

Høring om terapeutisk kloning og forskning i menneske
befrugtede æg og fosteranlæg. Christiansborg 30.11. 2005

Terapeutisk Kloning

(Somatic Cell Nuclear Transfer, Somatisk
Cellekerne Transplantation)

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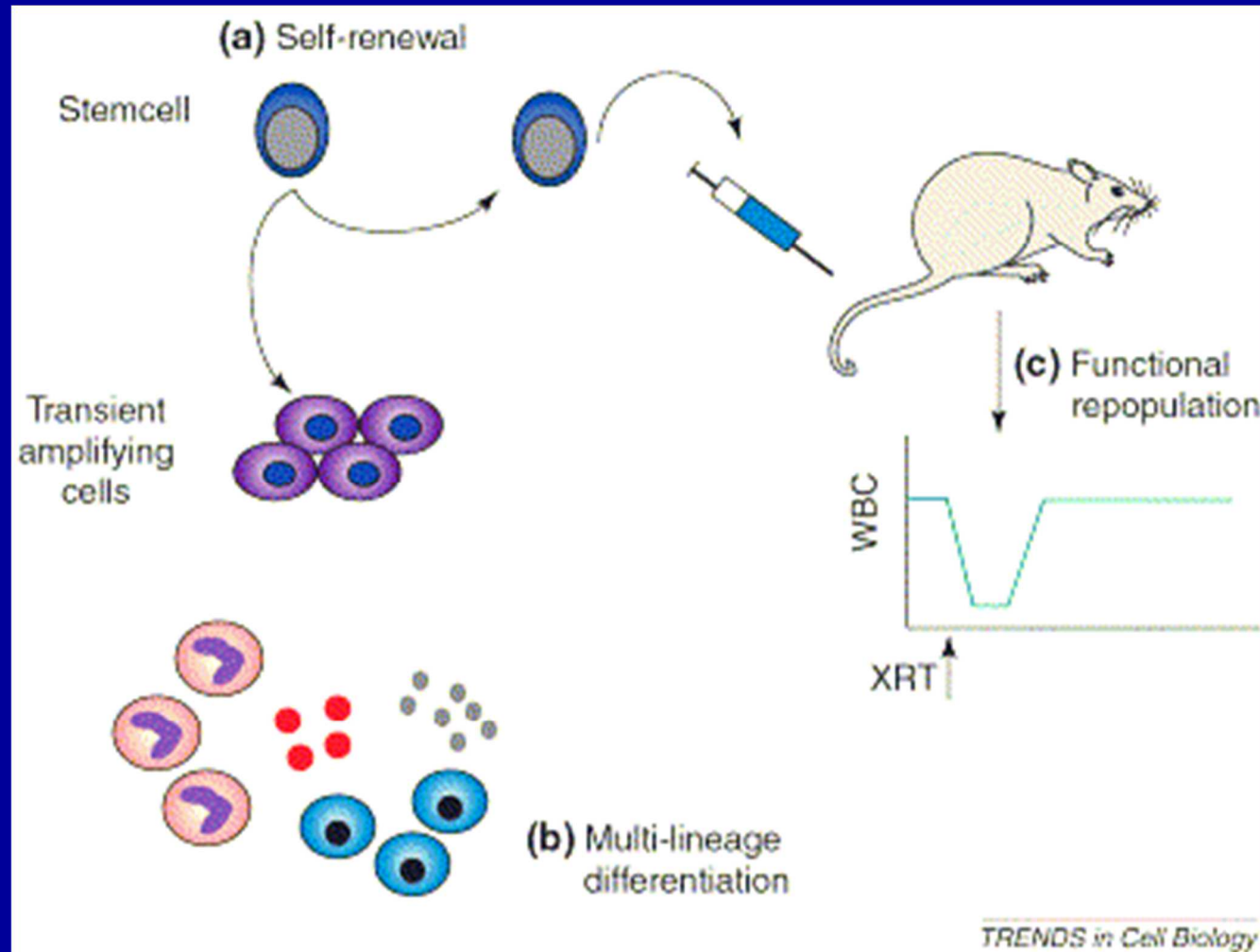
Indeks

- Celleterapi
- Status over humane embryonale stamceller
 - Alternative metoder til etablering af hESC
- Hvorfor terapeutisk kloning?
 - Alternative metoder til terapeutisk kloning
- Fremtidige perspektiver

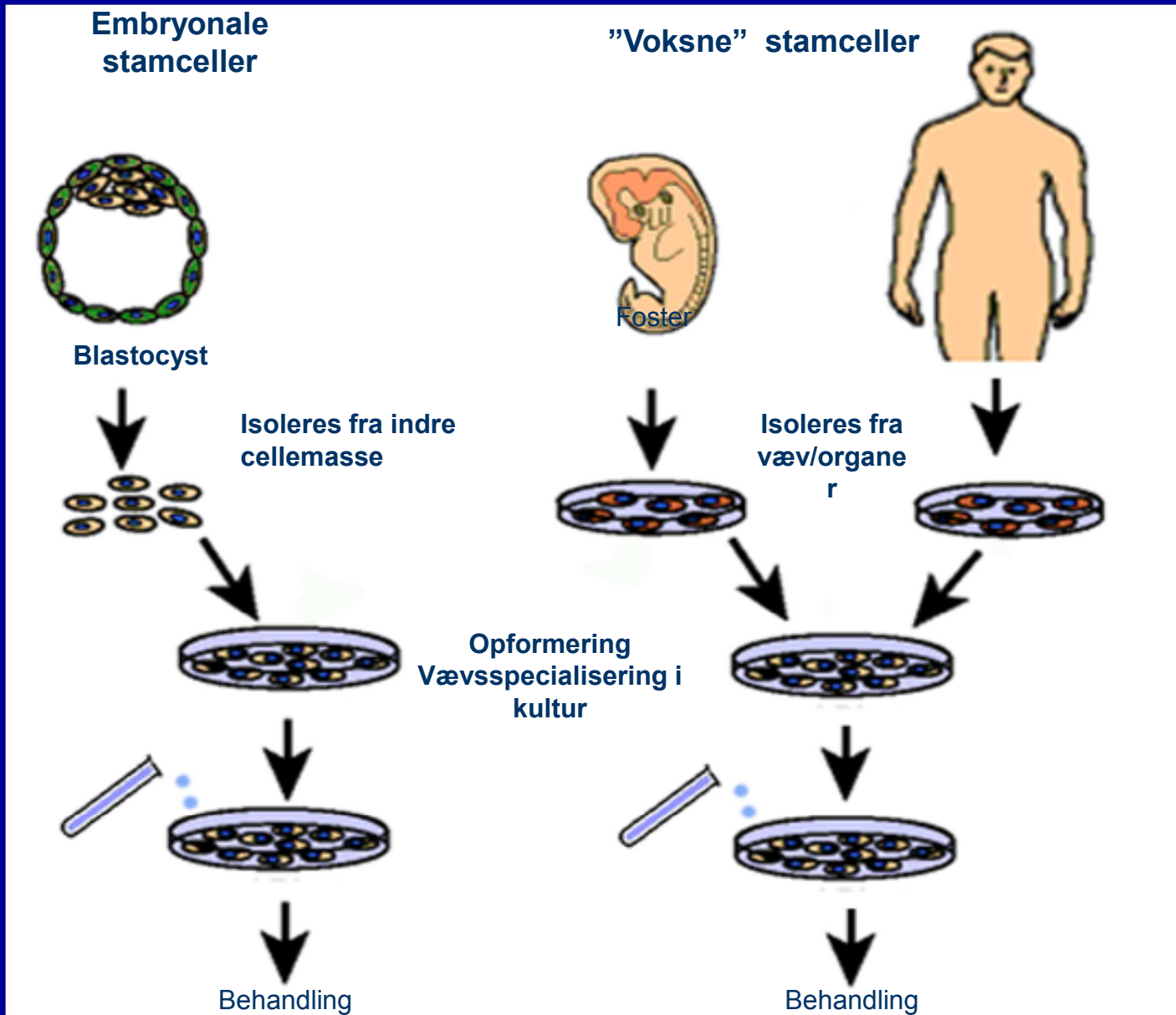
Celleterapi for aldrings- og aldersbetingede sygdomme

