Consortium for Regenerative Medicine

Prof Evan Snyder, Burnham/UCSD

Stem Cell Therapy: Cell Transplants & Regenerative Medicine



'Imagined Geographies' of Regenerative Medicine?

Prof Evan Snyder, UCSD

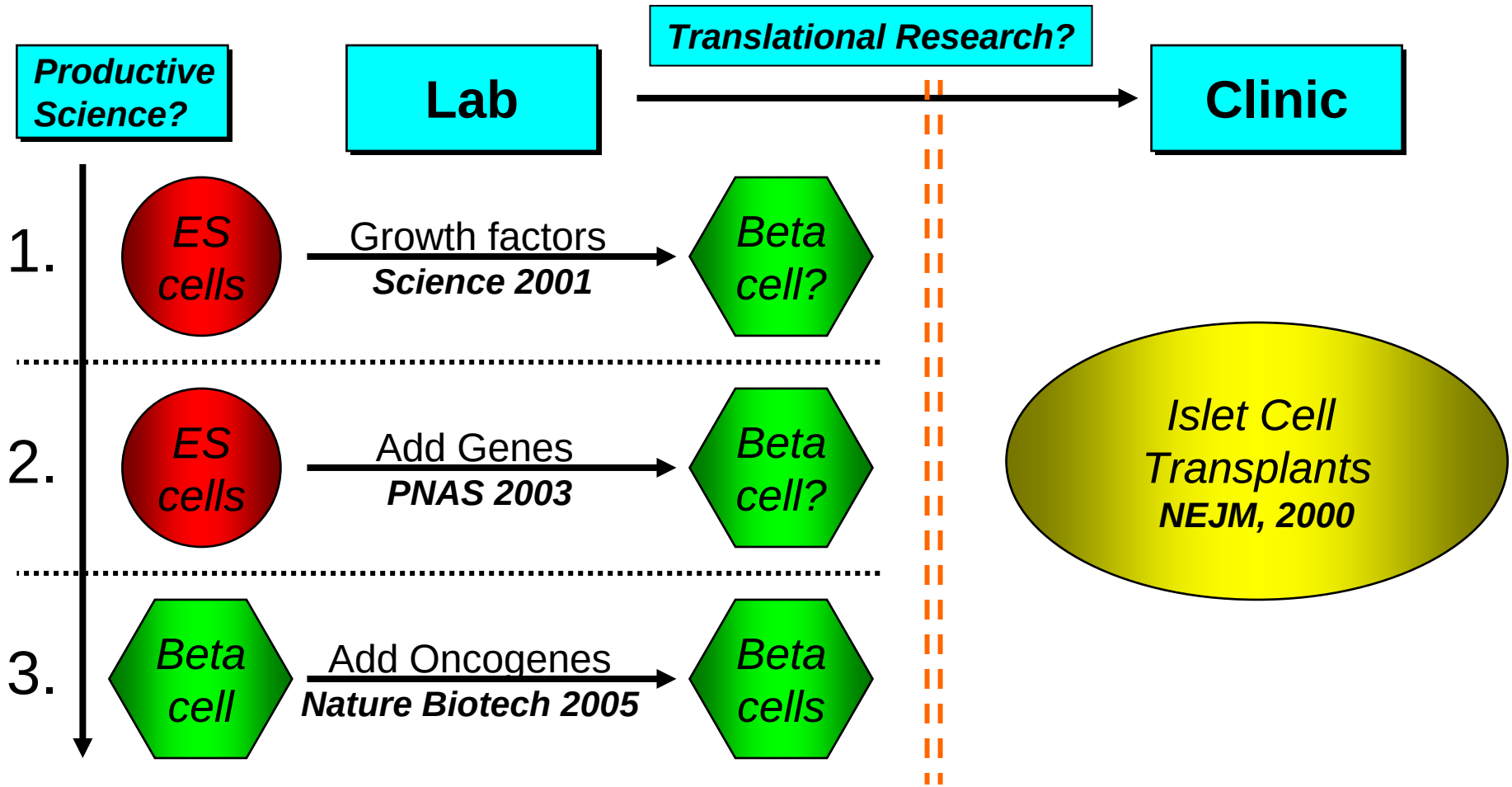
Curing Type-1 Diabetes with ‘Stem Cell’ Transplants?

Four steps to a holy grail of regenerative medicine?

1. Islet cell transplants *can* cure Type-1 diabetes
2. *Need* new supply of cells (huge shortfall of cadaver cells)
3. ES cells *best* source of unlimited cells
4. Hence, ‘ES cell therapy’ *will* cure Type-1 diabetes

Bonner-Weir, S. & Weir, G.C. (2005) New sources of pancreatic Beta-cells. *Nature Biotechnology* 23: 857 – 886.

Figure 1: Boundary work, boundary crossings and the lab-clinic interface: from stem cells to cell transplants for diabetes?



We argue the perceived success of islet cell transplants helped stimulate scientific demand for 'making beta cells'. In this figure, scientists want to move *horizontally* so as to cross the lab-clinic boundary through translational research. However, this has not yet been possible as with strategies 1 & 2 only approximately 1:1000 cells produce around 0.001% insulin of a primary beta cell. In contrast, with strategy 3, almost all cells produce 40% of the insulin of a primary beta cell. Scientists have, therefore, been 'driven down' the *vertical* axis (from strategy 1 to 3), thereby crossing two clinically and socially contested 'genetic boundaries' (i.e. adding insulin promoter genes, adding oncogenes). These moves maintain expectations of the ability of scientists to make 'functioning beta cells', which can potentially be used in the clinic. Moreover, this series of vertical moves also allows researchers to engage in productive (publishable) science. In brief, the 'pull of the clinic' combines with 'the push of productivity' to lure scientists across 'socially contested boundaries'.

Wainwright et al (2007) *New Genetics & Society*

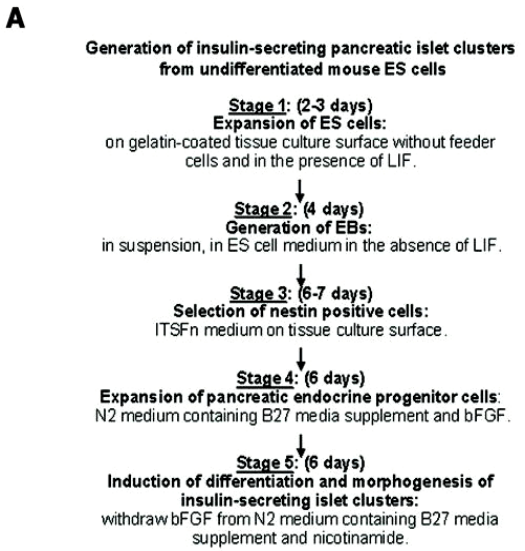
1. Lumelsky et al: A view from our US Fieldwork - 2005

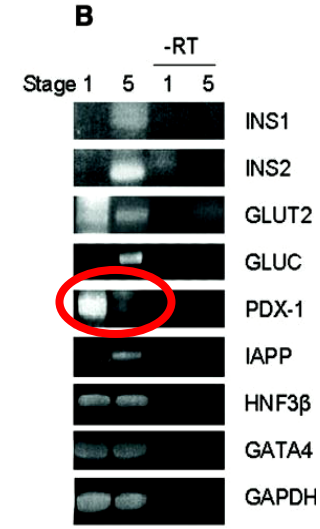
You look at that [Lumelsky] paper and see that it is fundamentally flawed from the very beginning. How it passed through the review process I have no idea. When I first read that paper, I thought it was nonsense… There was hardly any insulin message, the PDX1 message, which is critical for pancreas and beta cell formation, went ***down*** when she differentiated her cells… **People were screaming at one another at one meeting, and Ron McKay was extremely upset. It was amazing. There's some scientific sociology for you!** It's had an enormous impact, a disastrous impact on the field.

