



Federazione delle associazioni  
scientifiche e tecniche  
fondata nel 1897



# 2014

## I GIOVANI E LE SCIENZE



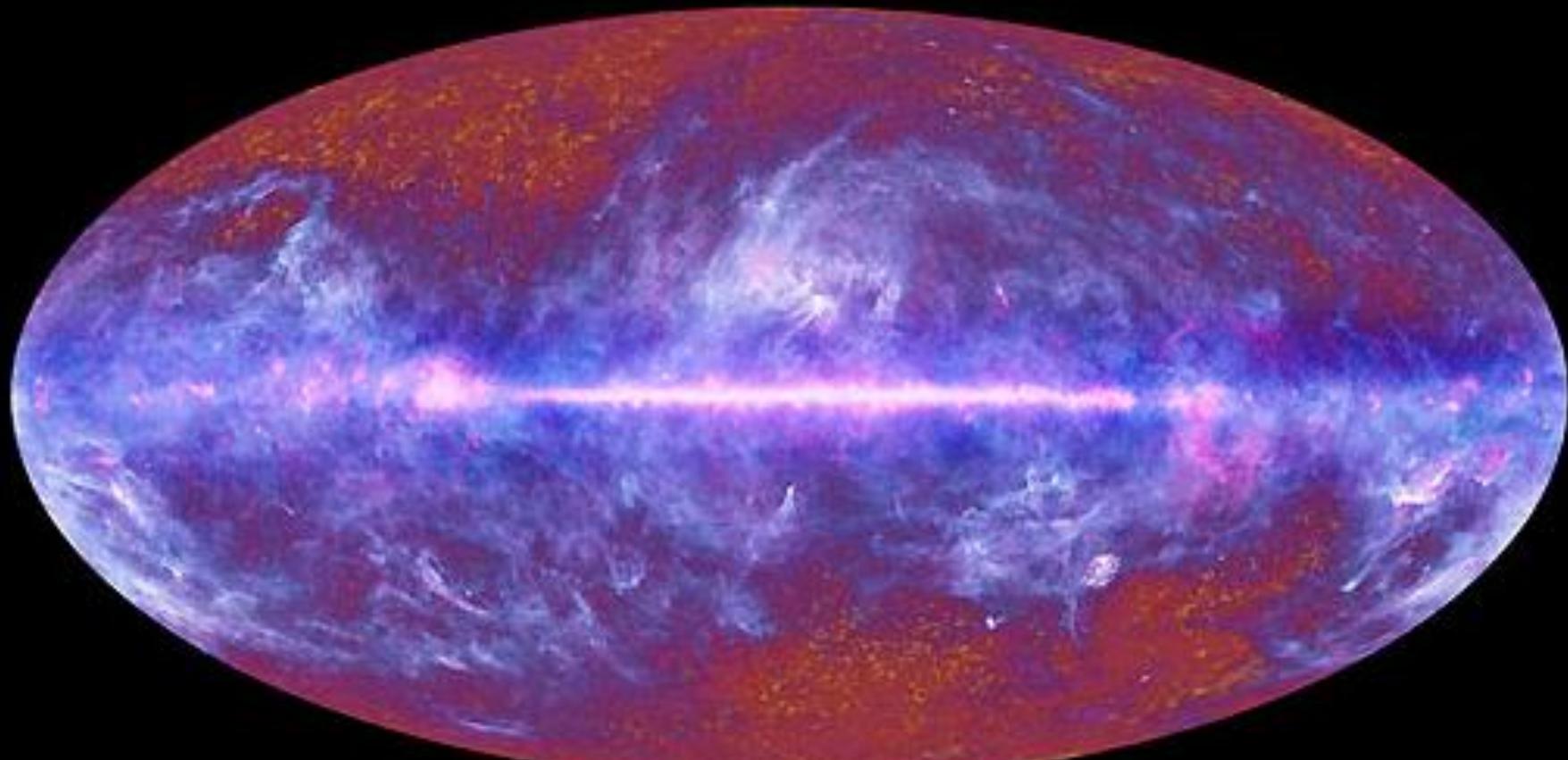
FAST, Milano  
2-5 MAGGIO 2014

sotto l'Alto Patronato del Presidente della Repubblica

con la collaborazione  
e il contributo di

26<sup>a</sup>

# dalla descrizione alla sintesi del vivente



CarloAlberto Redi  
Università di Pavia  
Accademico dei Lincei  
[carloalberto.redi@unipv.it](mailto:carloalberto.redi@unipv.it)

Notre vie est un voyage  
Dans l'Hiver e dans la Nuit,  
Nous cherchons notre passage  
Dans le Ciel où rien ne luit.

Canzone delle Guardie Svizzere: 1793

Louis-Ferdinand Céline  
Viaggio al termine della notte

# THE UNIVERSE

Life Form #126GV29APZ23  
Planet Earth  
Solar System 1  
Milky Way Galaxy  
Virgo Supercluster

Dear Life Form,

Congratulations!

You have been selected for the role of **EXISTENCE**. We are proud to offer you this highly coveted position, and applaud you on overcoming the immense odds to be with us. You are about to enter a highly competitive work environment filled with natural wonders, millions of diverse species, astronomical treasures, and personal tragedies and triumphs.

Your position will begin starting **AT BIRTH** and will last until **DEATH**. You have been given the following tools in your starter kit:

- Large, highly developed brain
- Opposable thumbs
- Bipedalism
- Complex social networks

Now that you're ready to begin, we suggest you make the most of your time. You may want to start by cultivating social relationships and improving conditions for other newcomers.

If you have questions, please consult your assigned advisor, **SCIENCE**. We wish you best of luck during your time with us, and look forward to seeing you in another form once your contract has expired.

Sincerely,



The Universe



NOVEMBER 13, 2006

# TIME

INSIDE THIS ISSUE:  
A 48-PAGE  
SPECIAL SECTION

THE BEST  
INVENTIONS  
OF 2006

## GOD VS. SCIENCE

A spirited debate between  
atheist biologist **Richard Dawkins**  
and Christian geneticist **Francis Collins**



# The Worm *(Caenorhabditis elegans)*

*C. elegans* is a nematode, a smooth-skinned worm with a long, unsegmented, cylindrical body tapered at both ends. Comprising about 1,000 cells, it is the most primitive animal to exhibit characteristics that are important in the study of human biology and disease. Though tiny and transparent, *C. elegans* contains a full set of differentiated tissues, including a nervous system with a "brain," which allows the study of behavior in a worm that is capable of learning. It is found worldwide in soil and rotting vegetation.

