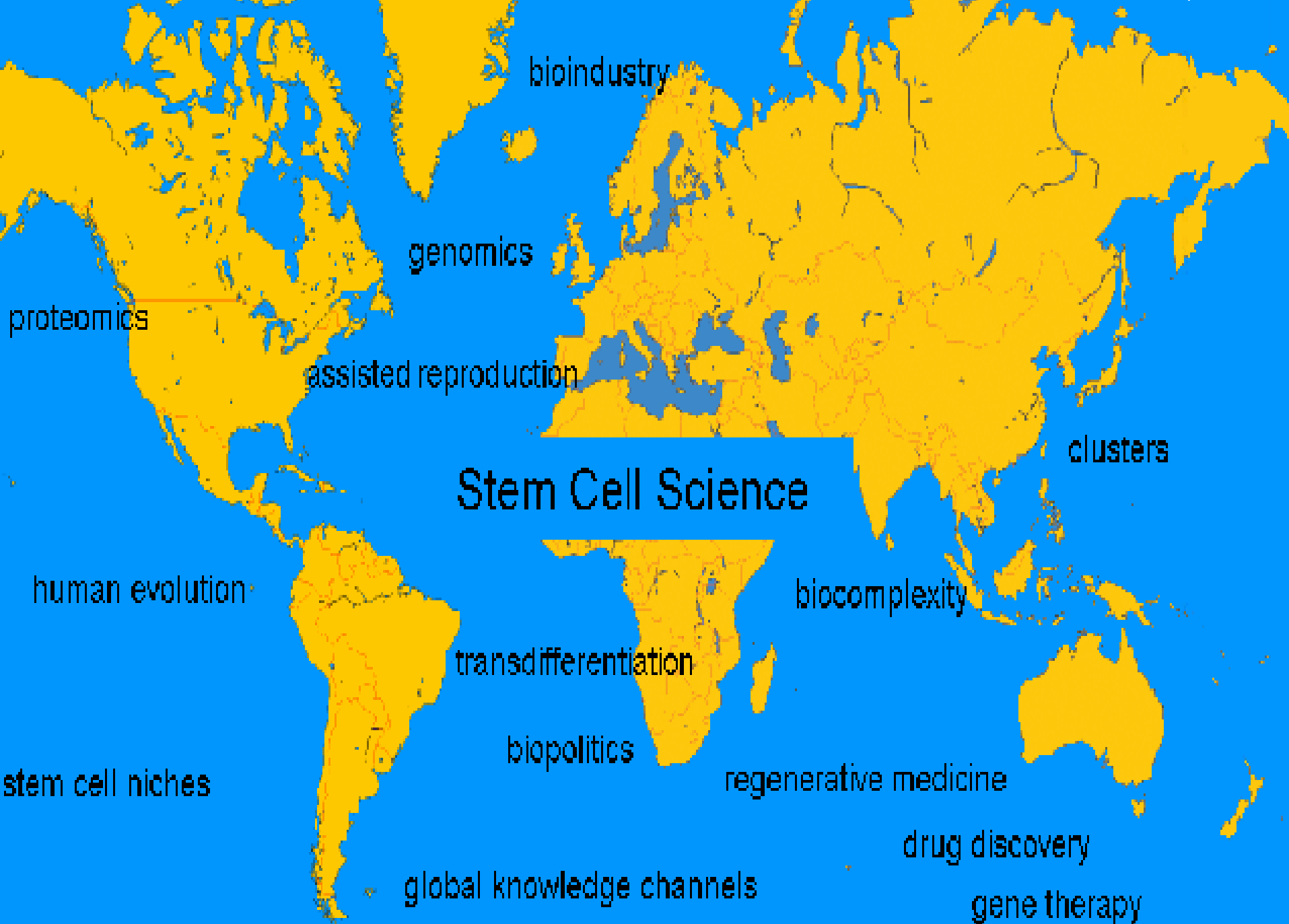


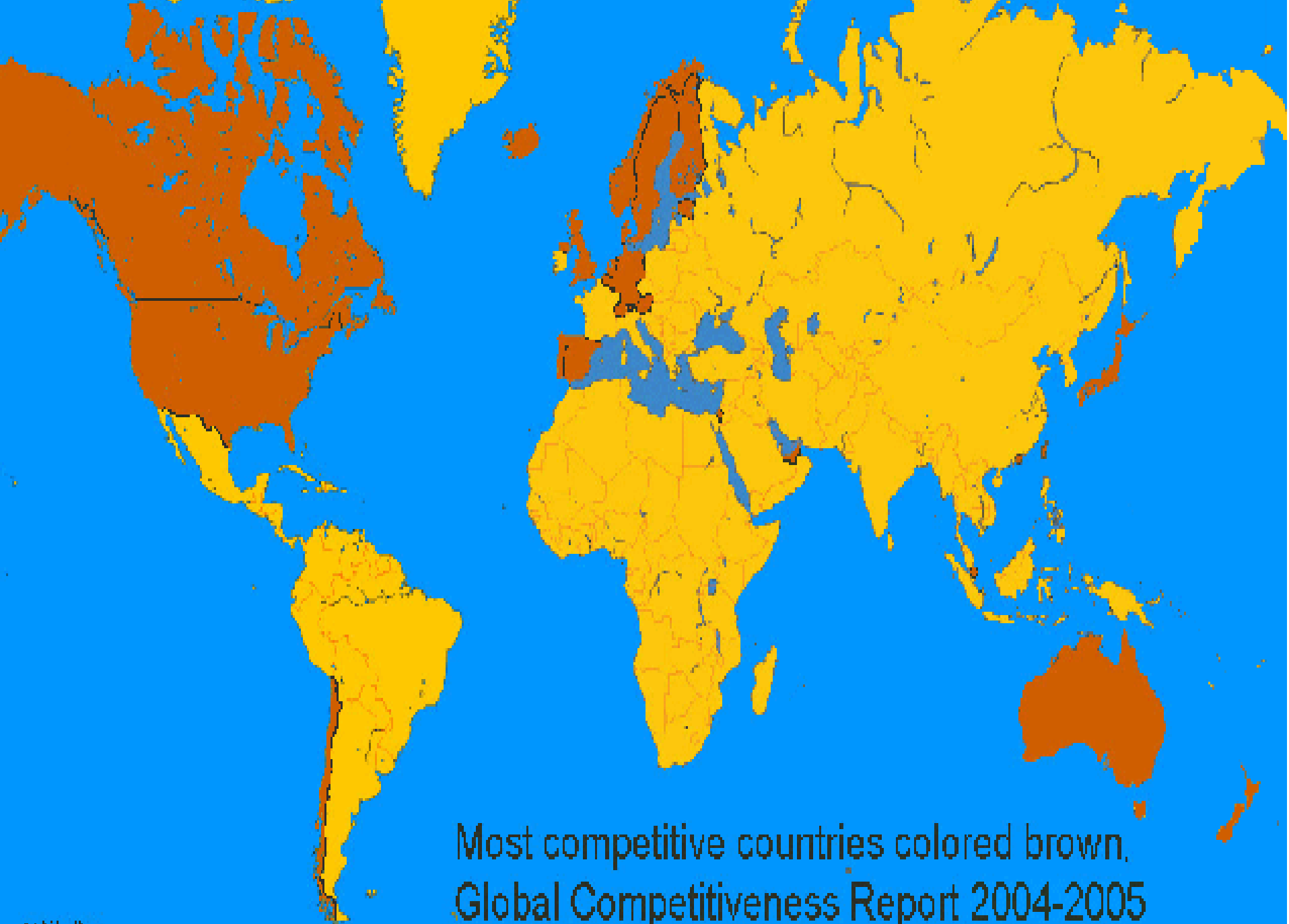
Stem Cell Science & Technology

Commercialization Opportunities & Challenges

**MIT Enterprise Forum
October 12, 2006**







Most competitive countries colored brown,
Global Competitiveness Report 2004-2005