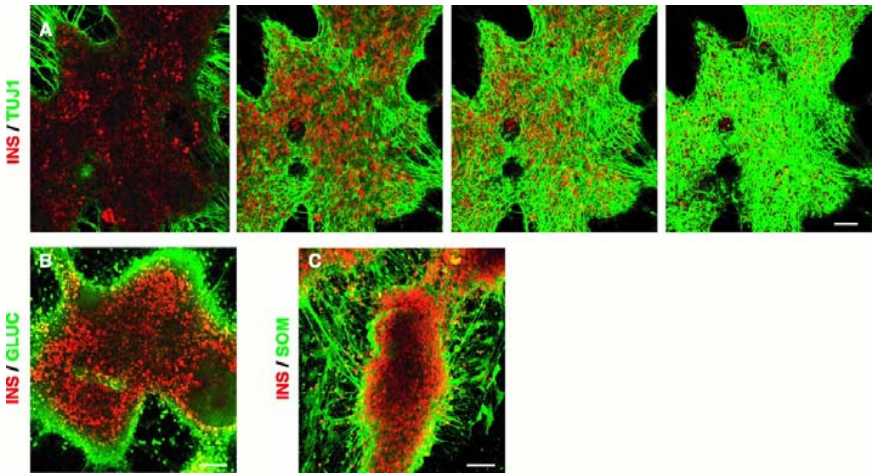
I think it's set the field back for a couple of years. And in this country people were reproducing and extending this result. You still see it today on grants where people reference it. So I think it was a major fiasco… It was a terrible thing that happened, as they [scientists] dropped everything and tried to repeat and extend their protocol. And the protocol was wrong. So it's a disaster. How many hundreds of scientific man-years and millions of dollars were devoted to that protocol in one way or another? It's just a complete waste. That, for me, is a pretty decent definition of a disaster… **Interestingly still not retracted to this day… Lumelski became a tenured track position in NIH based on that paper.** (Scientist 28, USA)

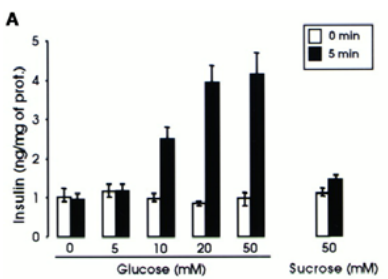
Michael et al (2007) *Science Studies*

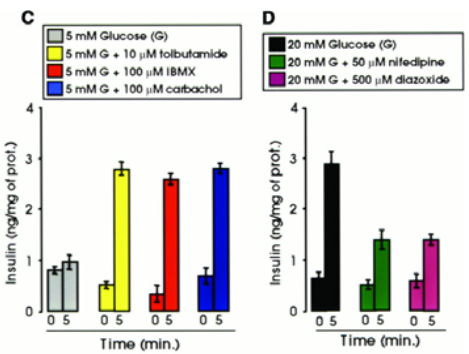
1. Contested Science: Ron McKay *vs* Doug Melton

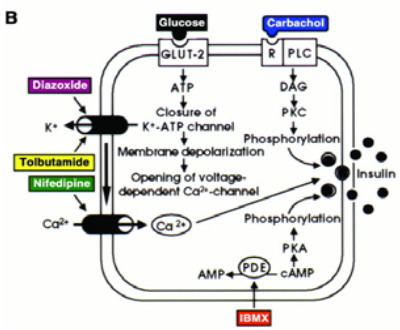


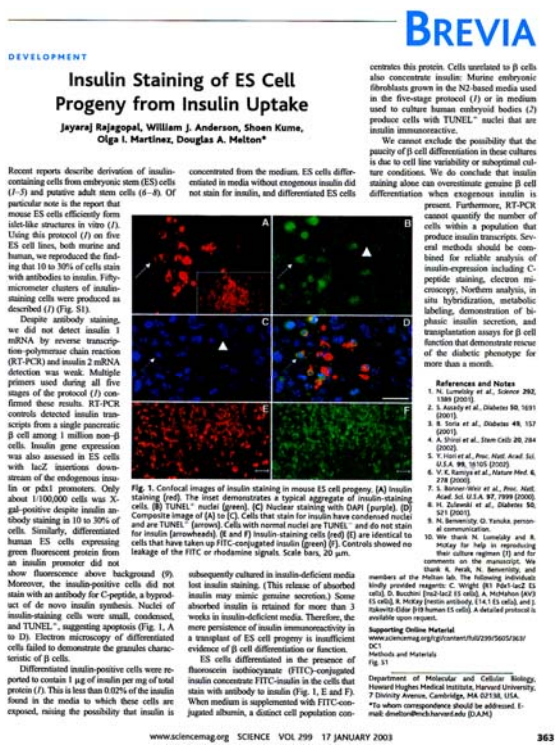












BREVIA

DEVELOPMENT

Insulin Staining of ES Cell Progeny from Insulin Uptake

Jayaraj Rajagopal, William J. Anderson, Shoen Kume, Olga I. Martinez, Douglas A. Melton*

Recent reports describe derivation of insulin-containing cells from embryonic stem (ES) cells (*1–3*) and putative adult stem cells (*4–8*). Of particular note is the report that mouse ES cells efficiently form islet-like structures in vitro (*1*). Using this protocol (*1*) on five ES cell lines, both murine and human, we reproduced the finding that 10 to 30% of cells stain with antibodies to insulin. Fifty-micrometer clusters of insulin-staining cells were produced as described (*1*) (Fig. S1).

Despite antibody staining, we did not detect insulin 1 mRNA by reverse transcription–polymerase chain reaction (RT-PCR) and insulin 2 mRNA detection was weak. Multiple primers used during all five stages of the protocol (*1*) confirmed these results. RT-PCR controls detected insulin transcripts from a single pancreatic β cell among 1 million non-β cells. Insulin gene expression was also assessed in ES cells with lacZ insertions downstream of the endogenous insulin or pdx1 promoters. Only about 1/100,000 cells was X-gal–positive despite insulin antibody staining in 10 to 30% of cells. Similarly, differentiated human ES cells expressing green fluorescent protein from an insulin promoter did not show fluorescence above background (*9*). Moreover, the insulin-positive cells did not stain with an antibody for C-peptide, a byproduct of de novo insulin synthesis. Nuclei of insulin-staining cells were small, condensed, and TUNEL+, suggesting apoptosis (Fig. 1, A to D). Electron microscopy of differentiated cells failed to demonstrate the granules characteristic of β cells.

Differentiated insulin-positive cells were reported to contain 1 μg of insulin per mg of total protein (*1*). This is less than 0.02% of the insulin found in the media to which these cells are exposed, raising the possibility that insulin is concentrated from the medium. ES cells differentiated in media without exogenous insulin did not stain for insulin, and differentiated ES cells subsequently cultured in insulin-deficient media lost insulin staining. (This release of absorbed insulin may mimic genuine secretion.) Some absorbed insulin is retained for more than 3 weeks in insulin-deficient media. Therefore, the mere persistence of insulin immunoreactivity in a transplant of ES cell progeny is insufficient evidence of β cell differentiation or function.

ES cells differentiated in the presence of fluorescein isothiocyanate (FITC)–conjugated insulin concentrate FITC-insulin in the cells that stain with antibody to insulin (Fig. 1, E and F). When medium is supplemented with FITC-conjugated albumin, a distinct cell population concentrates this protein. Cells unrelated to β cells also concentrate insulin: Murine embryonic fibroblasts grown in the N2-based media used in the five-stage protocol (*1*) or in medium used to culture human embryoid bodies (*2*) produce cells with TUNEL+ nuclei that are insulin immunoreactive.

We cannot exclude the possibility that the paucity of β cell differentiation in these cultures is due to cell line variability or suboptimal culture conditions. We do conclude that insulin staining alone can overestimate genuine β cell differentiation when exogenous insulin is present. Furthermore, RT-PCR cannot quantify the number of cells within a population that produce insulin transcripts. Several methods should be combined for reliable analysis of insulin-expression including C-peptide staining, electron microscopy, Northern analysis, in situ hybridization, metabolic labeling, demonstration of biphasic insulin secretion, and transplantation assays for β cell function that demonstrate rescue of the diabetic phenotype for more than a month.