‘Omics

**Genome size:** 97 Mb  
(96,893,008 bp)

**Chromosomes:** 5 autosomes,  
plus X

**Number of genes:**  
20,000 predicted

**Average gene:** 5 kb,  
5 exons per gene

**Proteins:** 1,341 characterized;  
8,012 have unknown function

**Development:** 3 days,  
from egg to maturity

## Web Sites

**WormBase:** [www.wormbase.org](http://www.wormbase.org)

**Worm Atlas:** [www.wormatlas.org](http://www.wormatlas.org)

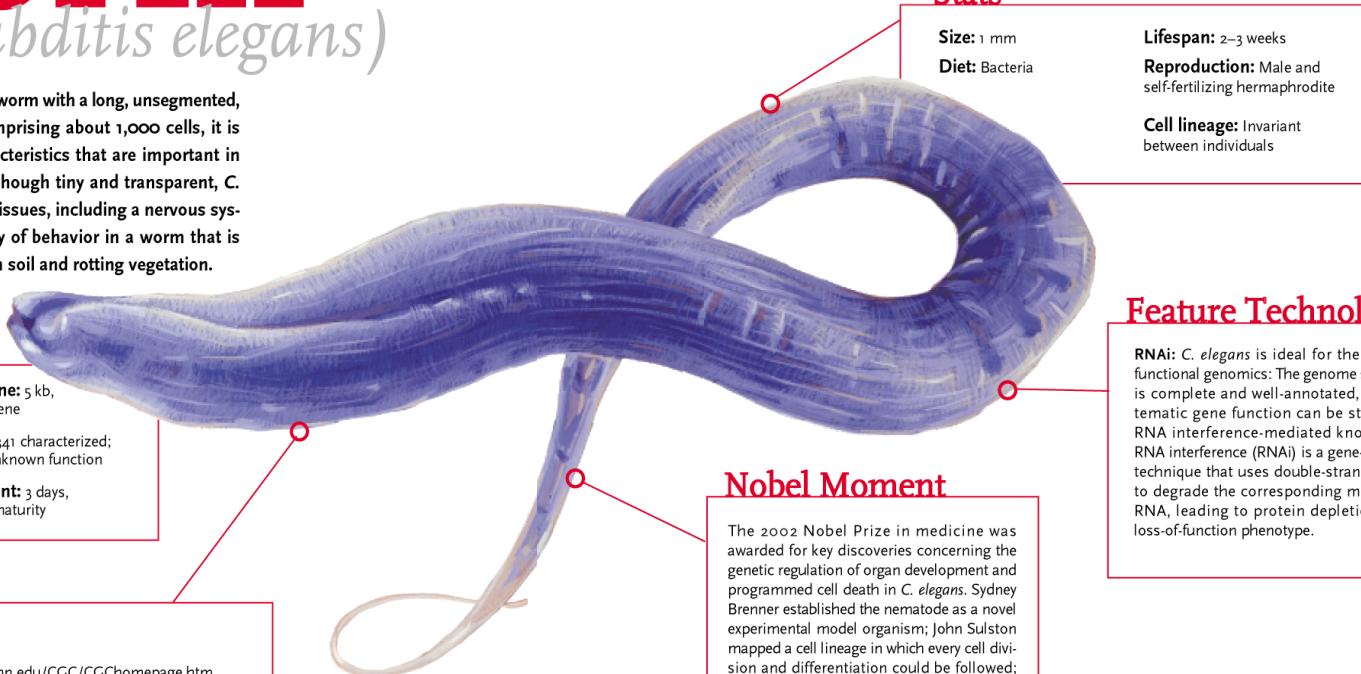
**Caenorhabditis Genetics Center:** biosci.umn.edu/CGC/CGChomepage.htm

*C. elegans* Web Server: elegans.swmed.edu

*elegansNet*: [members.tripod.com/C.elegans/index.htm](http://members.tripod.com/C.elegans/index.htm)

*“You have made your way from worm to man,  
and much in you is still worm.”*

—Friedrich Nietzsche (1844–1900)



Stats

**Size:** 1 mm

### Diet: Bacteria

**Lifespan:** 2–3 weeks

**Reproduction:** Male and self-fertilizing hermaphrodite

## **Cell lineage:** Invariant between individuals

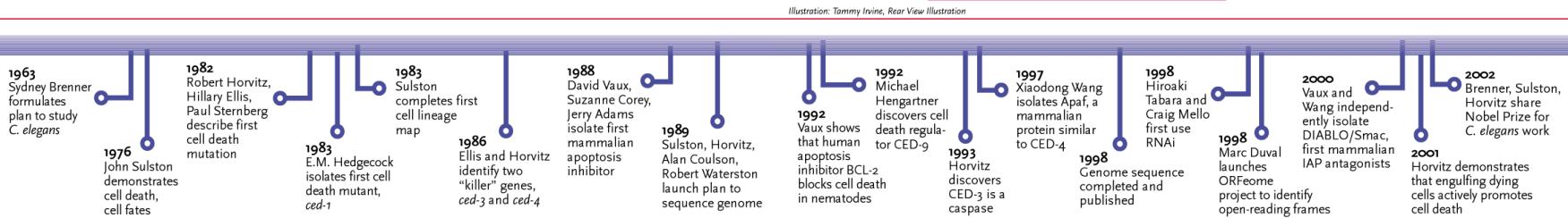
## Feature Technology

**RNAi:** *C. elegans* is ideal for the study of functional genomics: The genome sequence is complete and well-annotated, and systematic gene function can be studied by RNA interference-mediated knockdown. RNA interference (RNAi) is a gene-silencing technique that uses double-stranded RNA to degrade the corresponding messenger RNA, leading to protein depletion and a loss-of-function phenotype.

## Nobel Moment

The 2002 Nobel Prize in medicine was awarded for key discoveries concerning the genetic regulation of organ development and programmed cell death in *C. elegans*. Sydney Brenner established the nematode as a novel experimental model organism; John Sulston mapped a cell lineage in which every cell division and differentiation could be followed and Robert Horvitz discovered and characterized key genes controlling cell death.

*Illustration: Tammy Irvine, Rear View Illustrations*



# The Fly (*Drosophila melanogaster*)

*Drosophila melanogaster*, the diminutive and ubiquitous fruit fly, is the classic organism for the study of animal genetics. It was introduced to the lab early in the 20th century by Thomas Hunt Morgan, for good practical reasons: short life cycle, ease of culture, and high fecundity. Mutant flies, with defects in any of several thousand genes, are now used for the study of genetics, development, behavior, and other topics.

## 'Omics

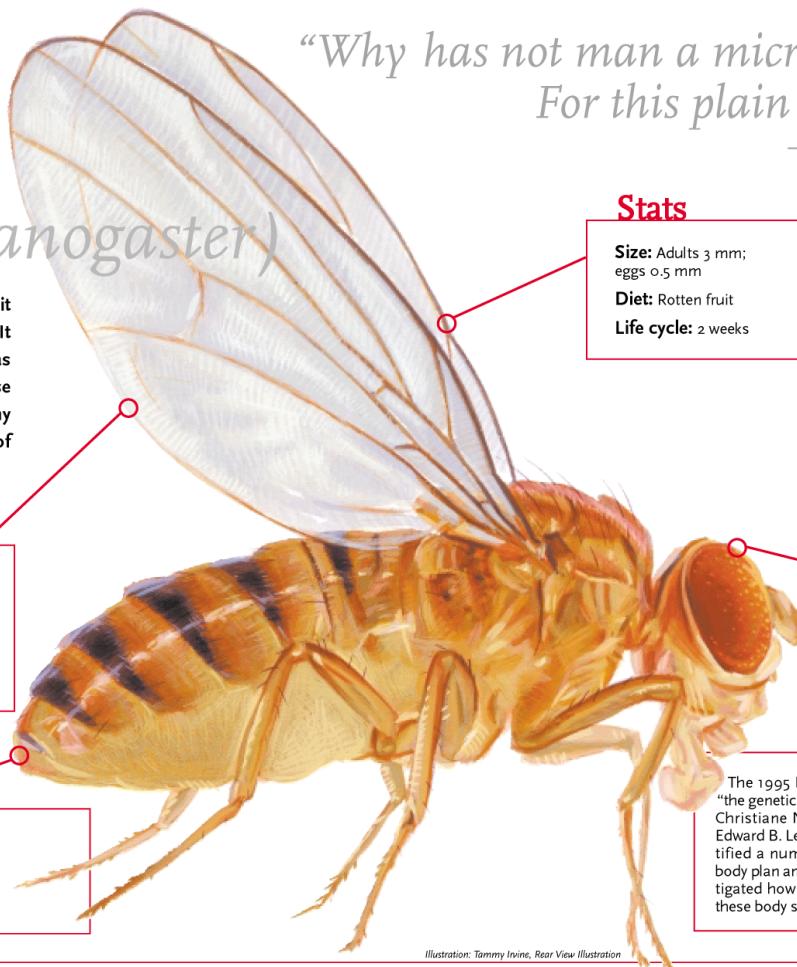
**Genome size:** 180 Mb

**Chromosomes:** 3 autosomes, plus X and Y

**Number of genes:** 13,639 predicted

**Average gene:** 3 kb, 4 exons per gene

**Proteins:** 23% have no match with other organisms



## Stats

**Size:** Adults 3 mm; eggs 0.5 mm

**Diet:** Rotten fruit

**Life cycle:** 2 weeks

**Reproduction:** Females can lay up to 100 eggs in one day

**Development:** 9 days from fertilization to adult

## Feature Technology

**P-transposable Elements:** A massive gene disruption project aims to induce mutagenesis through the use of P-transposable elements. So far, 85 known and eight novel families of "jumping genes" have been identified. A total of 1,572 full and partial transposable elements have been mapped, comprising 3.86% of the sequence. Only 436 of those transposable elements are contained within the 61.4 Mb of sequence that contains genes.