Global comparisons



Source: William Hoffman, MBBNet
<http://mbbnet.umn.edu/scmap.html>

- Permissive policy: various ES cell derivation techniques allowed, including SCNT
- Flexible policy: stem cells may be derived from human embryos donated by fertility clinics only
- Restrictive policy or no established policy (which may mean any research is permitted)

United States

Federal restrictions on funding with ES cells

- Has limited stem cell research
- Recent indications that situation may begin to change

Range of State initiatives

- California: Proposition 71, \$3 bn fund for stem cell research
- NJ, MA, CT, WI & others also supporting research
- Minority of States have tightened restrictions

Active Companies

- E.g., Geron, ACT, Stem Cells, Inc., SERO/MIL and increasingly, others
- Significant resources and investment for commercialization

Europe

Diversity of ESC work and support

- Banned: Italy, Austria, Ireland
- Restrictions: Fr, Ger, Greece, Netherlands
- Permitted: UK, Belgium, Spain, Czech

Some highly-regarded adult SC research

UK highly focused and committed to leadership and commercial success (e.g., Stem Cell Sciences Plc.)

Active efforts to establish acceptable guidelines

Scandinavia

- Strong research, recognized expertise
- Government support
- Favorable legislation
- Clear routes for commercialization

Similar competitive strength of UK, especially in
Sweden and Denmark

EuroStemCell Partners

European consortium with mission to build the scientific foundation required to take stem cell technology successfully to the clinic.

Promoting collaboration and technology transfer

Members: 27 research groups across 11 academic centers and 3 companies in 8 European countries

England, Scotland, France, Germany, Denmark, Sweden, Italy, Switzerland

NeuroNova (Sweden), NsGene A/S (Denmark), Stem Cell Sciences (Scotland)

www.eurostemcell.org

Asia

- Seen as a priority area
- Significant government investment, supportive regulations, impressive infrastructure, world-class expertise

Main Focus

China

clinical translation

Singapore

commercial emphasis

.....Significant Competitive Threat!!

Other Significant Players

- Australia
 - Leading center of excellence
 - Uncertain regulatory framework
 - Appears to be losing strong position
- Canada
 - Canadian Stem Cell Network particularly strong
 - Research with surplus embryos allowed but therapeutic cloning banned
- Israel
 - Strong academic expertise
 - Therapeutic cloning permitted
 - Active spin-out companies