Fig. 1. Confocal images of insulin staining in mouse ES cell progeny. (**A**) Insulin staining (red). The inset demonstrates a typical aggregate of insulin-staining cells. (**B**) TUNEL+ nuclei (green). (**C**) Nuclear staining with DAPI (purple). (**D**) Composite image of (**A**) to (**C**). Cells that stain for insulin have condensed nuclei and are TUNEL+ (arrows). Cells with normal nuclei are TUNEL− and do not stain for insulin (arrowheads). (**E** and **F**) Insulin-staining cells (red) (**E**) are identical to cells that have taken up FITC-conjugated insulin (green) (**F**). Controls showed no leakage of the FITC or rhodamine signals. Scale bars, 20 μm.

References and Notes

1. N. Lumelsky *et al.*, *Science* **292**, 1389 (2001).
2. S. Assady *et al.*, *Diabetes* **50**, 1691 (2001).
3. S. Soria *et al.*, *Diabetes* **49**, 157 (2001).
4. A. Shiroi *et al.*, *Stem Cells* **20**, 284 (2002).
5. Y. Hori *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **99**, 16105 (2002).
6. V. K. Ramiya *et al.*, *Nature Med.* **6**, 278 (2000).
7. S. Bonner-Weir *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **97**, 7999 (2000).
8. H. Zulewski *et al.*, *Diabetes* **50**, 521 (2001).
9. N. Bonnevie, G. Yanuka, personal communication.

10. We thank N. Lumelsky and R. McKay for help in reproducing their culture regimen (*1*) and for comments on the manuscript. We thank R. Perak, N. Bonnevie, and the Melton lab. The following individuals kindly provided reagents: C. Wright (R1 Pdx1-lacZ ES cells), O. Bozzini (Isl2-lacZ ES cells), A. McMahon (Ax1 ES cells), R. McKay (nestin antibody, 174.1 ES cells), and J. Itskovitz-Eldor (rtTA human ES cells). A detailed protocol is available upon request.

Supporting Online Material

www.sciencemag.org/cgi/content/full/299/5603/363/DC1

Methods and Materials

Fig. S1

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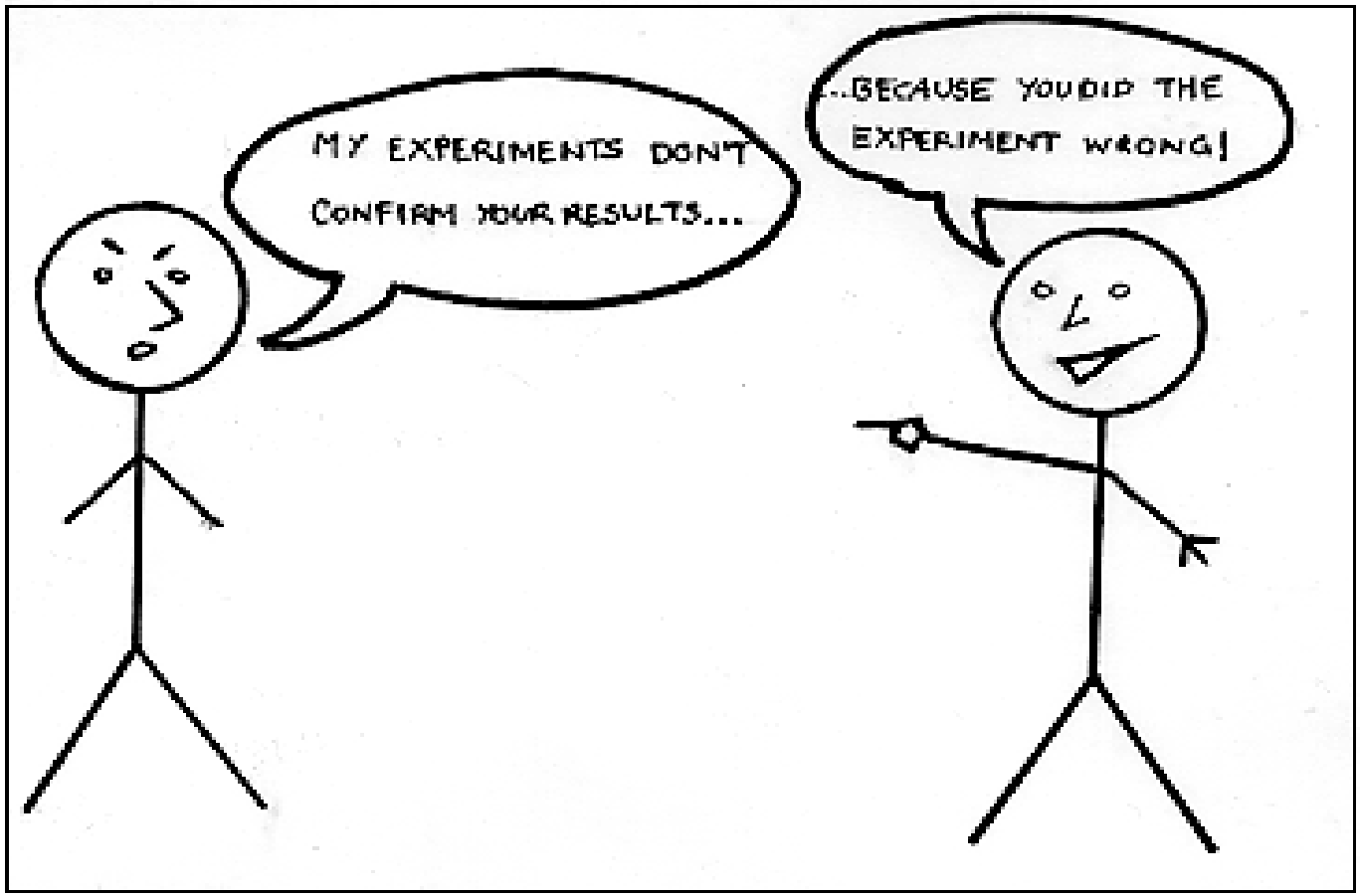
Lumelsky et al, 2001; Rajagopal et al, 2003

Core Set: Contested Science in Action



A lot of people have used the **'shake and bake'** approach. They're now learning how to do the molecular approach. (Scientist 25, USA)

Prof Harry Collins, Web; Michael et al (2007) *Science Studies*

Sociology of Expectations & Translational Research

(Williams et al, 2003, *SHI*; Kitzinger et al, 2005, *SSM*)

Over the coming years we intend to accelerate the rate at which MRC research is translated into new methods of diagnosis and treatment – a process that can take anything from a few years to decades… to bring our knowledge and discoveries into the healthcare system and so to patients.
(Colin Blakemore, MRC, 2004: 1)

Problems: Wainwright et al (2006) *Social Science & Medicine*

- Can hES cells be turned into functioning cells?
- Different cultures of medicine and science

Clinical use of 'cardiac stem cells'
'Third rate scientists misled by bad data' (Scientist 27, USA)

From Bench to Bedside? The Two Cultures Revisited

Science versus Medicine

Bench scientists tend not to talk to, or respect, true clinical scientists and vice versa, and there are very few people that cross over truly between the two… If you talk to most basic scientists they will say that clinical research is very 'Mickey Mouse' and if you talk to most clinical scientists I guess they will say that most basic science is a waste of time and money. Scientist 3

Problems with animal studies

I think there are two very clear groups of researchers, those who have done a lot of animal work, who very rarely do anything in humans, and then there are a group who say, 'working on mice is a waste of time!' Quite often what you find is that there isn't so much crossover. Scientist 5

Promoting interaction between 'the two cultures'

So there is a little bit of them providing us with tissue plus us experimenting with them and feeding them back information. Scientist 4

Wainwright et al (2006) *Social Science & Medicine*

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Bourdieu: Key Concepts

(Habitus + Capital) + Field = Practice (Bourdieu, 1984: 101)

Field: a structured system of social positions of power

Habitus: 'a feel for the game'; 'When habitus encounters a social world of which it is the product, it is like a "fish in water"'(B&W, 1992: 127)

***Illusio*:** 'is the game worth the candle'

Forms of Capital:

Physical Capital	the body
Emotional Capital	emotions
Economic Capital	money etc
Symbolic Capital	prestige; recognition of economic / cultural capital
Social Capital	relations with 'significant others'
Cultural Capital	legitimate knowledge

Scientific Capital? Economic, Symbolic, Social & Cultural Capitals **+ Ethical Capital + Expectational Capital?**

Wainwright et al, *SHI,* 2008

Bourdieu - *King's Health Schools Review 2005-2006*

There is an enormous amount to celebrate in this Review of 2005-6. I can honestly say that I have never lived through such a period of accelerated progress. The most recent success resulted from the Department of Health's competition for Biomedical Research Centres as part of the 'Best Research for Best Health' initiative.