## Web Sites

*Drosophila* Virtual Library: [www.ceolas.org/fly/index.html](http://www.ceolas.org/fly/index.html)

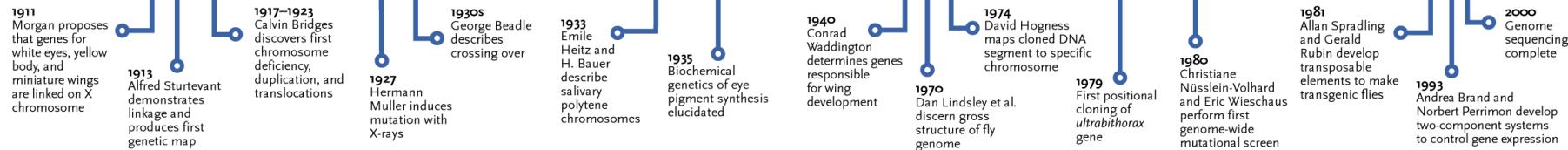
FlyBase: [flybase.bio.indiana.edu](http://flybase.bio.indiana.edu)

*Drosophila* DNA Microarray Homepage: [cmgm.stanford.edu/~kwhite/index.html](http://cmgm.stanford.edu/~kwhite/index.html)

## Nobel Moment

The 1995 Nobel Prize in medicine was awarded for "the genetic control of early embryonic development" to Christiane Nüsslein-Volhard, Eric F. Wieschaus, and Edward B. Lewis. Nüsslein-Volhard and Wieschaus identified a number of *Drosophila* genes that control the body plan and formation of body segments. Lewis investigated how genes control the further development of these body segments into specialized organs.

Illustration: Tammy Irvine, Rear View Illustration



# The Mouse (*Mus musculus*)

"Thou will be as valiant as the wrathful dove  
or most magnanimous mouse."

—William Shakespeare (1564–1616), *Henry IV*

Naturally comfortable in fields and in kitchens, *M. musculus*, for the last century, has been virtually indispensable in the research lab. This animal now appears in all shapes and sizes, as researchers consistently produce new strains. Mouse production is a \$200 million-a-year business, with transgenics accounting for a third of the new mice created.

## 'Omics

**Genome size:** ~2,600 Mb

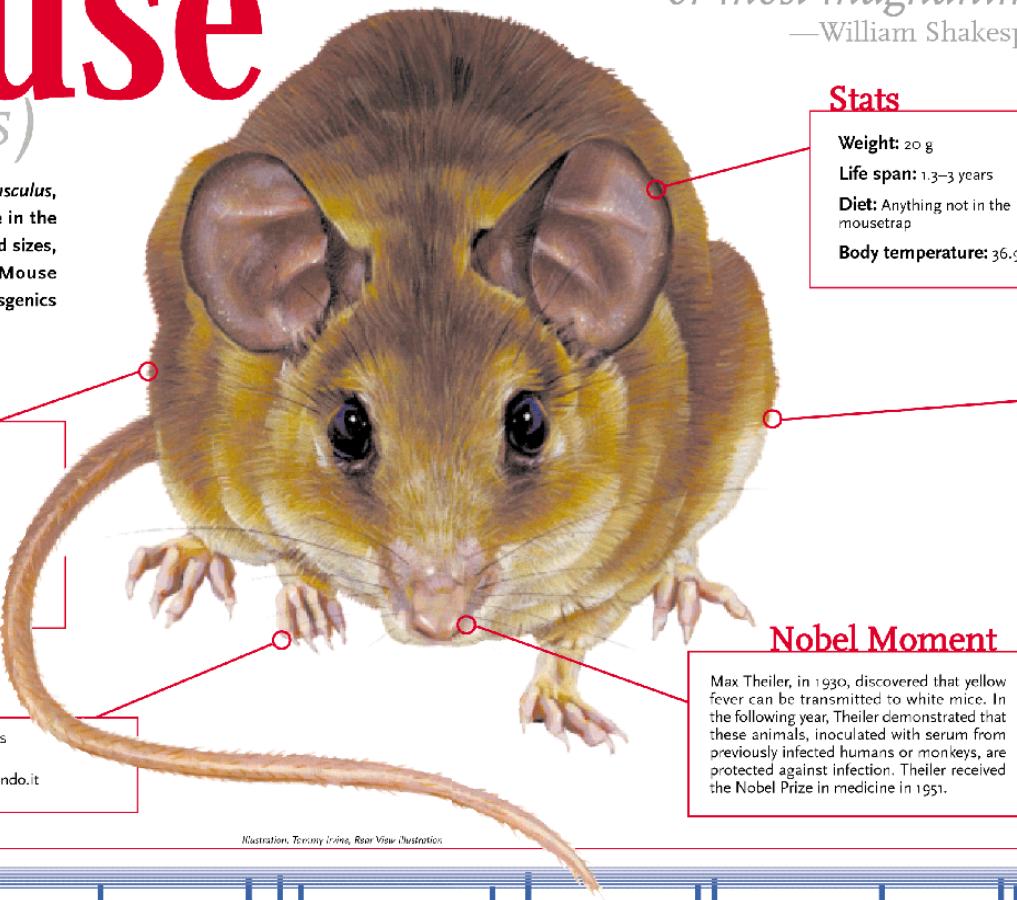
**Chromosomes:** 19 autosomes, plus X and Y

**Number of genes:** ~30,000; 96% of euchromatic chromatin is sequenced

**Average gene:** 40 kb; 8.3 exons per gene

**Human homologs:** Less than 1% have no detectable homolog in humans

**Diverged from human lineage:** Estimated 75 million years ago



## Web Sites

**Mouse genome server:** [www.ensembl.org/Mus\\_musculus](http://www.ensembl.org/Mus_musculus)

**Jax Mice:** (describing 2500+ strains) [jaxmice.jax.org](http://jaxmice.jax.org)

**EMBL Mouse Biology Programme:** [www.embl-monterotondo.it](http://www.embl-monterotondo.it)

## Stats

**Weight:** 20 g

**Life span:** 1.3–3 years

**Diet:** Anything not in the mousetrap

**Body temperature:** 36.9° C

**Sexual maturity:** After 4 weeks of age

**Estrus cycle:** Every 4–5 days

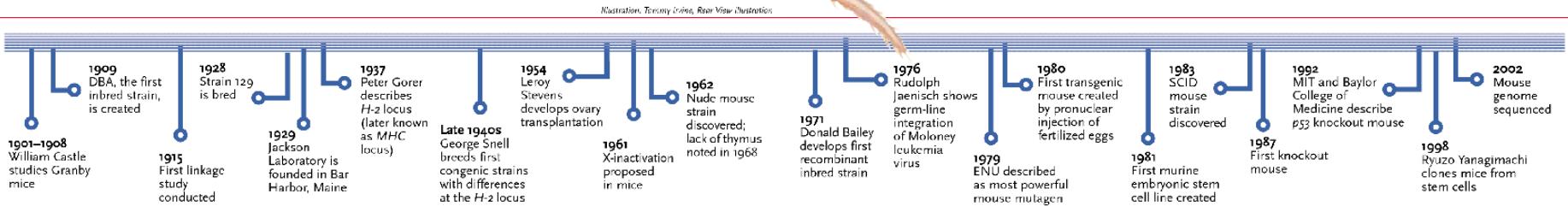
**Gestation:** Averages 19–21 days; 1–10 pups