Commercial Opportunities

Research Applications

- Disease Models
- Drug Screening
- Toxicity Testing

Enabling Technologies

- Research Consumable
- Manufacturing
- Licensing Cell Lines

Cell Banking
Clinical Trials
Training

Therapeutics

- Growth Factors
- Cell Therapies

Stem cell markets

*Research products
& drug discovery*



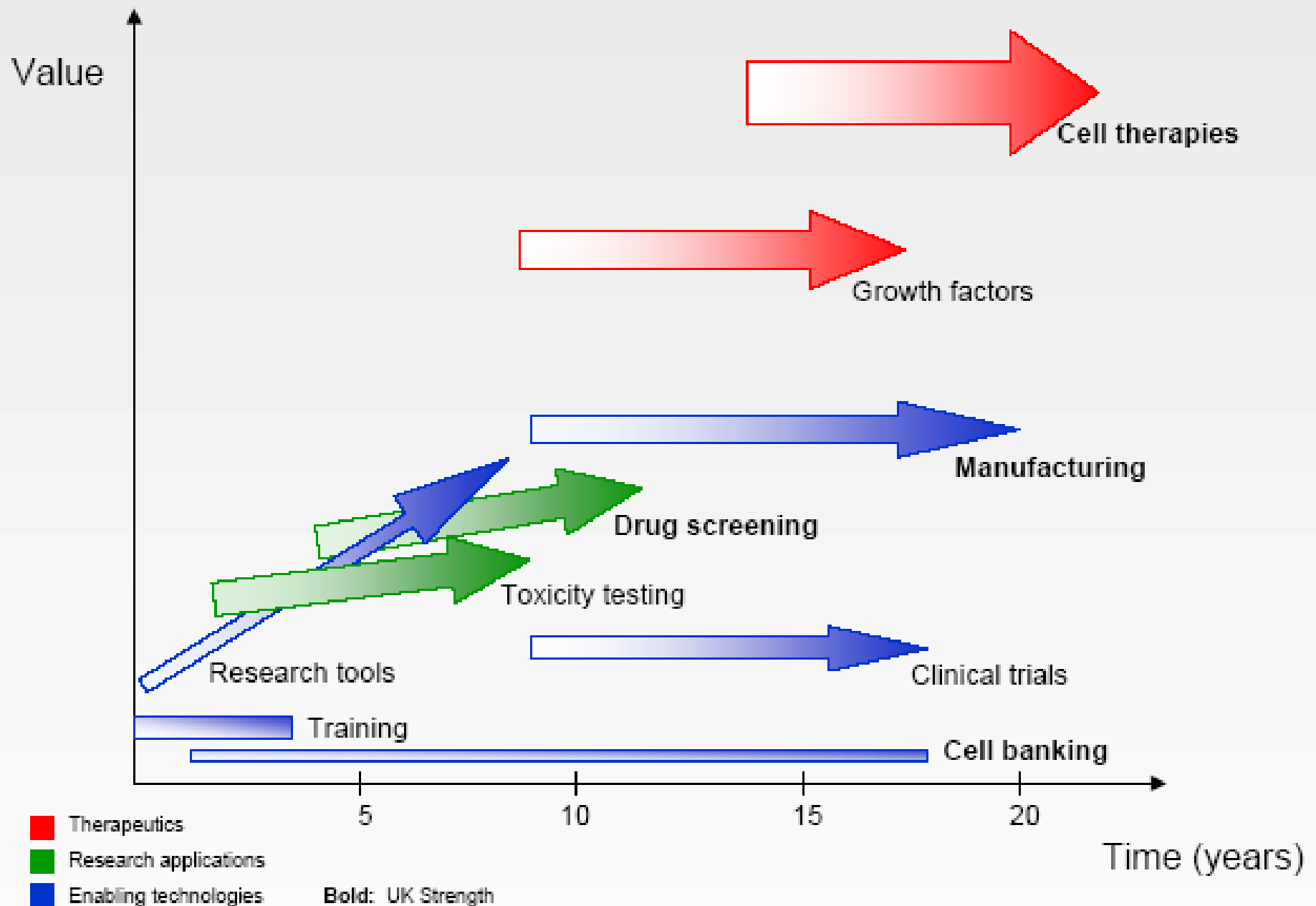
- Academic research
 - *expected >\$6BN new investment next 10 years in USA*
- Drug discovery / development
 - *US\$750M (2004) for cell based screening*
 - *growing 20% year on year*