Success breeds success

A total of five comprehensive Centres were awarded to partnerships between NHS Trusts and their academic partners within the UK. The Guy's and St Thomas' NHS Foundation Trust was one of the winners in this competition based on the strength of translational research that has grown up within the Health Schools of King's. Indeed, ours was the only Centre to be funded in full. In addition, the South London and Maudsley NHS Foundation Trust with the

types of Centre. This is a telling endorsement of the position that we have achieved in UK biomedicine and reflects progress in numerous domains. First, we have enjoyed unparalleled success in the recruitment of Professorial level clinical and non-clinical scientists of international repute across a broad range of disciplines. Thus far we have made sixteen new Chair appointments, with a further eight in train. Second, we have taken steps to improve the infrastructure

awarded a fifth MRC Centre, in translational research in the field of Transplantation [illegible] university with the largest number of such Centres. King's is now fourth in the UK for MRC income, and enjoys a strategic partnership with the MRC. We were also successful in the recent competition for Wellcome Trust, Wolfson, and Department of Health funding for Clinical Research Facilities: a sum of £9.5 million has been made available to establish a facility on the King's Denmark Hill Campus. The major focus of this facility will be on novel interventions in mental health, but it will also incorporate several applications of cell therapy. In addition, Tate & Lyle have invested £4.5 million in a Centre for Nutrition and Health based at the Waterloo and St Thomas' Campuses and the Guy's and St Thomas' Charity have provided close to £3 million to fund an experimental facility on the Guy's Campus.

Several major collaborative grants have also been won, including a capacity building grant of £3 million in integrative physiology from a consortium of funders led by the BBSRC, and an ESRC Centre for Evidence Based Policy and Practice directed from the Florence Nightingale School of Nursing & Midwifery.

A fifth and final area of progress has been in the continuing development of close working partnerships with our major NHS partners, at Guy's and St Thomas', King's College Hospital and South London and The Maudsley Trusts, all of which now have Foundation Trust status. These partnerships are essential if we are to realise our ambition to prosecute complete research pathways from basic discovery to first in man studies, clinical trials and health services research.

All the successes outlined above have established a strong platform on which to build during the next few years. Now that we have a platform, the challenge that confronts us is that of delivering high quality research across the whole span of biomedicine. In this

[illegible] research centres. The ambition is to create new linkages between the major academic institutions, their NHS partners, and industry to foster high quality research innovation and, ultimately, patient benefit.

Another key aspect of our mission is to teach and to train and there have been many successes here too. Recruitment to undergraduate clinical and basic science courses remains very strong. King's continues to be the most popular choice for undergraduate medicine and dentistry in the UK, as judged by the number of applications. King's widening participation Extended Medical Degree Programme – which will see its first graduates in 2007 – and fast-track graduate entry programmes in medicine continue to thrive. King's also offers a unique range of health-related professional degrees in dentistry, nursing, dietetics, physiotherapy and pharmacy, each of which is linked to strong discipline-based research programmes. In keeping with the rise in our research standing, it is important that we are a breeding ground for leading biomedical researchers of the future. We are in the process of establishing a clearly set out postgraduate training pathway for medical graduates aspiring to become clinician scientists, starting with the Academic Foundation Programme, through academic clinical fellowships, PhD programmes and on to Lecturer posts. For basic scientists, we have been steadily increasing the numbers of PhD studentships, now under the King's Graduate School umbrella.

There is much yet to be achieved. However, the last two years have witnessed a rate of progress that it has been a privilege to be associated with. Long may it continue!

Scientific capital / economic capital / symbolic capital are interrelated -

HEFC funding, Research Council Grants, RAE scores, league tables etc

Bourdieu - *King's Health Schools Review 2005-2006*

'There's London, Oxford & Cambridge, and then it's a desert until you reach Edinburgh!' **(Scientist 13, UK FRS)**

The Field of Diabetes - 'A world without insulin' (*JDRF*) Backing Scientific Winners & Making Beta Cells?

Time & Place
Expectations,
Science & Society

Strategy 1 - 2001

Strategy 2 - 2003

Strategy 3 - 2005

Feel for the game?

Is the game worth it?

β Cell Stakes

Name:

(Circle only one number)

RUNNERS

1. **Isolated** Islets from Cadaver Pancreas
2. **Stem** Cells Embryonic
3. **Stem** Cells Pancreatic Duct
4. **Stem** Cells Blood
5. **Stem** Cells Liver
6. **Stem** Cells Intestine
7. **Cultured** Foetal/Neonatal Pancreas
8. **Nuclear** Transfer Techniques
9. **Cultured** Tumour Cell Lines
10. **Encapsulated** Cells
11. **Xenograft** Cells
12. **Direct** Gene Therapy
    e.g. Single Chain Insulin Analogue
13. **Engineered** Intestinal K Cells
14. Dark Horse **IPS cells**

Prof Sir Roy Calne, Singapore, 2001

The fields of ES cells and diabetes revisited: are cell transplants the answer for Type-1 Diabetes?

(i) Islet transplants: '*unlimited* stem cells' needed?

(ii) Immunology: *any* cells needed for Type-1?

(iii) Diabetes industry: innovative insulin pump therapies?

(iv) hESC research: 'disease in a dish'?

Do islet transplants only function short-term?