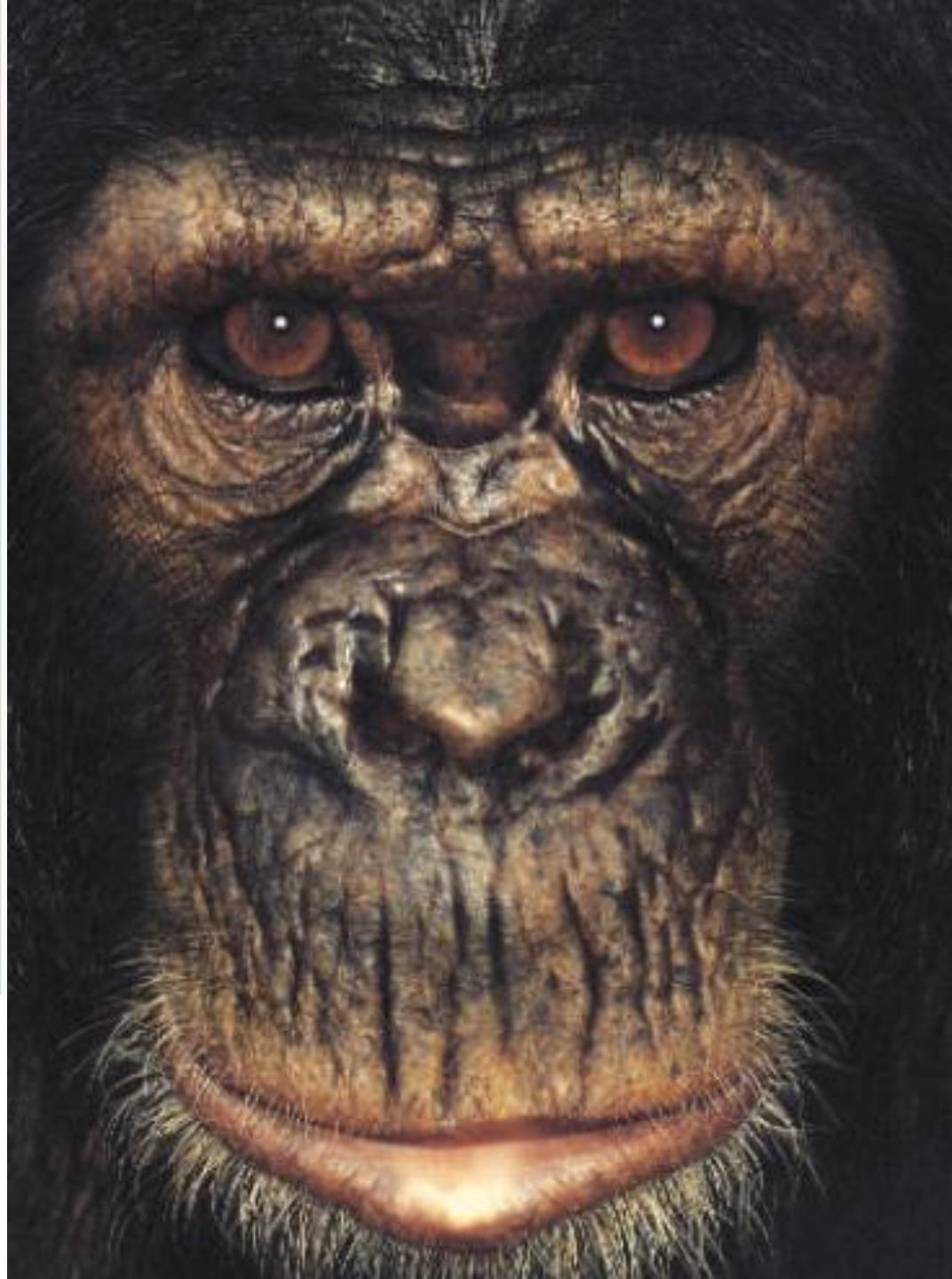
## Feature Technology

**Conditional Transgenics:** A suite of approaches exists to manipulate gene expression, including conditional transgenics, which provide an *in vivo* method of controlling spatial and temporal gene regulation. Employing tissue-specific or developmentally restricted promoters to drive expression of the transgene or Cre recombinase, conditional transgenics provide greater precision than conventional knockouts, allowing researchers to see the effects of loss of a gene in a particular tissue.

## Nobel Moment

Max Theiler, in 1930, discovered that yellow fever can be transmitted to white mice. In the following year, Theiler demonstrated that these animals, inoculated with serum from previously infected humans or monkeys, are protected against infection. Theiler received the Nobel Prize in medicine in 1951.

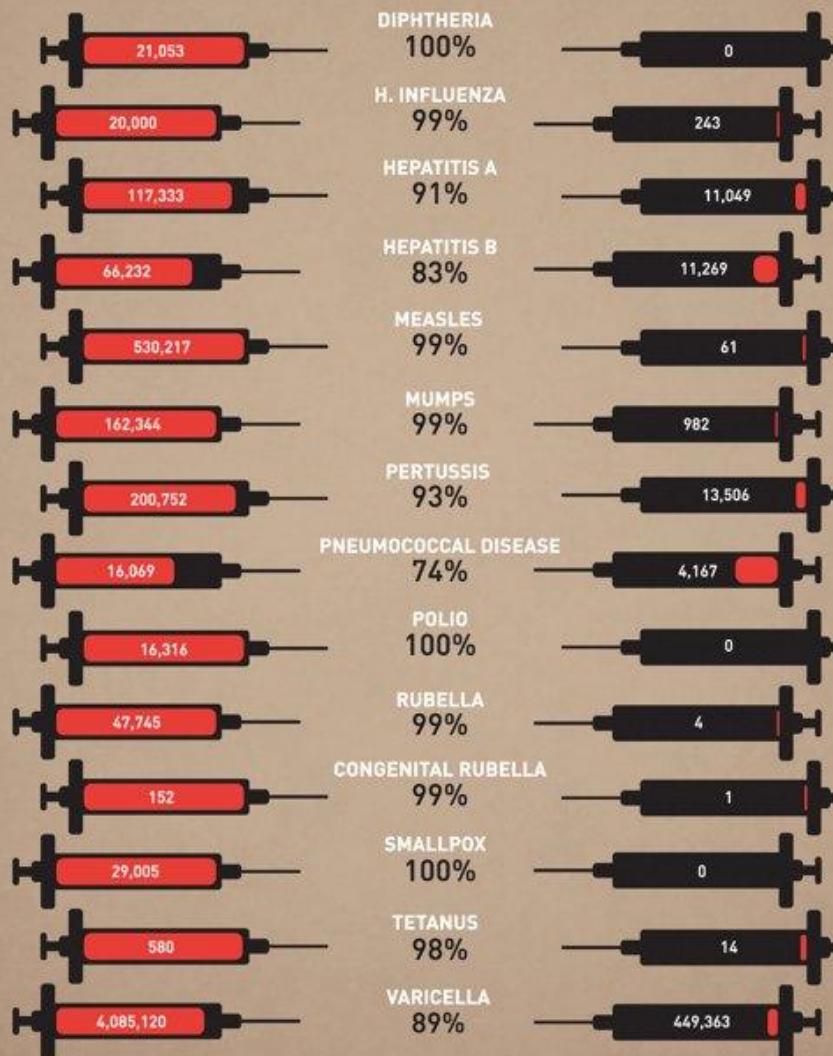




PRE-VACCINE ERA  
ESTIMATED ANNUAL  
MORBIDITY IN THE U.S.

%  
DECREASE

MOST RECENT  
REPORTS OF  
CASES IN THE U.S.



Search for

in All Fields

GO

Advanced Search

Home | Journals | Content Collections | Multimedia | Conferences | Information for | Submit

The Lancet, Volume 351, Issue 9103, Pages 637 - 641, 28 February 1998  
doi:10.1016/S0140-6736(97)11096-0 

< Previous Article | Next Article >

This article was retracted

Copyright © 1998 Elsevier Ltd All rights reserved.

## RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

Dr AJ Wakefield FRCS <sup>a</sup> , SH Murch MB <sup>b</sup>, A Anthony MB <sup>a</sup>, J Linnell PhD <sup>a</sup>, DM Casson MRCP <sup>b</sup>, M Malik MRCP <sup>b</sup>, M Berelowitz FRCPsych <sup>c</sup>, AP Dhillon MRCPPath <sup>a</sup>, MA Thomson FRCP <sup>b</sup>, P Harvey FRCP <sup>d</sup>, A Valentine FRCR <sup>e</sup>, SE Davies MRCPPath <sup>a</sup>, JA Walker-Smith FRCP <sup>a</sup>

### Summary

#### Background

We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

#### Methods

12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

#### Findings

Onset of behavioural symptoms was associated, by the parents, with measles, mumps, and rubella vaccination in eight of the 12

**RETRACTED**

# ANIMALISTI CONTRO RICERCATORI: CONTRAPPOSIZIONE INSANABILE?



# È ANCHE QUESTIONE DI TERMINI

## Sperimentazione animale

Sperimentazione  
(in ambito biomedico, farmacologico,  
fisiologico, fisiopatologico e biologico)  
a scopo di studio e ricerca su animali da  
laboratorio