- Celletransplantation
 - Behandling af systemiske degenerative sygdomme
- Vehicle for gene transfer
 - Genterapi (GH, Insulin)
- Reparation af lokaliserede vævsdefekter
 - Iskæmisk væv i hjertet og af underekstremiteter
 - Ikke-healede frakturer, knogledefekter efter fjernelse af tumorer
 - Traumatiske bruskdefekter, osteoartrose
- Tissue engineering
 - vævsrekonstruktion via vævstransplantation

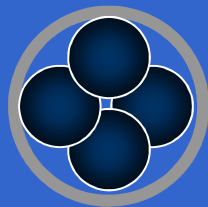
Hvad er Stamceller?



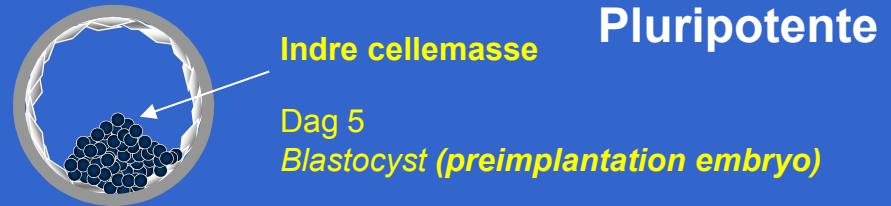
Kilder til stamceller



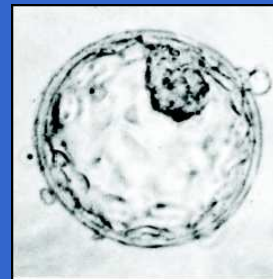
Tidlig human embryonal udvikling



Totipotente

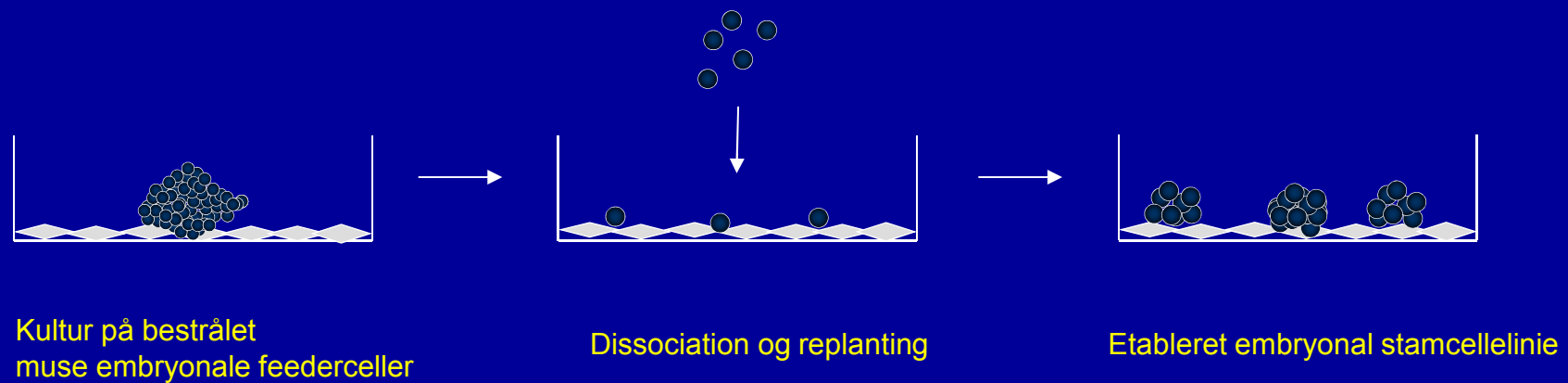
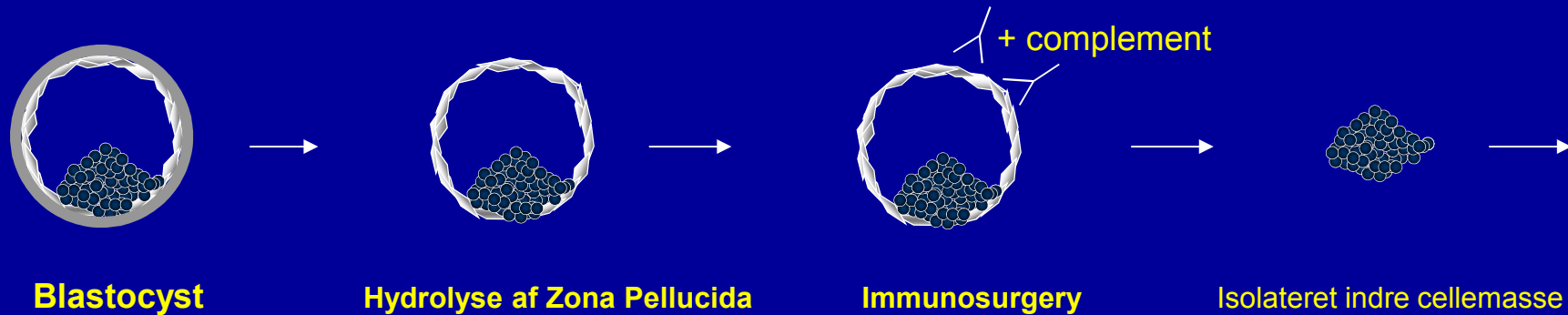