Diabetes UK: *Should focus be on Type-2 Diabetes?*

Wainwright & Williams, *NGS,* 2008; and Wainwright et al, *SHI,* 2008

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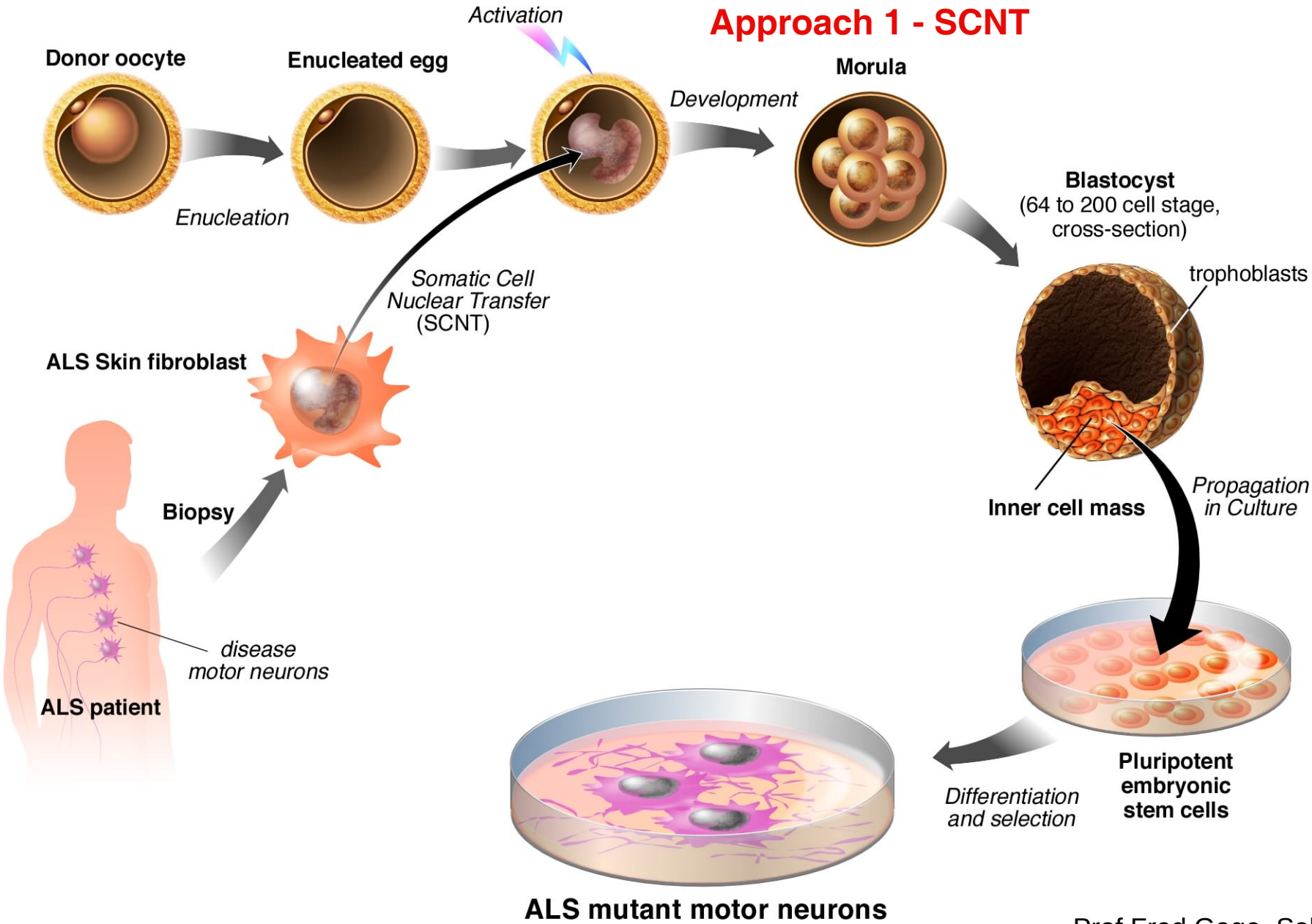
hESC Research: From Tx to 'Disease in a Dish'?

Stem cells have been, over the last two or three years, sold to the public as a potential therapeutic applications for transplantation, almost explicitly, and it is the simplest way to think about it… When are we first going to see the real cure, when are the benefits going to be in the clinic? Is it going to be diabetes, is it going to Parkinson's Disease? And I think some opportunists have jumped into this field, done some rat studies with human ES cells and some changes occurred. I think that people were shaken and some scientists started backing off and saying it's all hype. There are no real cures in this domain… For the last year or so I've been talking about how you can study 'diseases in a dish' through cell culture. This is a revolution in human biology. This is a paradigm shift… This is going to happen. It's too clear. It's too right. (Scientist 29, USA)