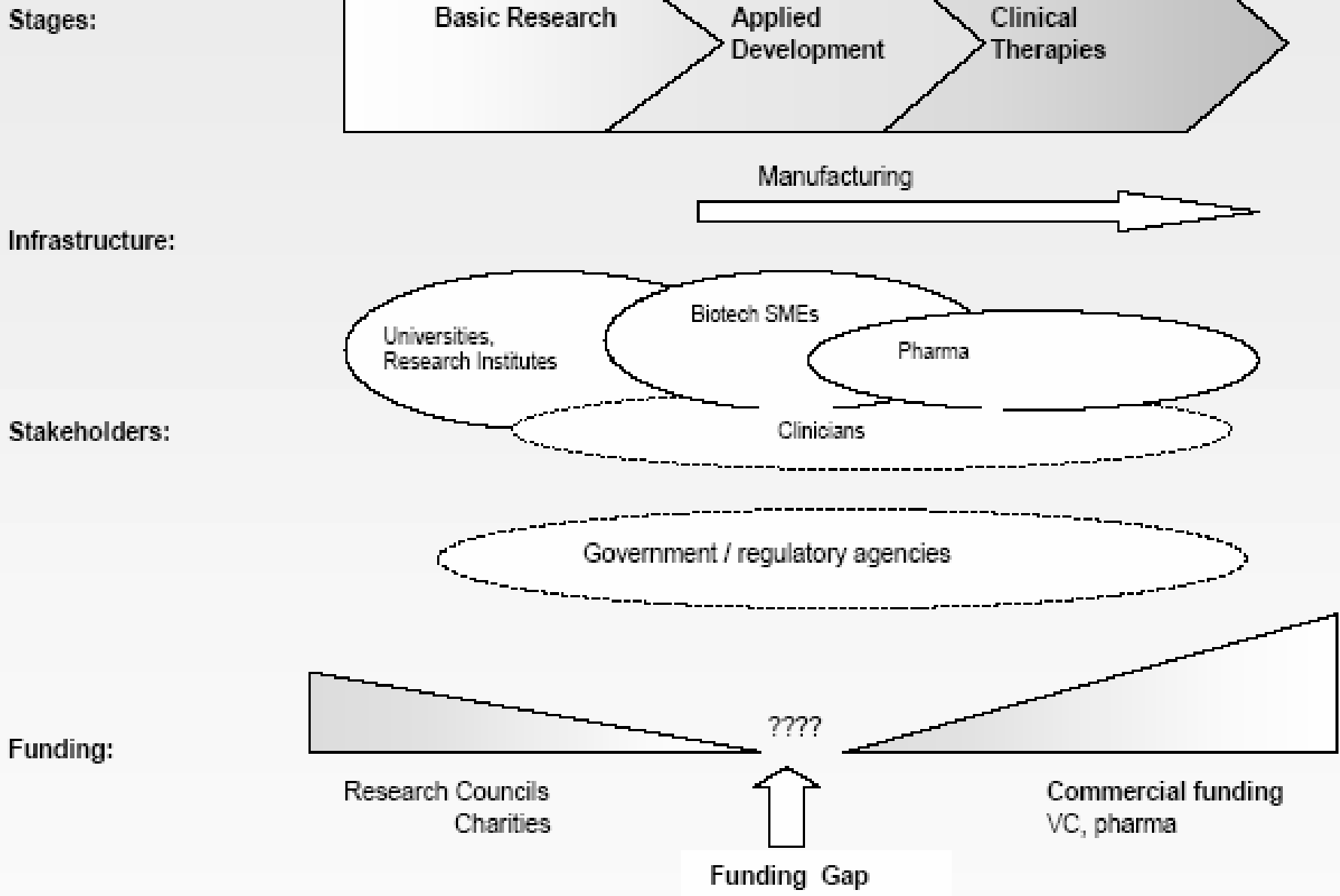
*Novel cell-based
therapeutics*

- Cell therapies
 - *reported US\$2.7BN (2001)*
 - *estimated US\$10BN (2013)*

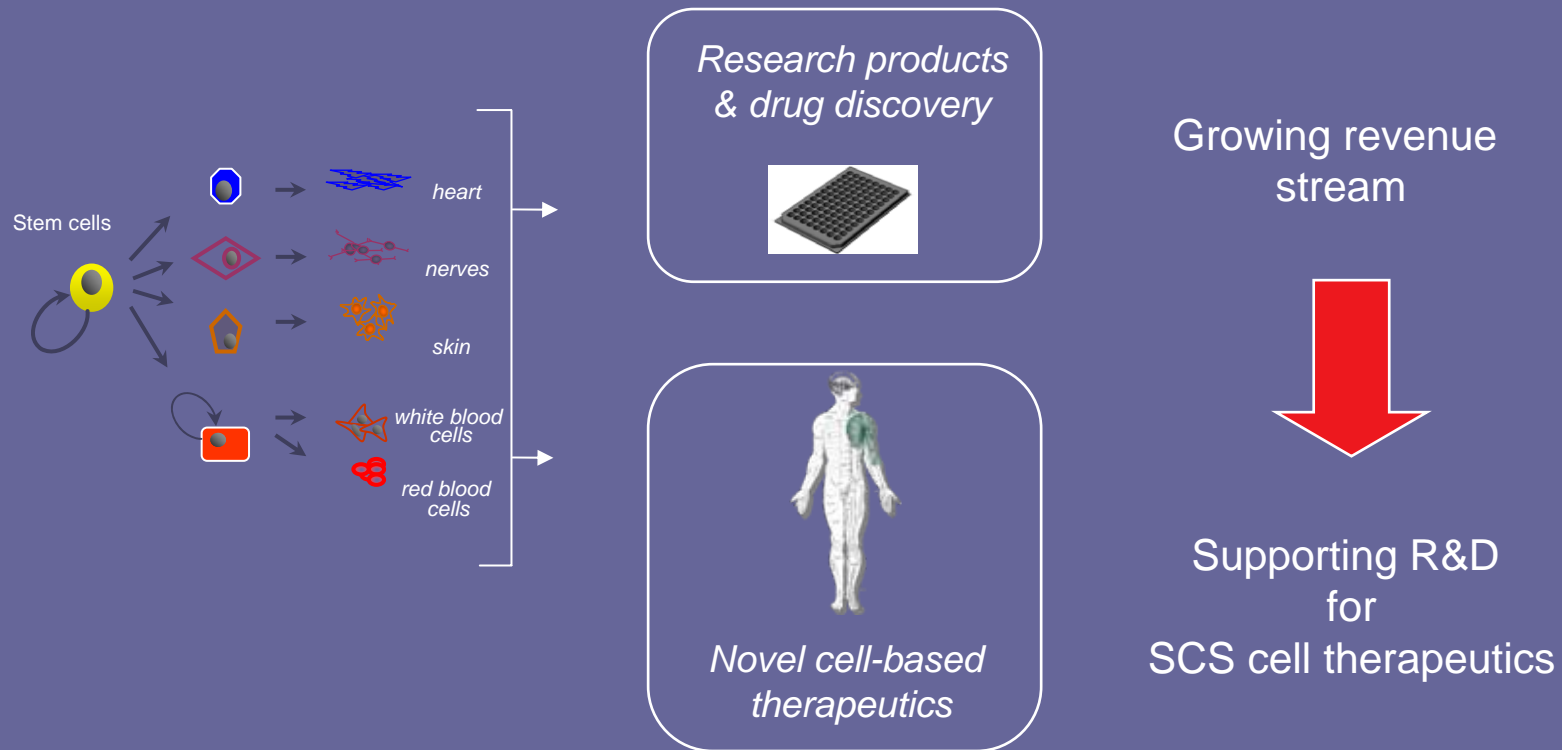
Timescale for commercial opportunities



Translation of stem cell research into commercial products