Pluripotente



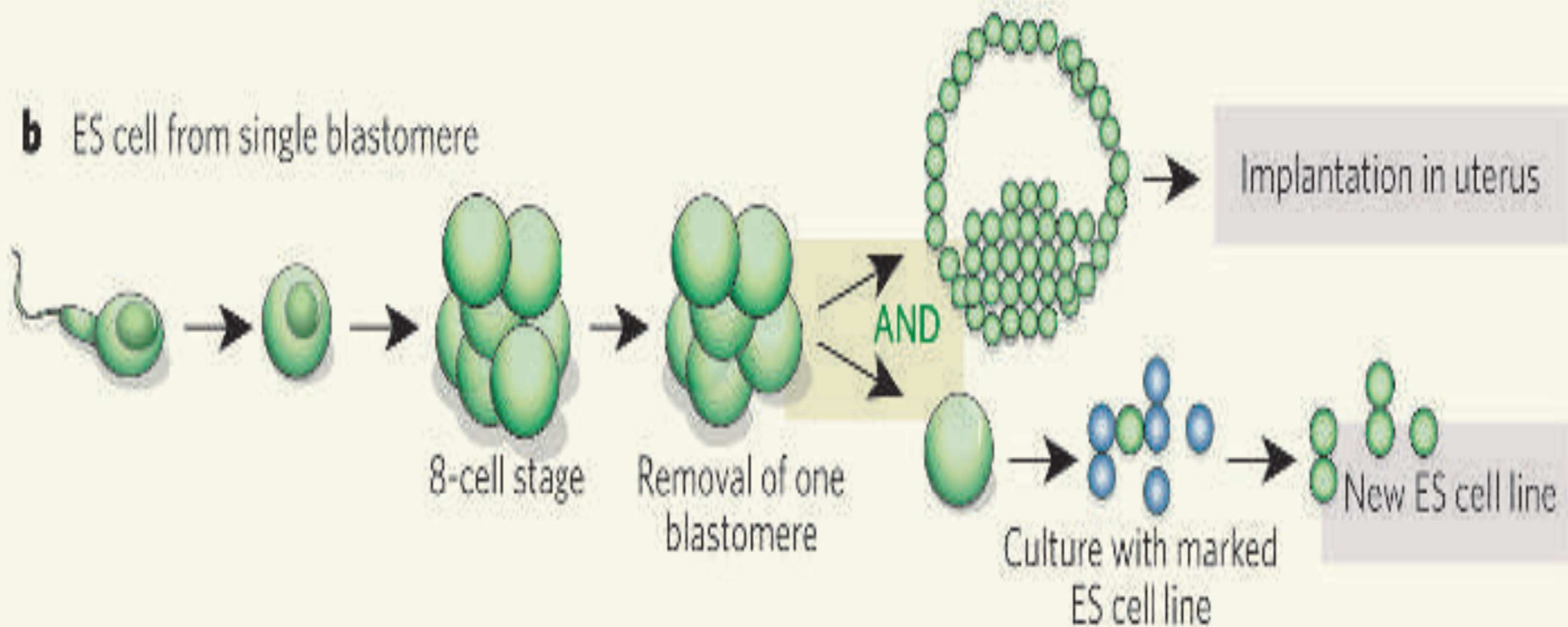
Implantation i
uterus

Etablering af hES kultur



Alternative metoder til etablering af hESC

Etablering af hESC fra blastomere

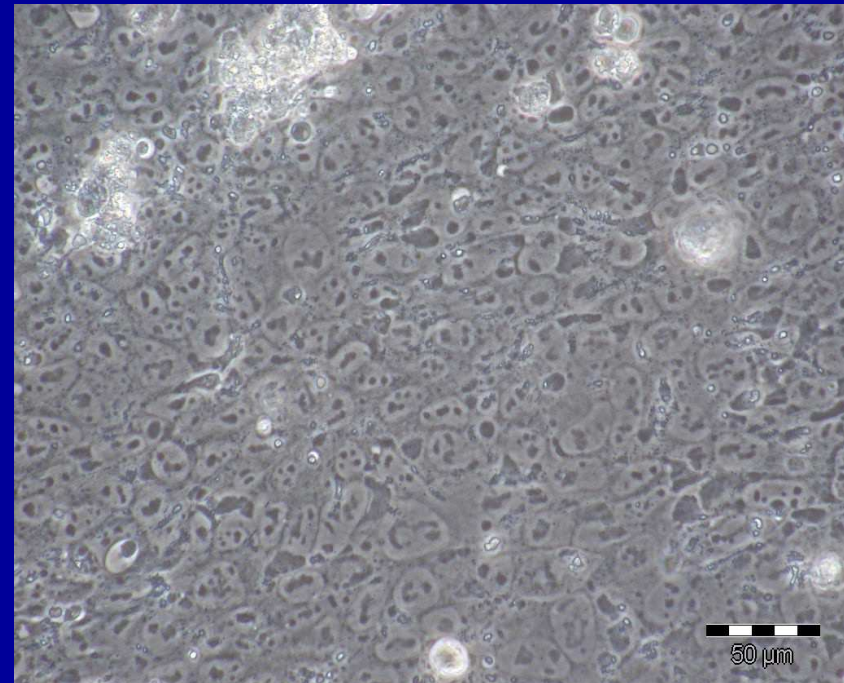
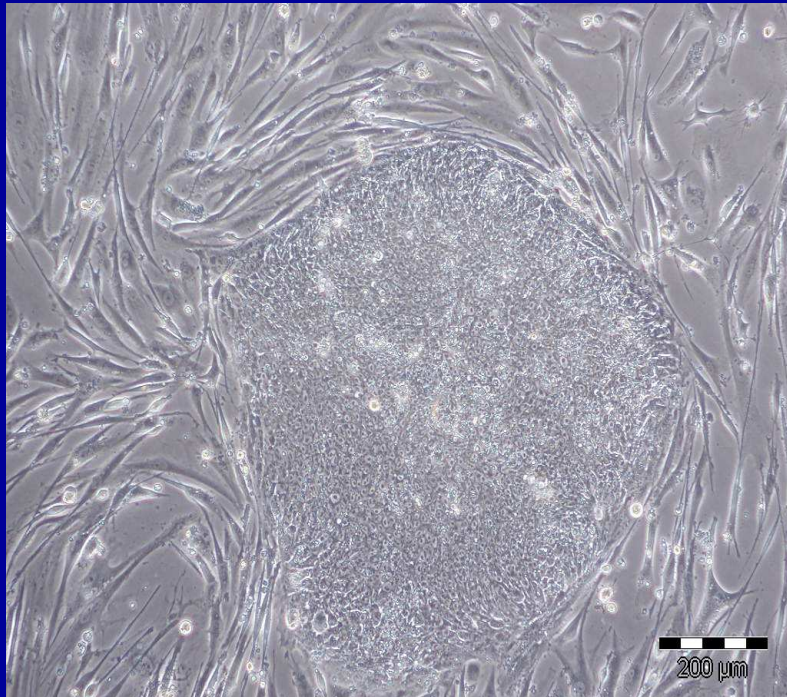


Hvordan går det med hESC
forskning i Danmark?