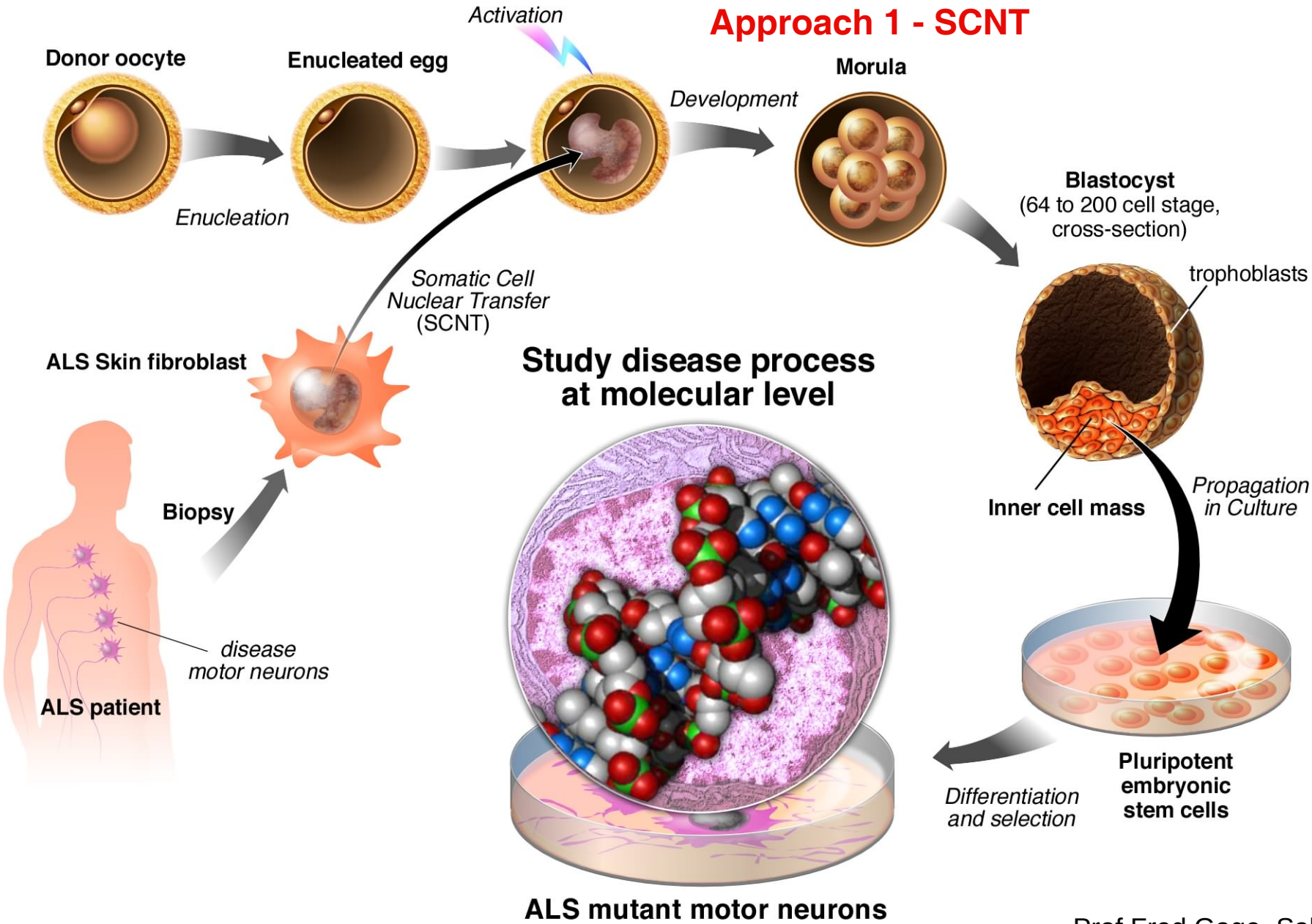
Wainwright et al, *SHI,* 2008

hES Cell Therapy: Cellular & Molecular Mechanisms of Disease



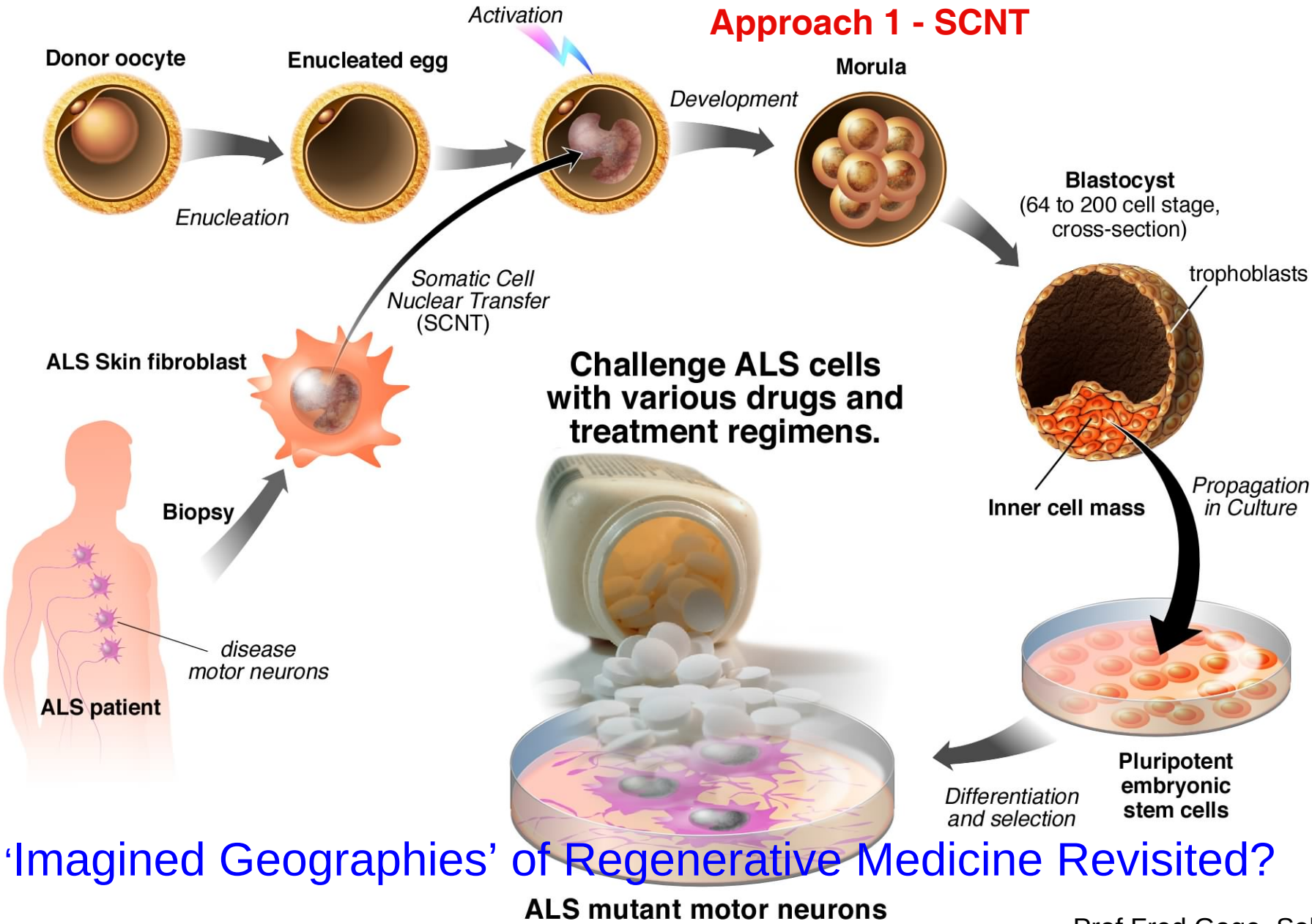
Prof Fred Gage, Salk

hES Cell Therapy: Cellular & Molecular Mechanisms of Disease



Prof Fred Gage, Salk

hES Cell Therapy: Cellular & Molecular Mechanisms of Disease

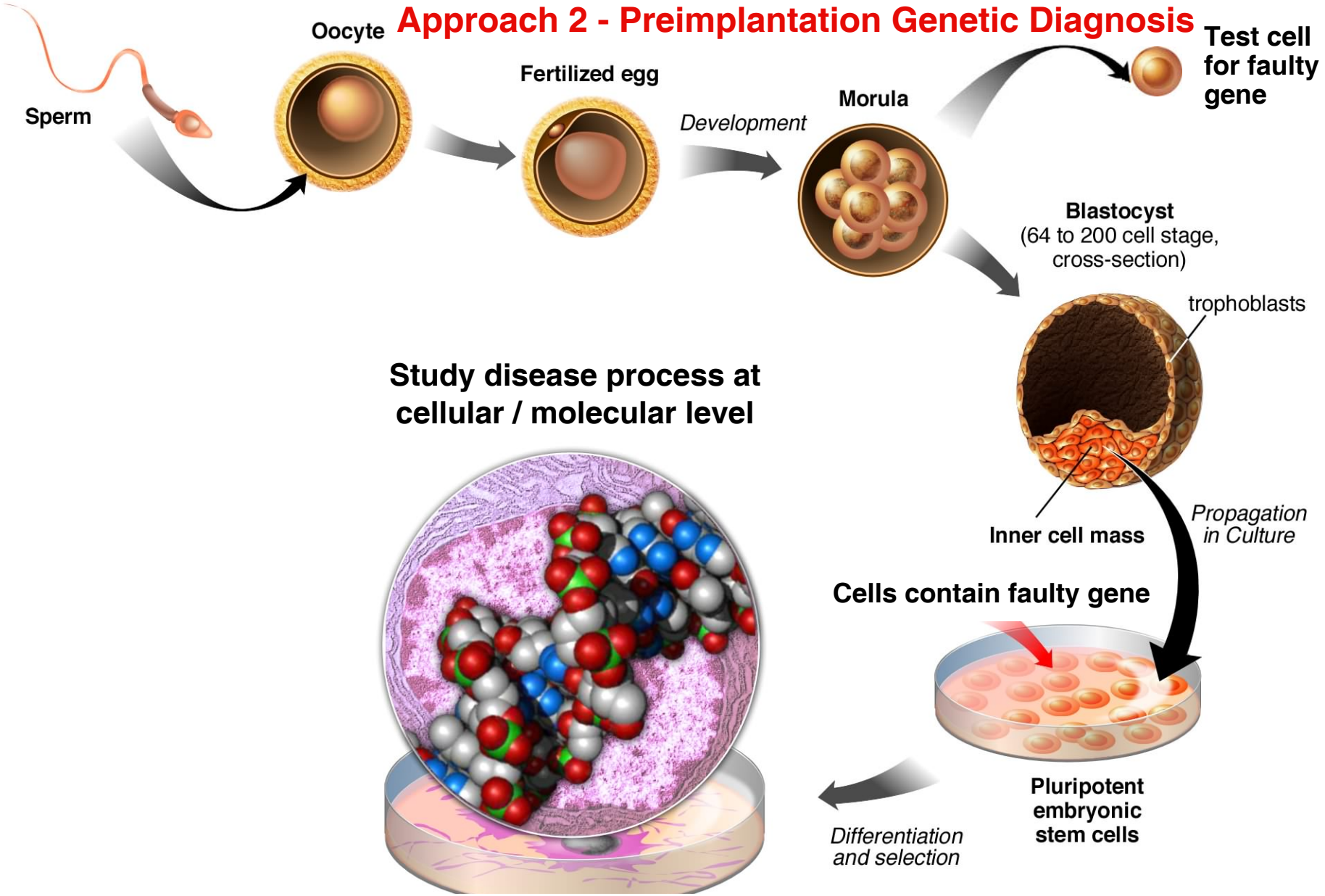


'Imagined Geographies' of Regenerative Medicine Revisited?

Prof Fred Gage, Salk

Human ES Cells: Studying the Cellular and Molecular Mechanisms of Disease

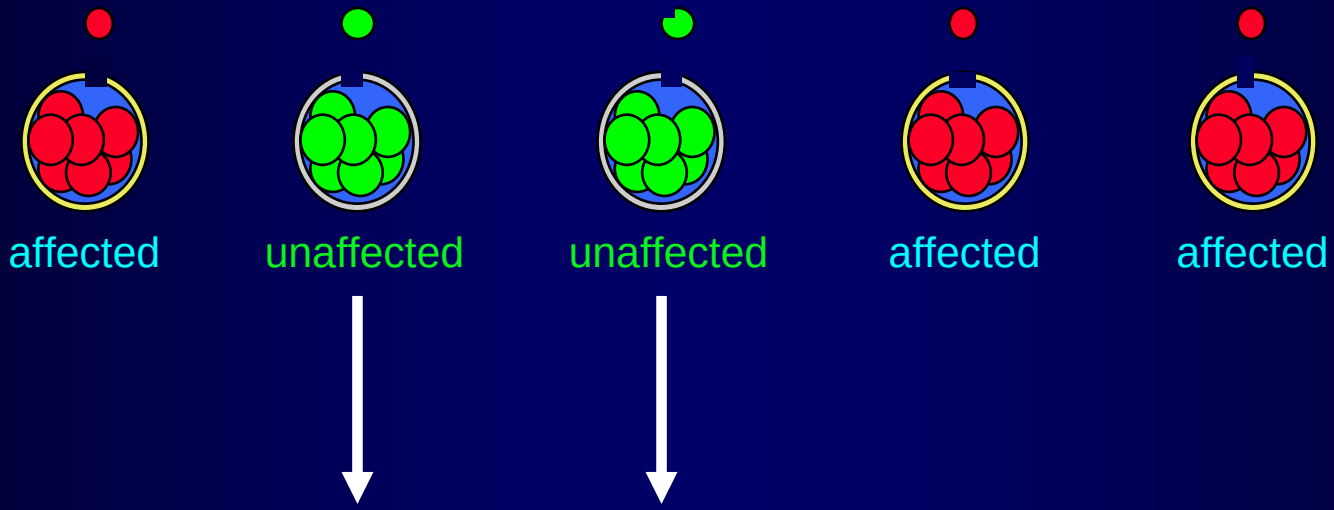
Approach 2 - Preimplantation Genetic Diagnosis



Modified from original courtesy of Dr Fred Gage

J. Simon '04

Pre-implantation Genetic Diagnosis (PGD): Making Healthy Babies?