**ATTENZIONE !**

Vivisezione  
**crimine**

# I MODELLI DELLA RICERCA

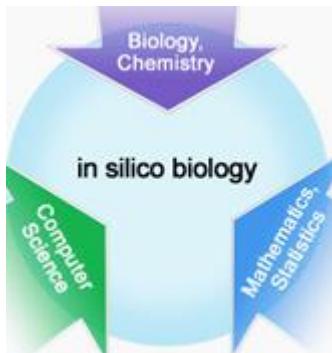
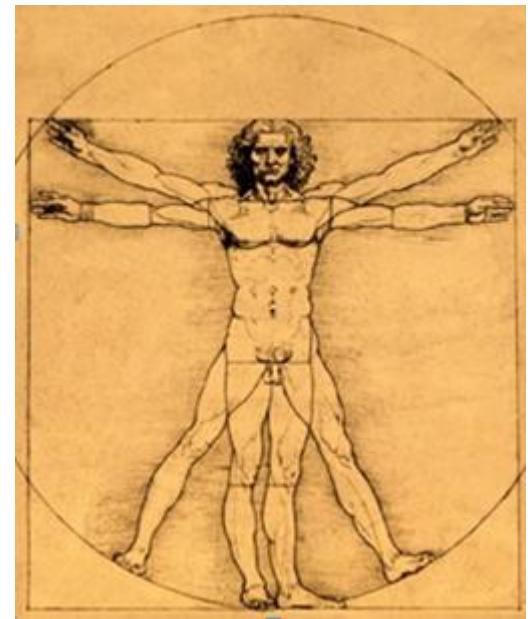
In vitro / in silico



in vivo



in clinica



# ANIMALI UTILIZZATI NELLA RICERCA BIOMEDICA IN ITALIA

	1998	2009	
Totale	1.099.491 (100%)	830.453 (100%)	-24%
Topi/Ratti	1.040.731 (95%)	767.637 (92%)	-26%
Cani	876 (0,08%)	607 (0,07%)	-31%
Scimmie	427 (0,04%)	416 (0,05%)	-3%
Gatti	89 (0,01%)	0 (0%)	-100%
Conigli	22.920 (1,04%)	8.657 (1,0%)	-62%
Pesci	2.066 (0,19%)	14.958 (1,8%)	+624%

principio delle  
tre R

W. M. Russel e R. L.  
Burch (1959)

Replacement  
Refinement  
Reduction

Fonte Ministero della Salute, ultimi dati disponibili

# COM'È REGOLAMENTATA LA Sperimentazione Animale?

**Direttiva Europea 2010/63/CE sulla Sperimentazione Animale**

Recepita da 19 dei 28 stati membri



**Recepimento Italiano – estate 2013**

**26 giugno:** La XIV Commissione del Senato approva un emendamento che propone un nuovo testo per il recepimento della direttiva 2010/63/UE

**31 luglio:** La Camera approva la versione del provvedimento proposta dal Senato, senza apportarvi modifiche

**6 agosto:** La legge viene pubblicata in Gazzetta Ufficiale. Il testo è invariato rispetto a quello approvato dal Senato

# **GLI EMENDAMENTI ITALIANI LE RICADUTE SULLA RICERCA**

## **Divieto per procedure che non prevedono anestesia o analgesia**

Si applica anche nel caso di semplici prelievi o di indagini incompatibili con l'anestesia

## **Divieto di utilizzo di animali per gli xenotraiani**

Ricadute su: trapianti umani, ricerca sul cancro, sviluppo di terapie cellulari

## **Divieto di utilizzo di animali per le ricerche su sostanze d'abuso**

Ricadute su: ricerca su effetti di nuove sostanze d'abuso, astinenza da sostanze d'abuso e disturbi alimentari, ecc.

## **Divieto di utilizzo di animali negli ambiti sperimentali e di esercitazioni didattiche**

Ostacoli alla formazione professionale e alla libera circolazione dei ricercatori, delle conoscenze scientifiche e delle tecnologie

## **Divieto di allevamento di cani, gatti e primati non umani destinati alla sperimentazione**

Divieto in contrasto con la libertà d'impresa, il diritto di esercitare un lavoro o un'attività professionale e di conseguenza con il diritto di stabilimento

# LA RICHIESTA DEI RICERCATORI



ANSA 19 settembre 2013

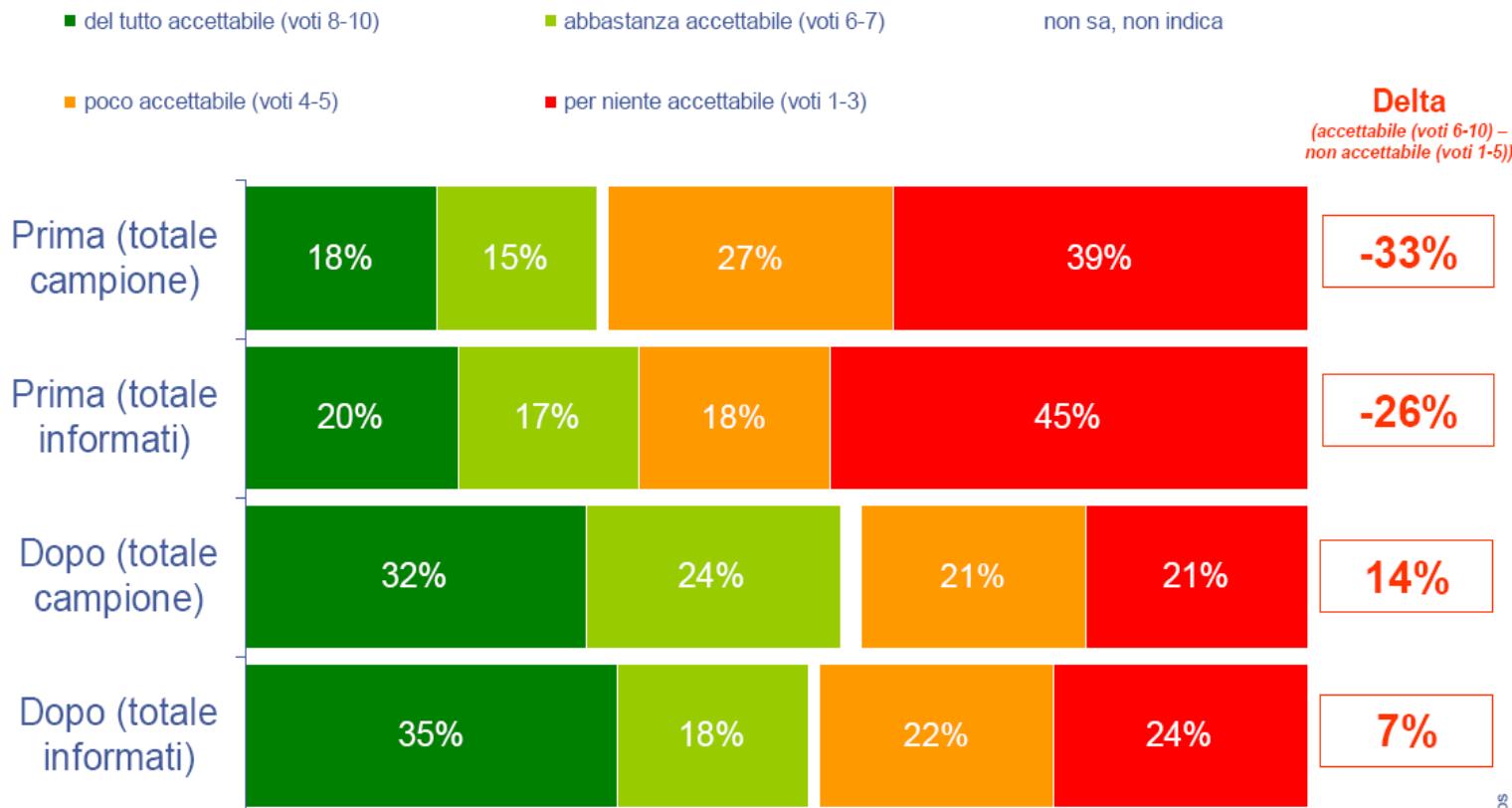
*La protesta dei ricercatori in piazza a Montecitorio*