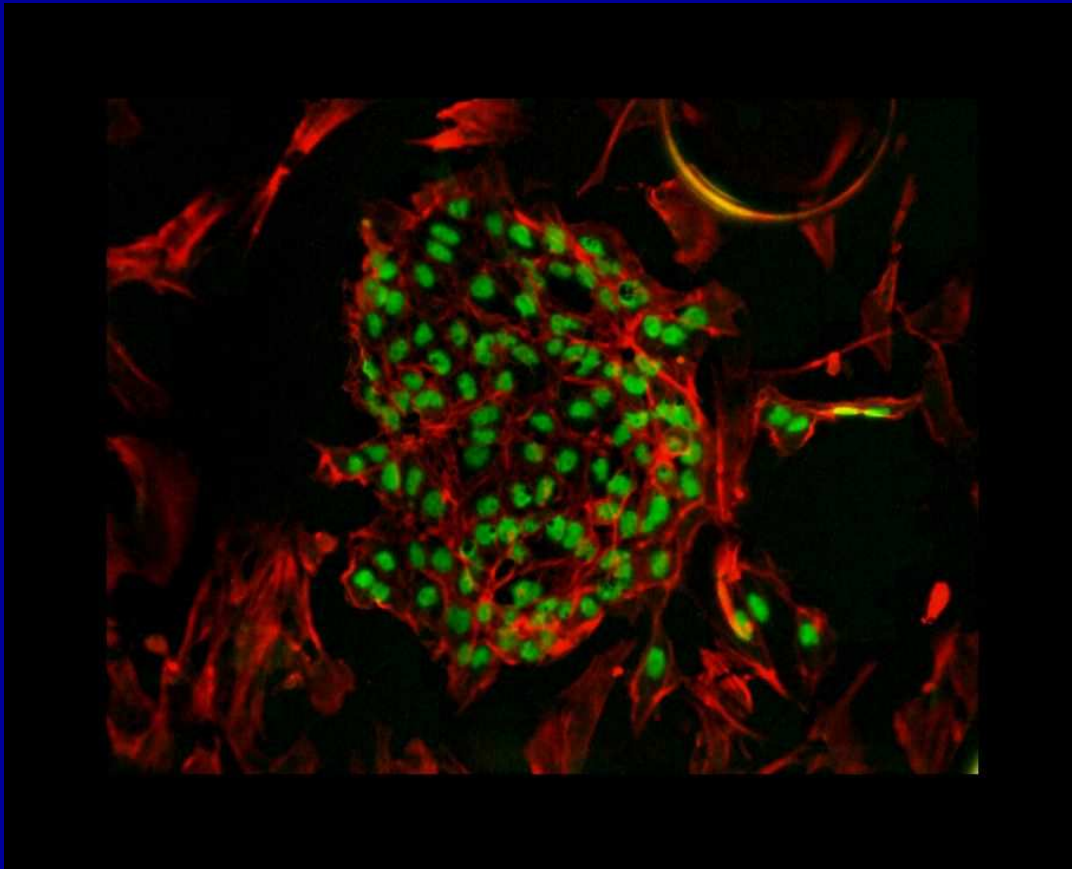
Antal af overskydende befrugtede æg anvendt på KMEB

Year	Nr. IVF cycle	Nr. donated fertilized eggs	Nr. Blastocysts
2003	56	210	15
2004	92	299	23
Total	148	509	38 (7.5%)