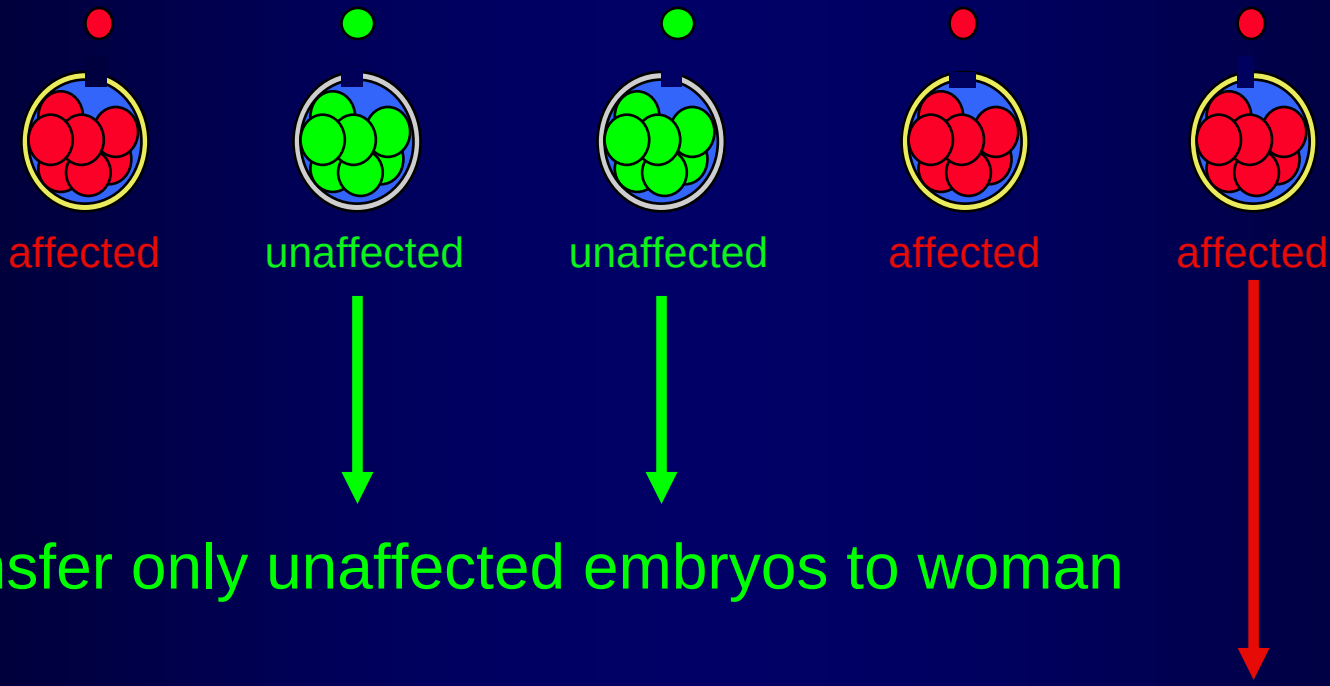


Transfer only unaffected embryos to woman

Pre-implantation Genetic Diagnosis (PGD): Making Healthy Babies & Creating 'Disease in a Dish'?

PGD lines could be very important… stem cells for therapy… This is a potential source to study genetic conditions. You could actually look through the very early stages where the genes switch on. What actually happens? Can you change it? Could it be a pharmaceutical target?

PGD Clinician/Scientist 16



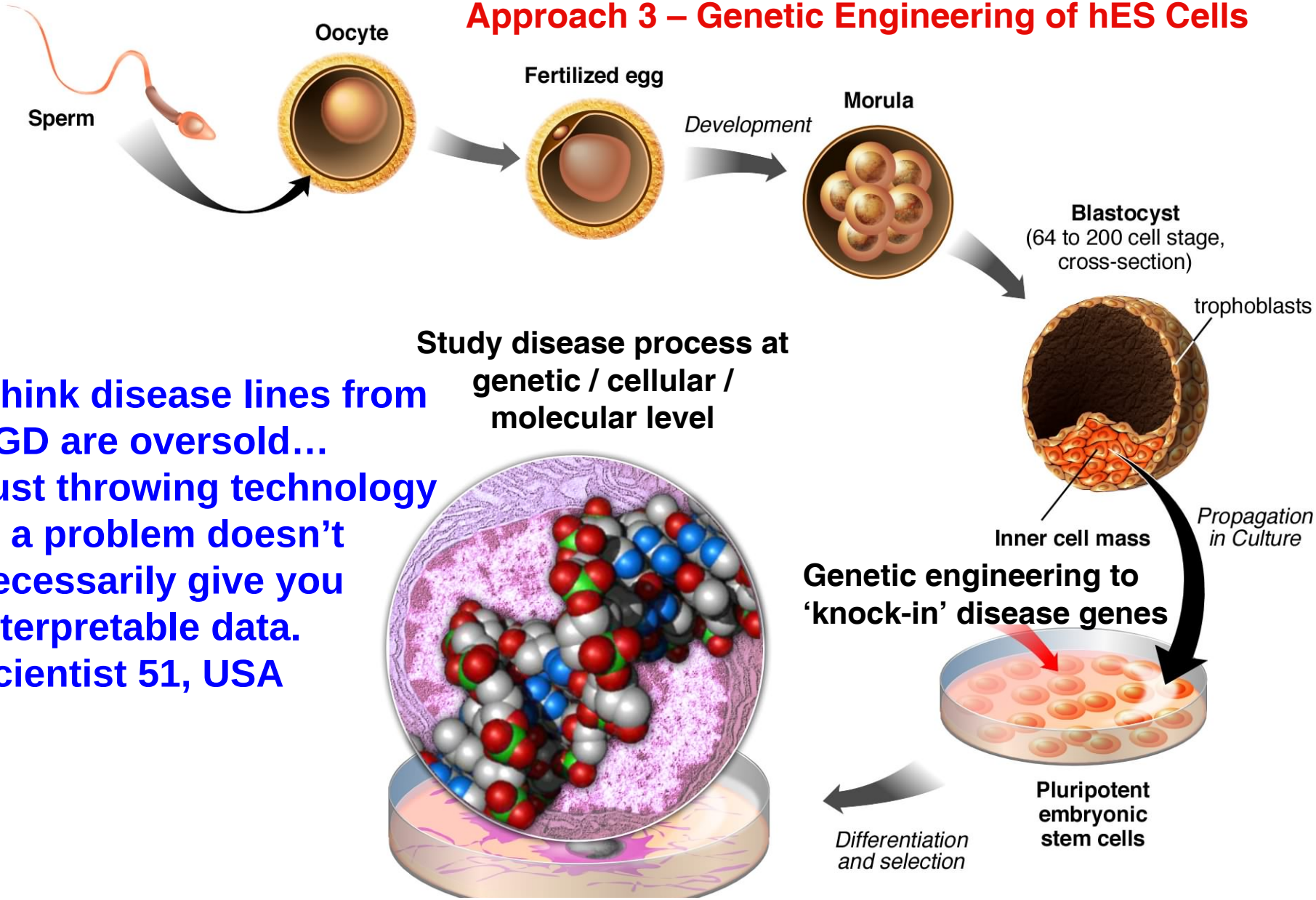
Transfer only unaffected embryos to woman