→ ritornare al testo originario della direttiva

# IL LIVELLO DI INFORMAZIONE CAMBIA L'OPINIONE DELLE PERSONE



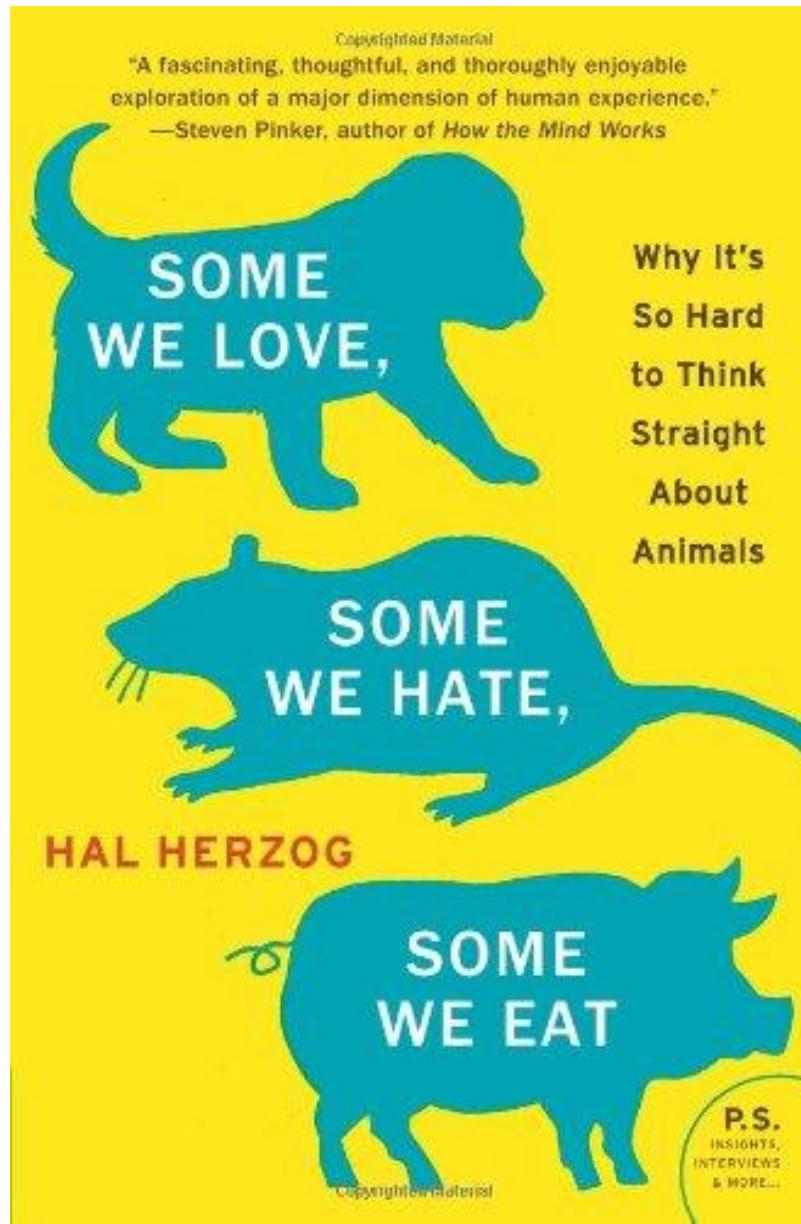
**La sperimentazione scientifica sugli animali. Quanto è accettabile prima e dopo alcune informazioni?**



Una volta informati, gli intervistati cambiano decisamente opinione riguardo al livello di accettabilità della sperimentazione scientifica sugli animali. Se prima era il 33% degli italiani a ritenerla accettabile, dopo è il 56% del campione ad essere di questa opinione.