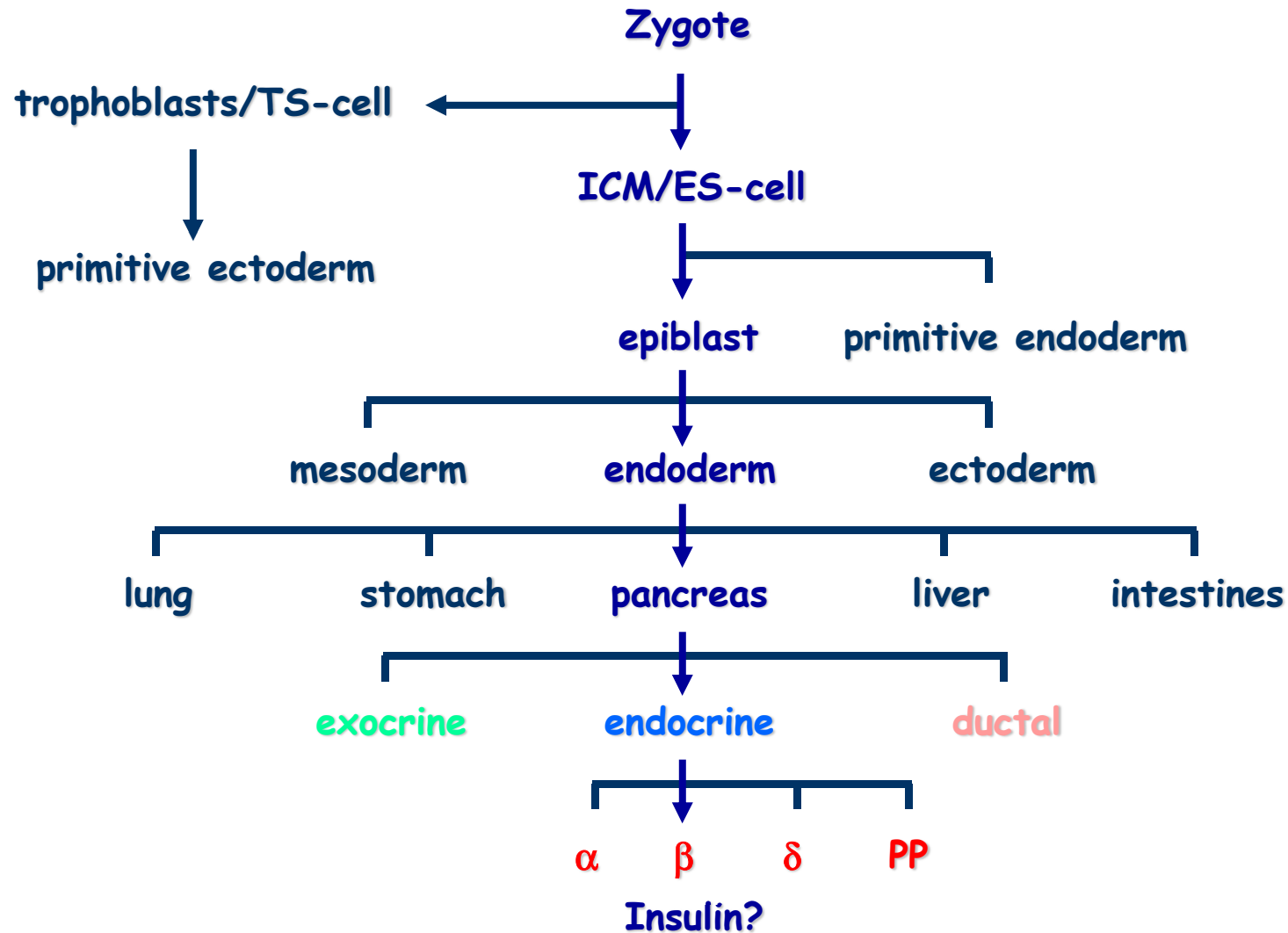
hES line-Odense 3



Oct 4 expression

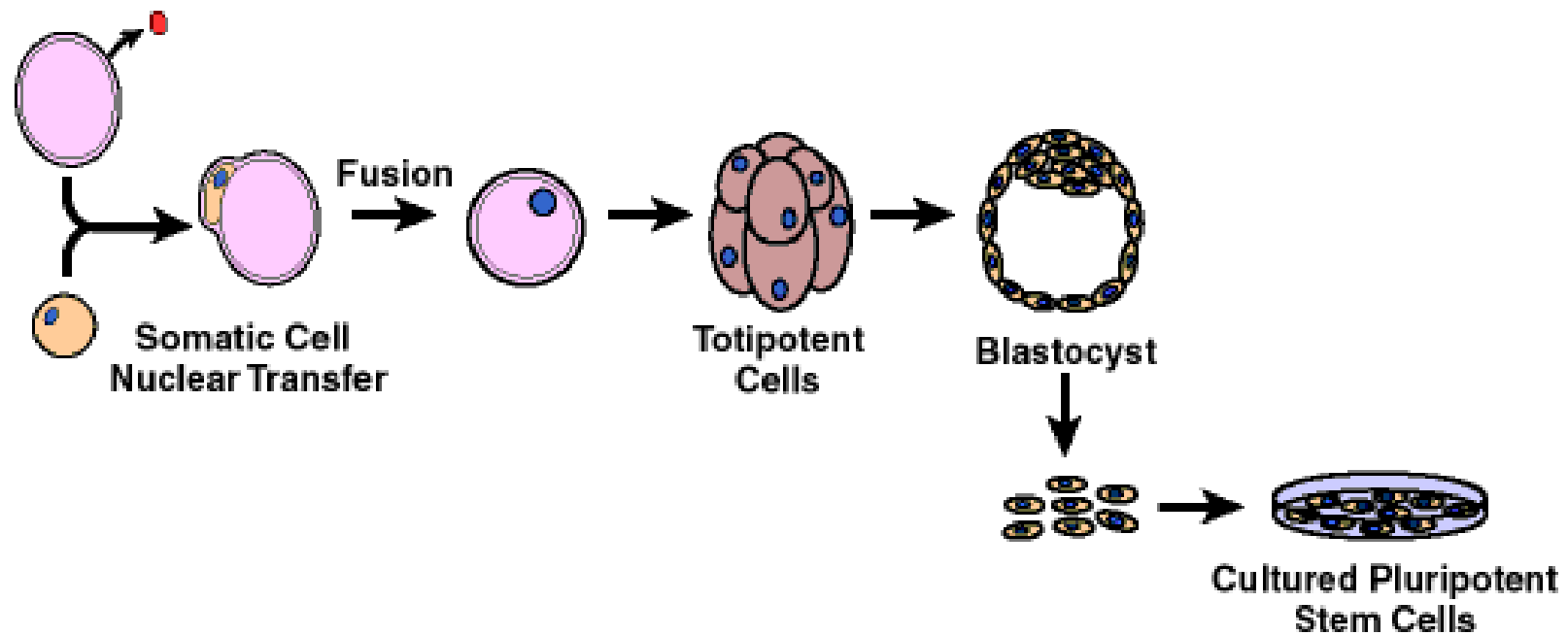


Development of an insulin-producing beta-cell

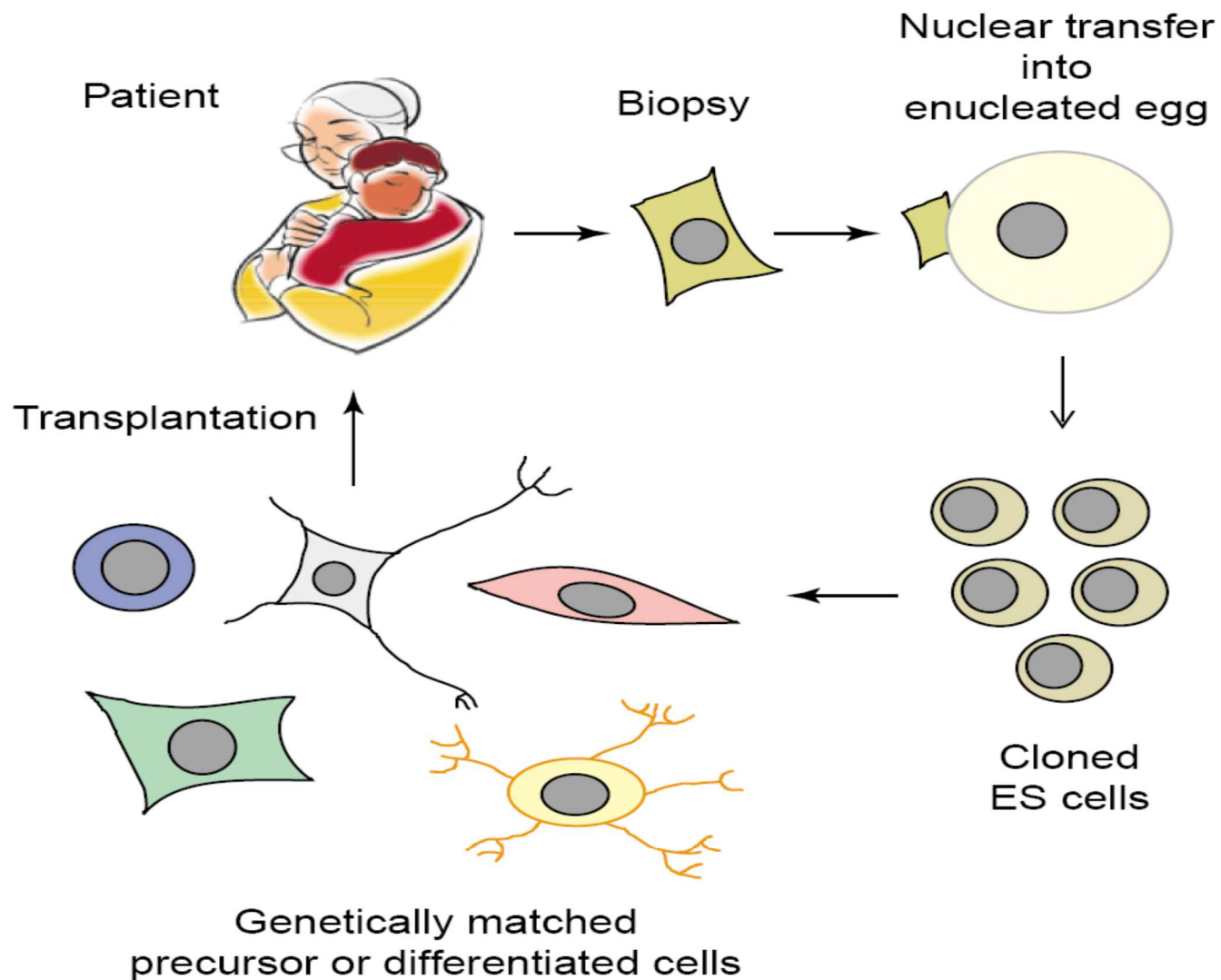