Create 'disease in a dish' hES cell lines with genetic mutation

Williams et al (2008) *New Genetics & Society*

Human ES Cells: Studying the Cellular and Molecular Mechanisms of Disease

Approach 3 – Genetic Engineering of hES Cells



I think disease lines from PGD are oversold… Just throwing technology at a problem doesn't necessarily give you interpretable data.
Scientist 51, USA

Study disease process at genetic / cellular / molecular level

Genetic engineering to 'knock-in' disease genes

hES Cells with genetic mutation

Modified from original courtesy of Dr Fred Gage

J. Simon '14

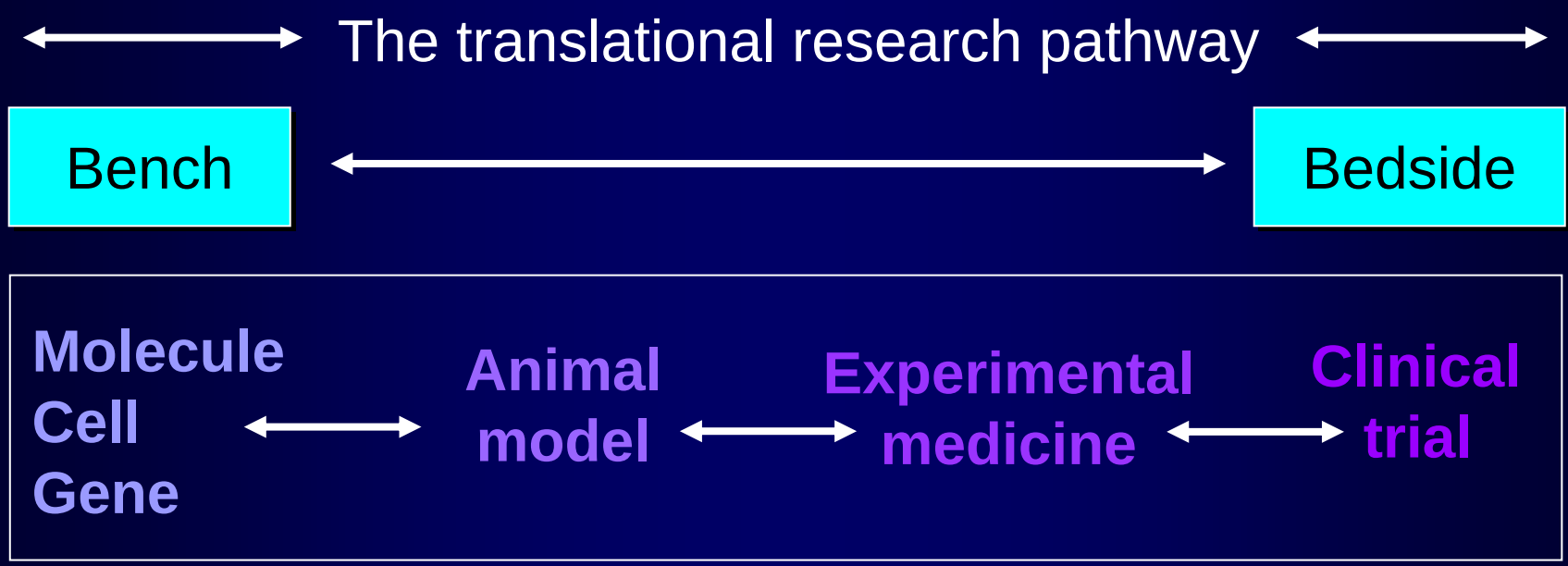
Outline

1. Introduction: CBAS, sociology and translational research
2. Prospects of hES cells as a cure for diabetes
3. Bourdieu and the fields of science and medicine
4. From cell transplant to disease in a dish?
5. Conclusion: translational research revisited

Sociology of ‘ES Stem Cell Translational Research’

1. Media & Ethics	*Sociology of Health & Illness*
2. Media & Expectations	*Social Science & Medicine*
3. Core Set	*Science Studies*
4. Epistemic Things	*Configurations*
5. Scientific Realism	*Social Theory & Health*
6. Translational Bioethics	*Medicine, Healthcare & Philosophy*
7. Cell Tx for PD (‘PUS’)	*British Journal of Neuroscience Nursing*
8. Ethical Boundary-Work	*Sociology of Health & Illness*
9. Boundary Objects	*New Genetics & Society*
10. Expectations	*Social Science & Medicine*
11. Boundary-Work	*New Genetics & Society*
12. Geography of Science	*New Genetics & Society*
13. Expectational Capital	*Sociology of Health & Illness*
14. STS & Bourdieu	*Handbook of Genetics & Society* (Book)
15. Sociology & Ethics	*Bioethics & Stem Cells* (Book)

From Bench to Bedside? The struggle for Power in the Fields of Science & Medicine



Scientific capital ---------- Clinical capital

Rigour ---------- Relevance

If I'm not prepared to do something, someone else will do it. There's someone right behind me, who's going to clamber over my back, prepared to do that. There is great pressure on individuals and institutions to 'push ahead'. *Surgeon 32.*

Wainwright et al (2009) *Handbook of Genetics & Society*

wellcome trust

Biomedical Ethics Strategic Award

LABTEC - London & Brighton Translational Ethics Centre (2009-2014)

The ethics of translational research: from 'unnatural entities' to experimental treatments

Prof Williams (King's, Sociology, CBAS)
Prof Braude (King's, Medicine)
Prof Cribb (King's, Ethics, SSPP)
Prof Farsides (Brighton & Sussex, Ethics)
Prof Michael (Goldsmiths, Sociology)
Dr Minger (King's, Stem Cell Science)
Prof Salter (King's, Politics, CBAS)
Prof Scott (King's, Ethics & Law, Law)
Prof Seale (QMUL, Sociology)
Prof Shaw (King's, Neuroscience, IOP)
Prof Wainwright (King's, Sociology, CBAS)

- Significant contribution to empirical /normative ethics
- Esteemed interdisciplinary research programme
- Develop research capacity and expertise
- Build local, national, and international collaborations
- Engage with policy makers, users and publics
- Contribute to public debates and the policy process

King's College London
University of London

brighton and sussex medical school

Goldsmiths University of London

Queen Mary University of London

CBAS Centre for Biomedicine & Society

Ethics of translational research

Interface between research ethics / experimental treatment ethics

Two major themes

- Human animal hybrids (admixed embryos) and IPS cells
- Experimental neuroscience (PD & MND)

Four perspectives

- Scientists', clinicians' views
- Stakeholders' views (law, policy, regulation)
- Patients' perceptions
- Media reporting

Wainwright & Williams (in press) *Bioethics & Stem Cells*

Summary: Challenges for Stem Cell Translation

- What counts as translation?
- Basic versus applied science?
- What sort of stem cells?
- Is IPS a problematic panacea?
- Cell therapy and/or pharmacological tool?
- What timescale?
- Will competing approaches / technologies win out?
- What role should social science play?

Questioning Translation: The Politics of the Future

- Biotechnology and genomics marked by constant (re)creation of ‘regimes of hope’
- Role of social scientists and bioethicists in the co-production of biofutures? e.g. ESRC SCI projects
- What principles and values should be adopted? Danger of ‘going native’?
- Should social scientists be involved in creating alternative discourses eg about resource allocation, production of health, health inequalities [what counts as translation] etc?

What Counts as ‘Translational Research’?
1. Better Science --> 2. Improved Health

What is a drug?

A substance injected into a rat that produces a paper!

What is translational research?

A phrase used in a proposal that produces a grant!

Is biomedical science the best way to improve health?

1. The challenge from social science…
2. The challenge from geoscience…

What is Translational Research? The Future as the Key to the Present **OR** the Past as the Key to the Future