© 2011 Ipsos

# ANTRO-ZOOLOGIA: LE CAVIE SIAMO (ANCHE) NOI !



# Timeline: The Three Revolutions

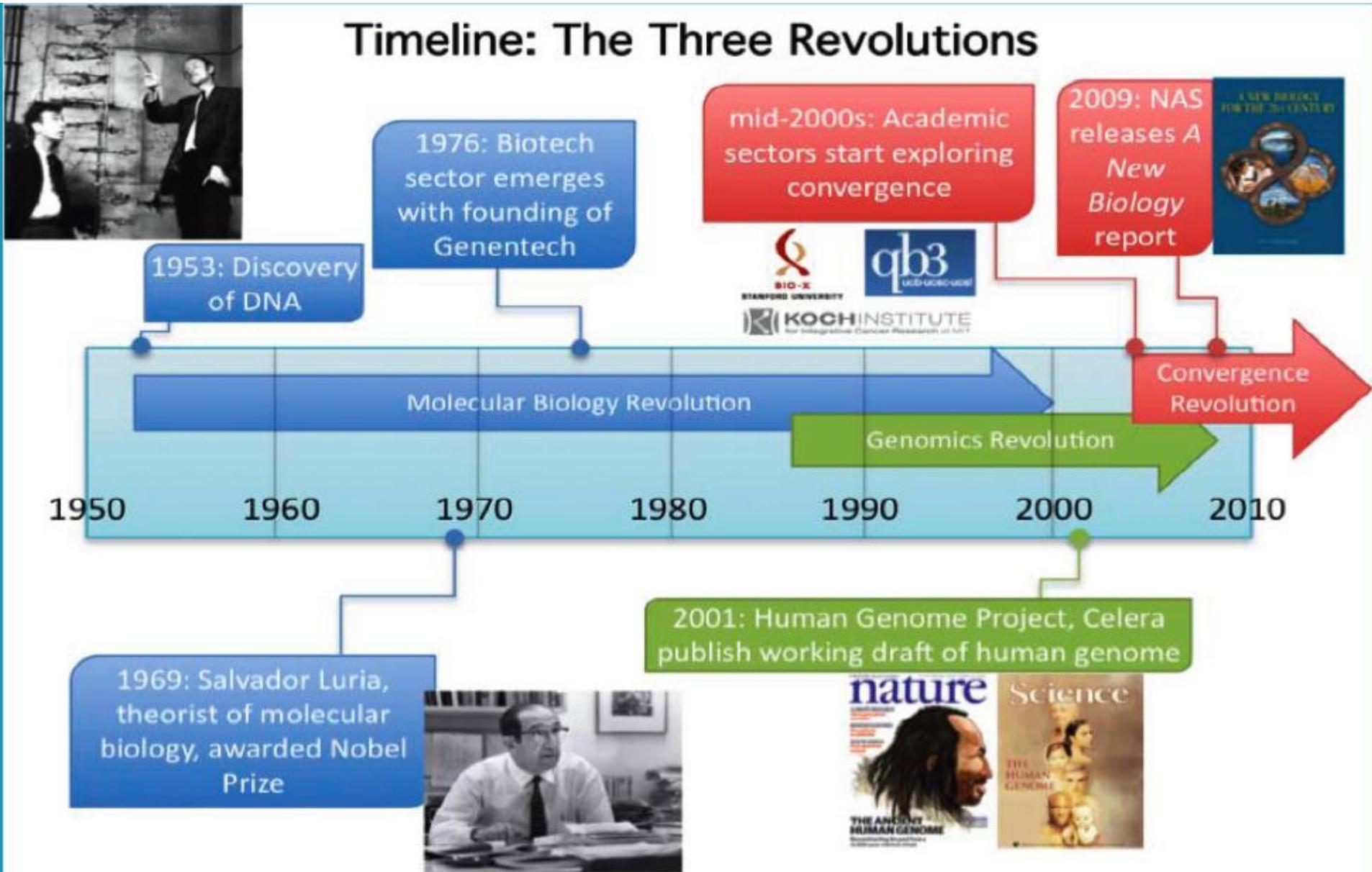
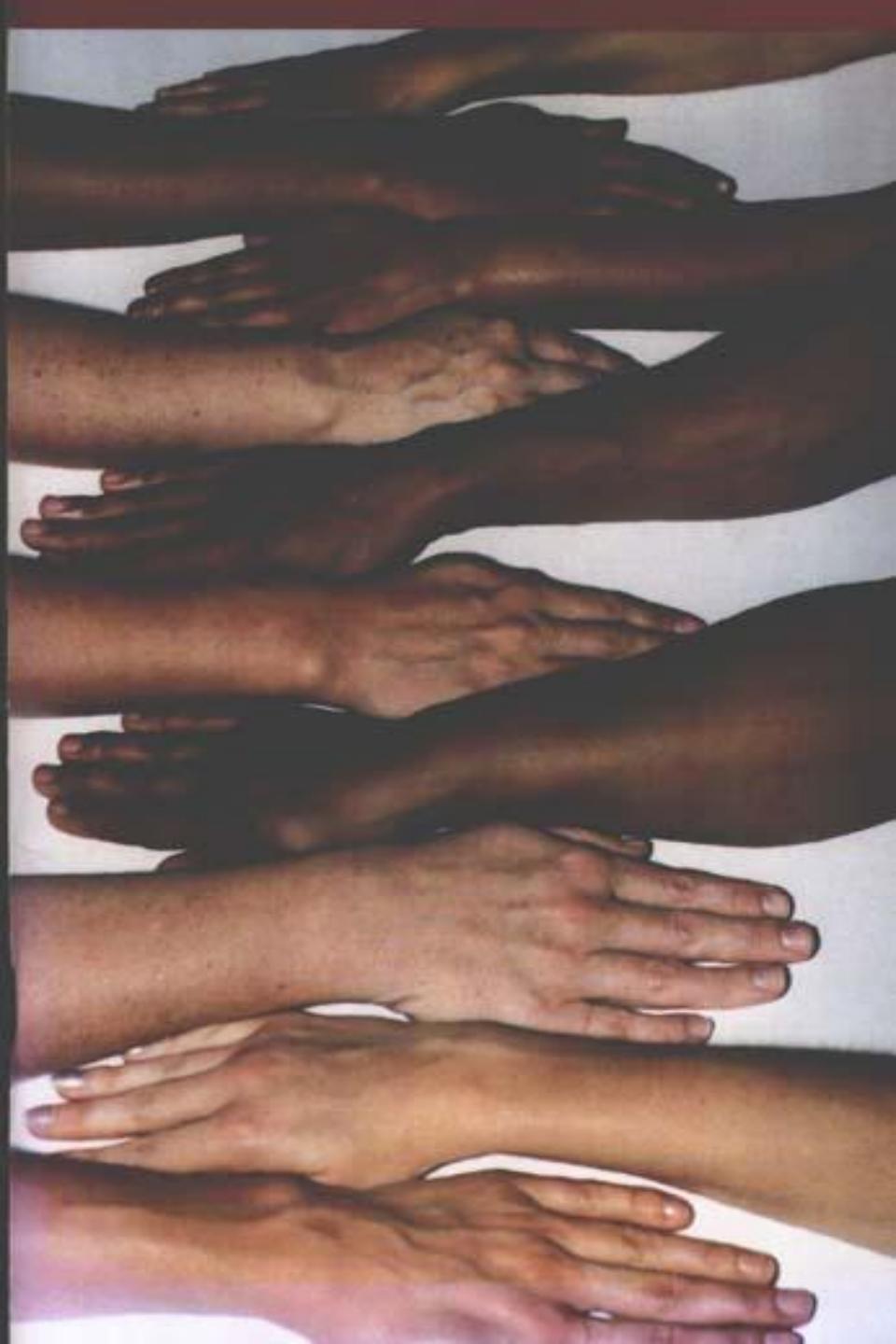
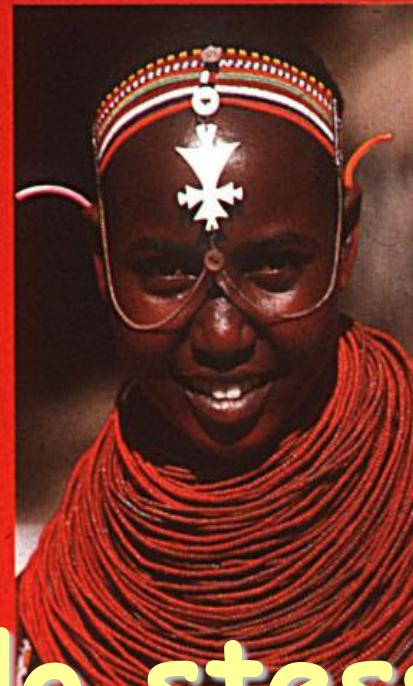
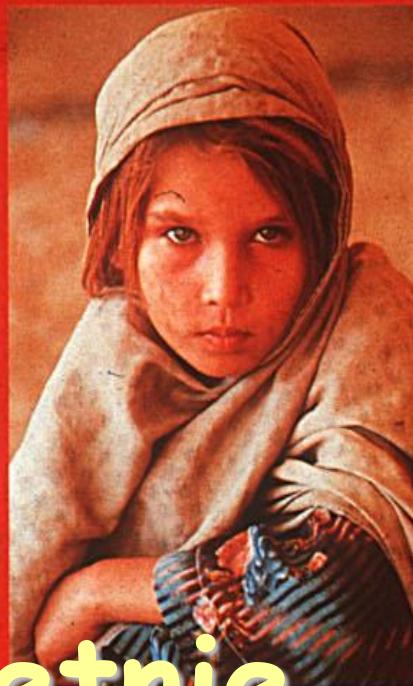
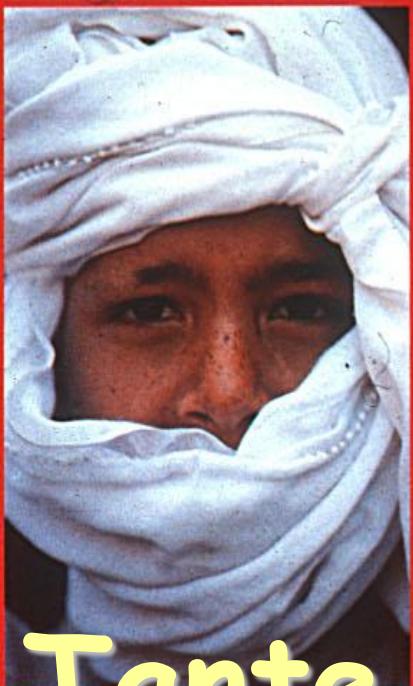
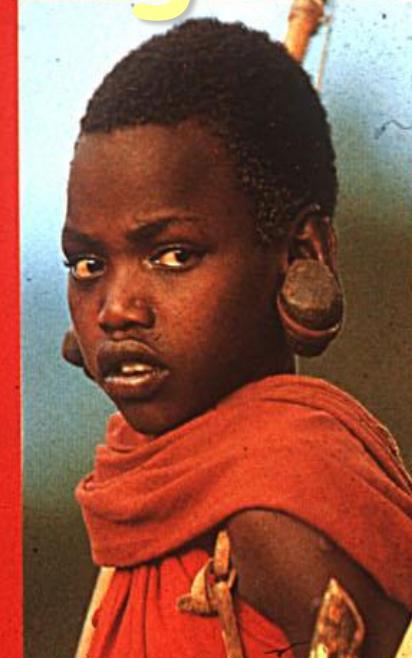


Image and info credits (clockwise from top-left): DNAmazing.com, Gene.com, BioX.stanford.edu, qb3.org, mit.edu/ki, nap.edu, sciencemag.org, nature.com, nlm.nih.gov