Hvordan kan man undgå
immunologisk frastødning,
hvis man vil bruge stamceller i
transplantation?

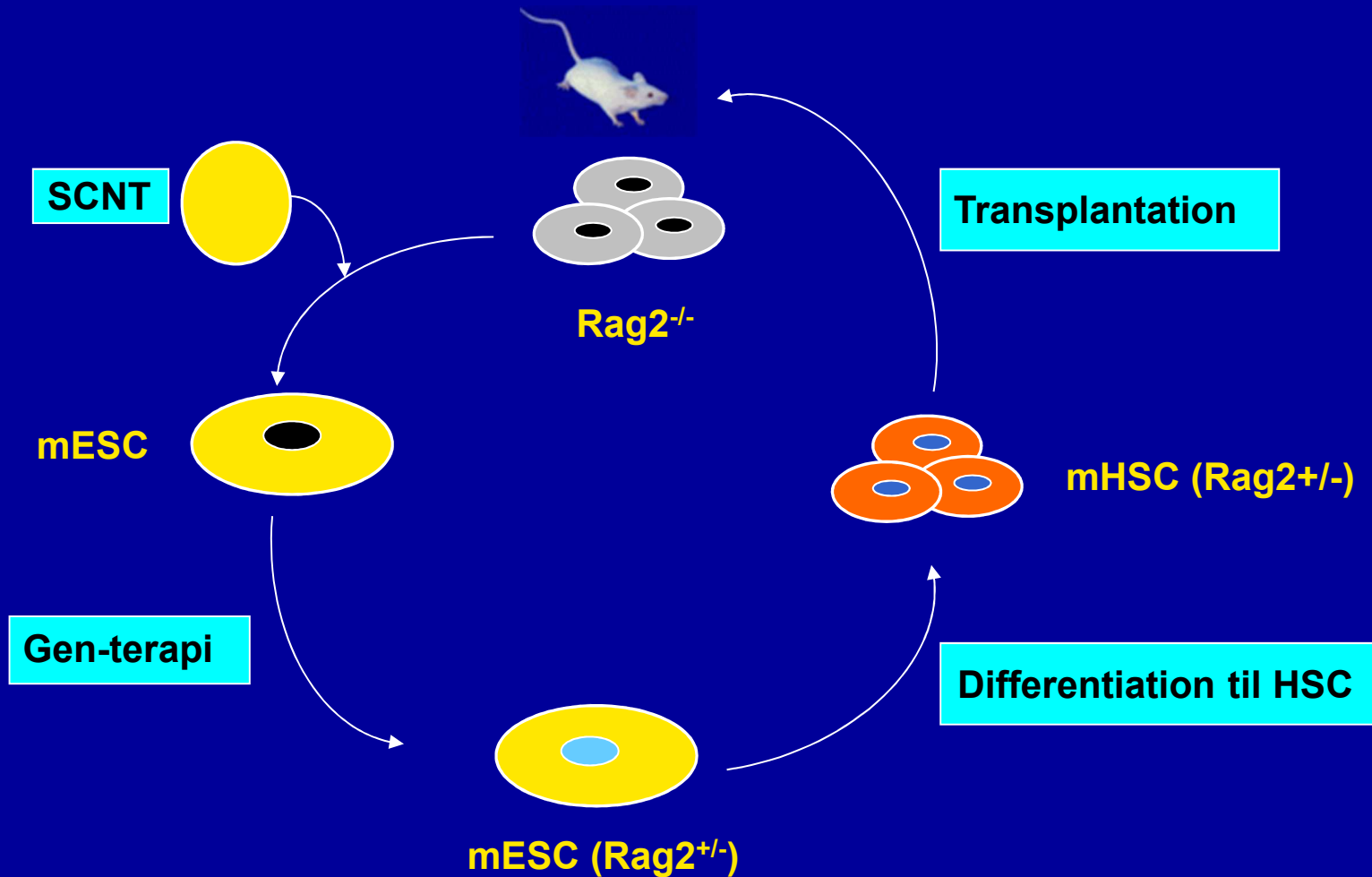
Terapeutisk kloning



Hvordan kan det bruges i sygdomsbehandling?