The SCS twin business model

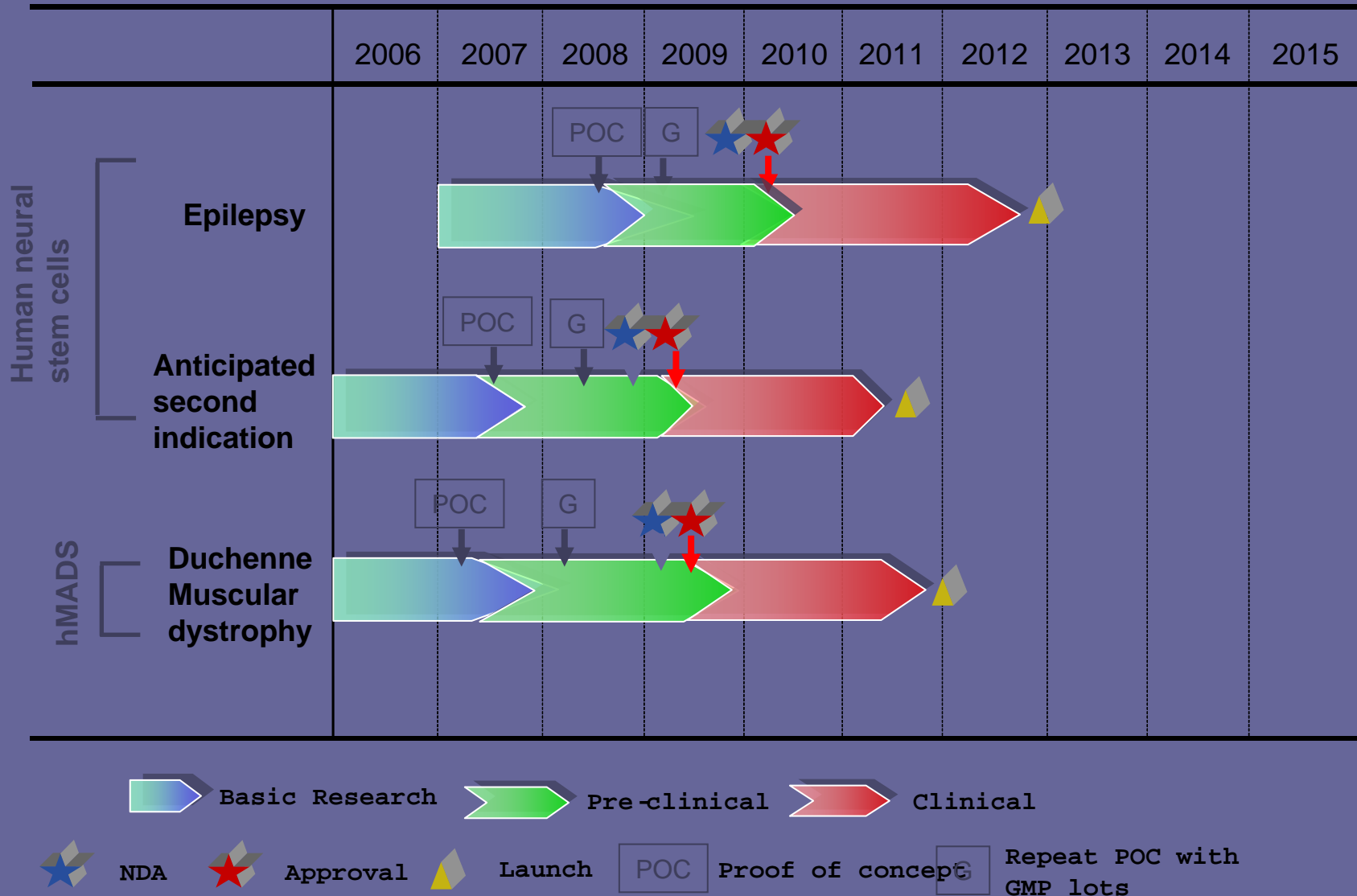


— Core competency —

— Two businesses —

— Business model —

Stem Cell Therapy



Challenges

- IP: lack of clarity
- Lack of significant venture capital investment
- Caution from Big Pharma
- Need for translational funding

Acknowledgements

- <http://mbbnet.umn.edu/scmap.html>
- “Global Commercialisation of UK Stem Cell Research,” Nicola Perrin, intern, UK Trade & Investment, 2005.
- Investor presentation, Stem Cell Science Plc.