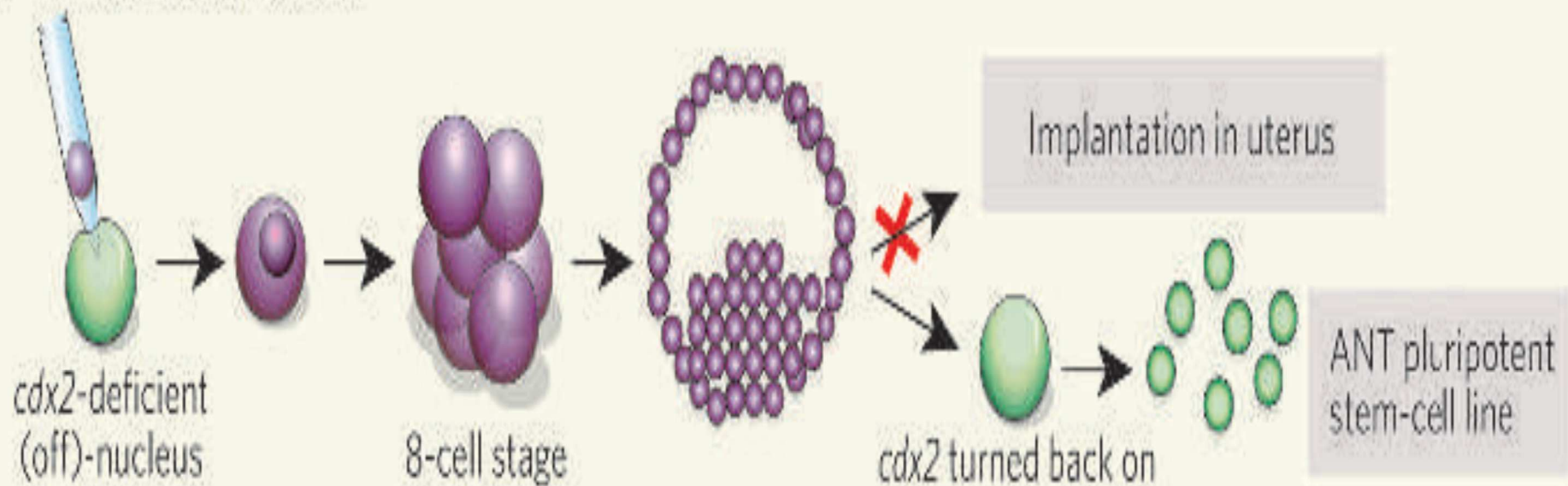


Virker terapeutisk kloning?

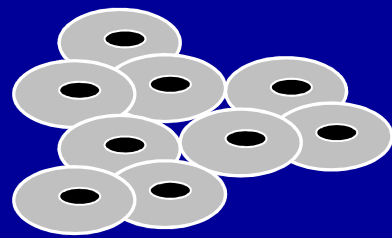


Altered Nuclear Transfer (ANT)

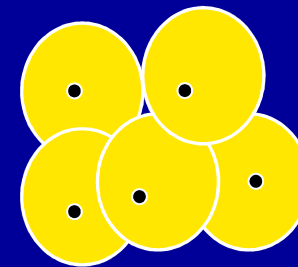
d Altered nuclear transfer



Hvor kommer oocyterne fra?



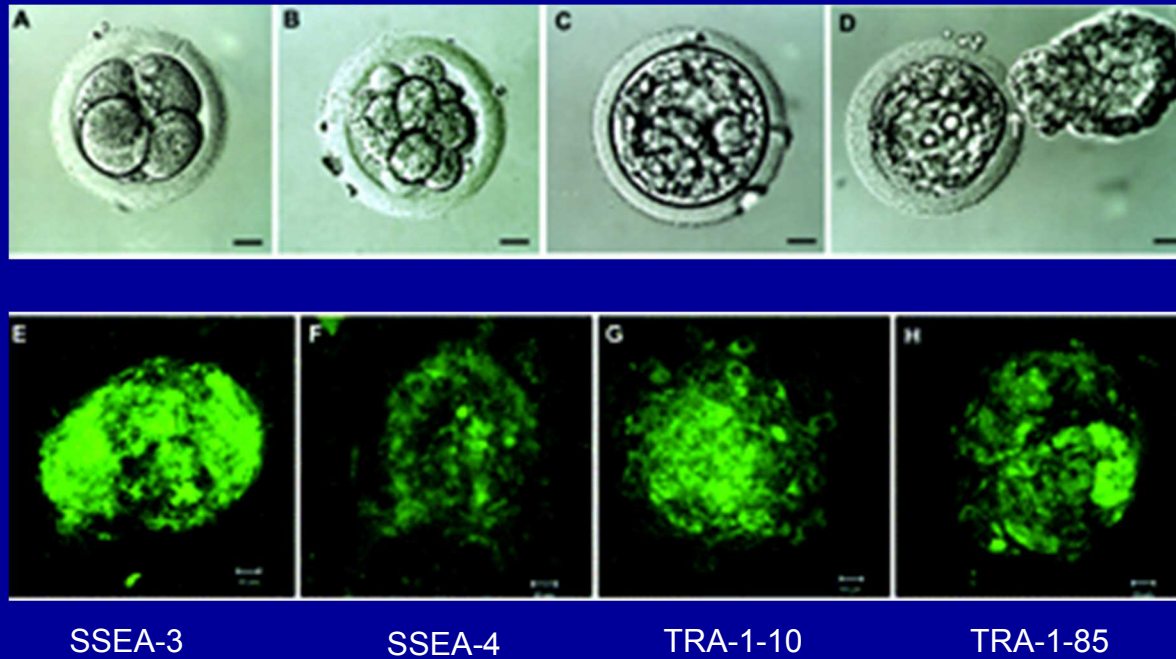
Human Embryonale stamceller



Oocyter

Hvor langt er vi nået i forskning
af terapeutisk kloning hos
mennesket?

hES cells generated by SCNT into human oocytes 2004



Succeraten 1:200 forsøg

Science, 2004

hES cells generated by SCNT into human oocytes 2005

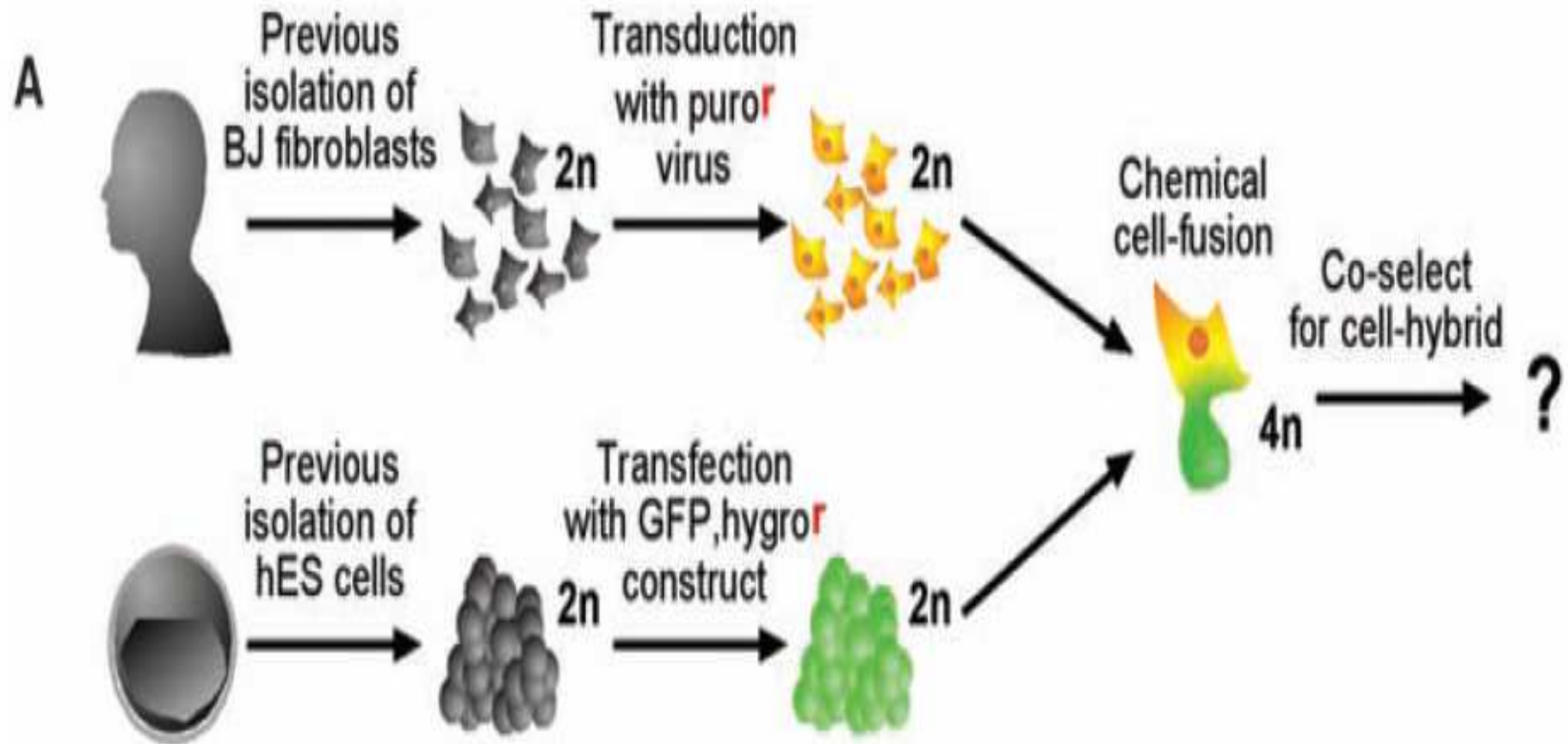
- hESC fra patienter med diverse sygdomme, f.eks. diabetes, immundefekter, neurologiske sygdomme
- Succesrate 1:10 forsøg
- Fuld immunologisk match
- Dyrkede celler på humane feeders

Alternativ til SCNT

"Cellulær Reprogrammering"

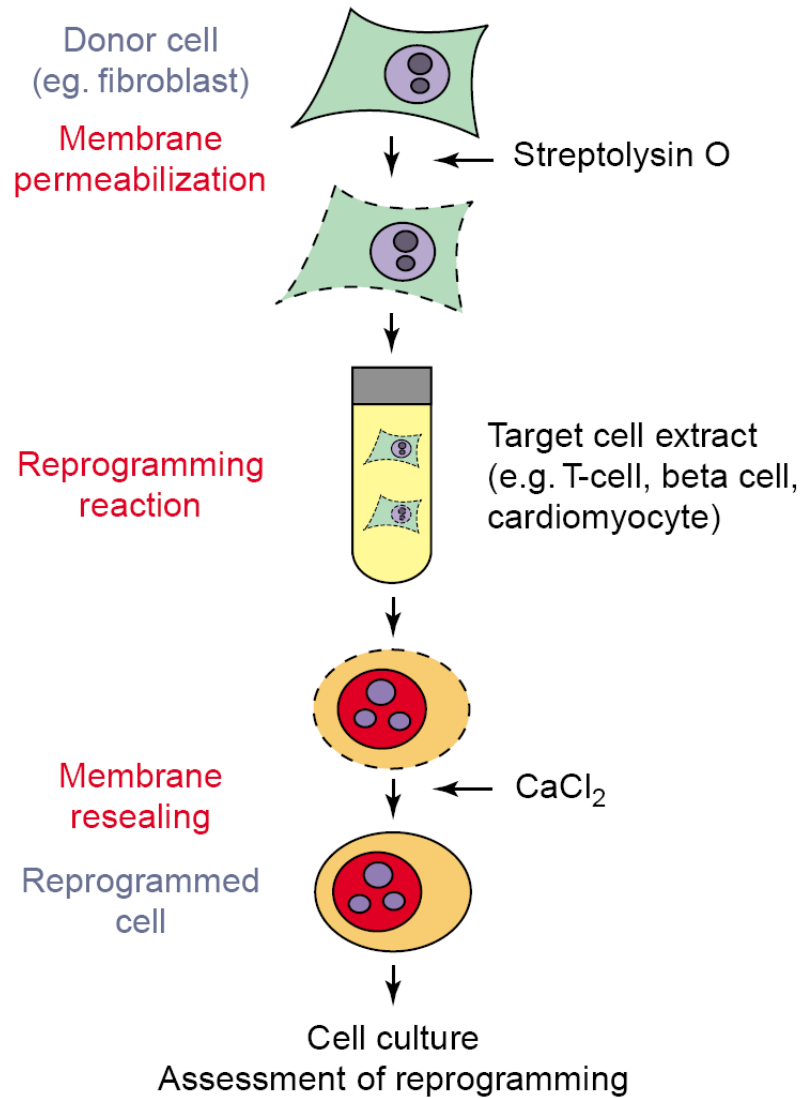
- Reprogrammering vha. cellefusion
 - Science 2005
- Reprogrammering vha. cellulær ekstrakt
 - Nature Biotech 2002

Reprogramming af somatiske celler vha. embryonale stamceller



Reprogramming vha. celleekstrakt

(a)



Hvad er status over reproduktiv kloning?

- Lykkes kun i flere mammalarter (f.eks. mule, kat, hund, minigris, ko, mus, frø, får)
- Ingen af de klonede dyr er normale
- Inefficient procedure
 - Somatiske celler 1-3%
 - Differentierede celler <0.001%
 - ES celler 12-25%
- Large offspring syndrome
- Problemer vedr. epigenetisk reprogrammering (gene imprinting)

Fremtidige perspektiver i DK

- National strategi for regenerativ medicin
 - National stamcelle bank
 - National hESC konsortium
- Samarbejde med internationale organisationer
 - JDF
 - International Stem Cell forum
 - UK Stem Cell Bank