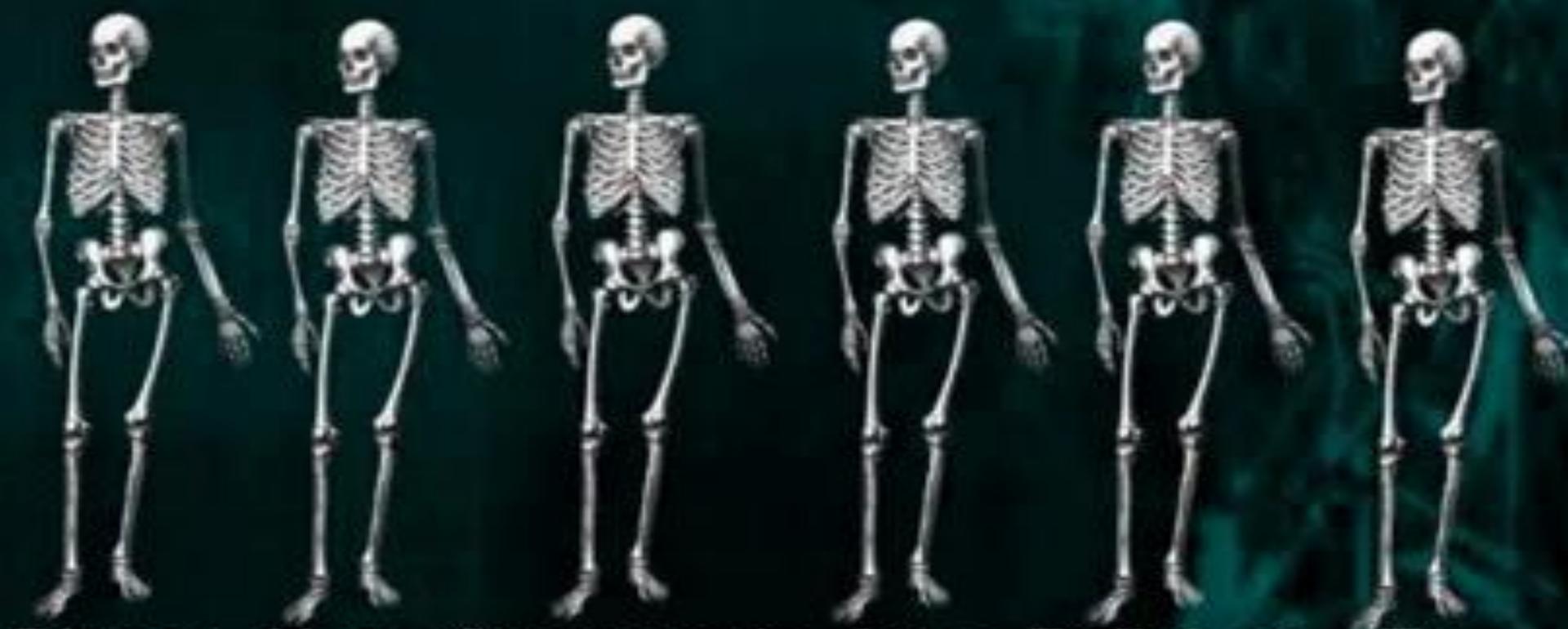




Tante etnie ... lo stesso genoma



# DIFFERENZE



Bianco Nero Omosessuale Ateo Religioso Tu

Il che medesmo si può considerare  
ne le cose artificiali, in tanto che chi vede la statua, non  
vede il scultore; chi vede il ritratto di Elena, non vede  
Apelle, ma vede lo effetto de l'operazione che proviene  
da la bontà de l'ingegno d'Apelle; il che tutto è uno  
effetto de gli accidenti e circostanze de la sustanza di  
quell'uomo il quale, quanto al suo essere assoluto, non  
è conosciuto punto.<sup>14</sup>

Giordano Bruno

DE LA CAUSA, PRINCIPIO E UNO

opera nella quale anticipa anche il “principio cosmologico” di Einstein !

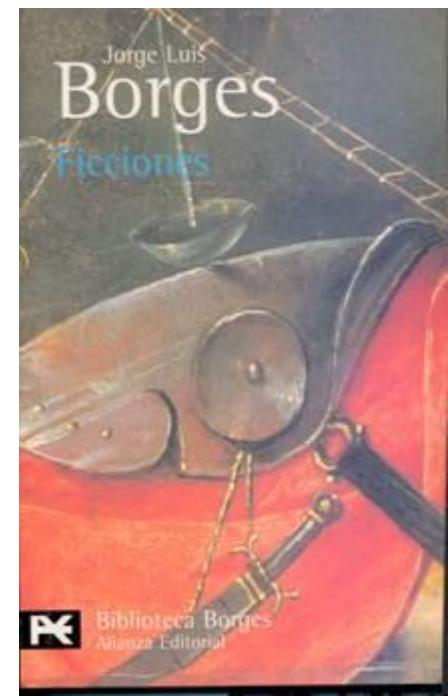
...l'universo appare nello stesso modo da qualunque punto ed in qualunque direzione lo si osservi...

# La Biblioteca de Babel

*By this art you may contemplate the variation of the 23 letters...*

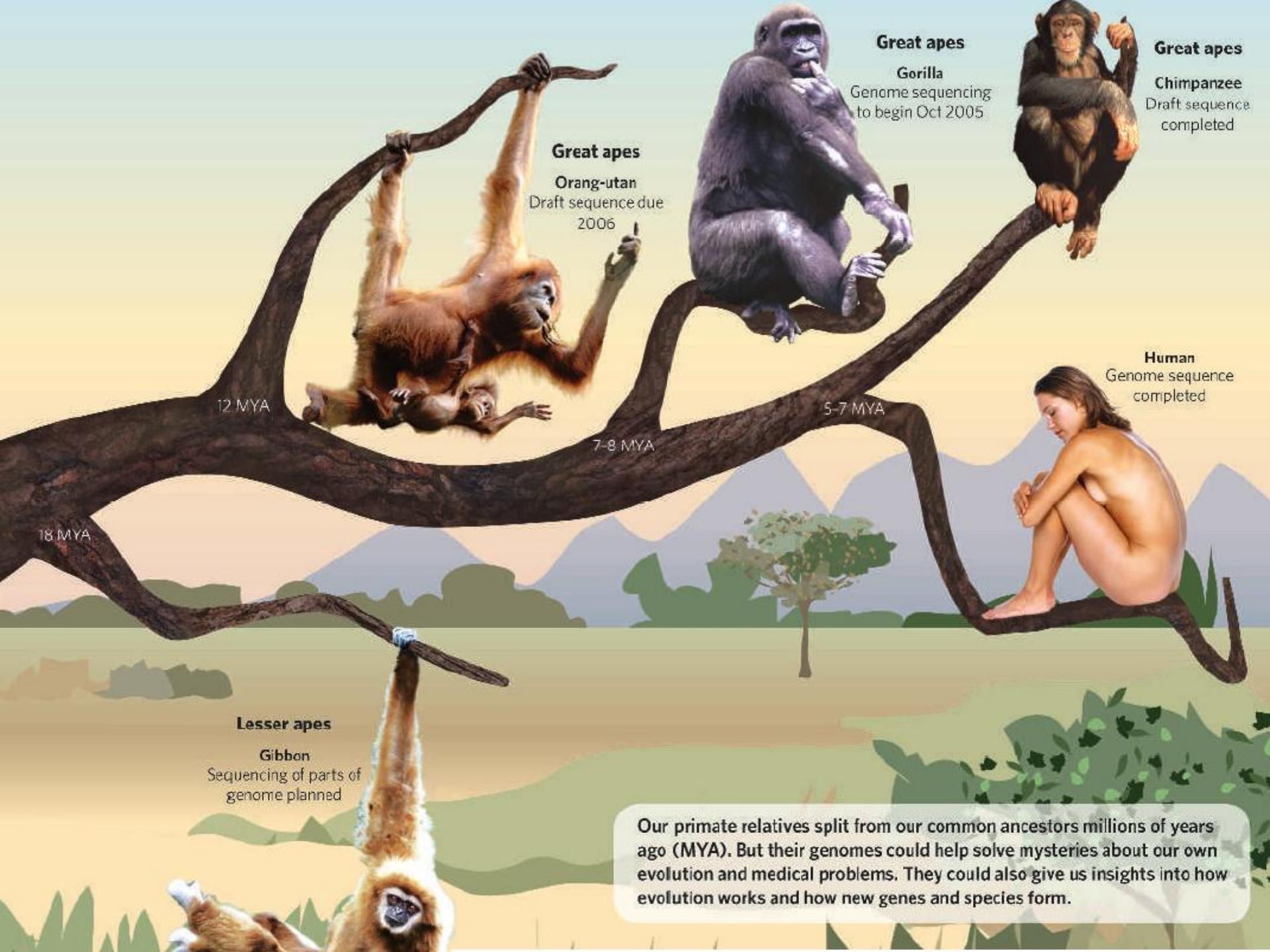
*The Anatomy of Melancholy*, part. 2,  
sect. II, mem. IV.

El universo (que otros llaman la Biblioteca) se compone de un número indefinido, y tal vez infinito, de galerías hexagonales, con vastos pozos de ventilación en el medio, cercados por barandas bajísimas. Desde cualquier hexágono, se ven



Biblioteca Borges  
Anaya Editorial







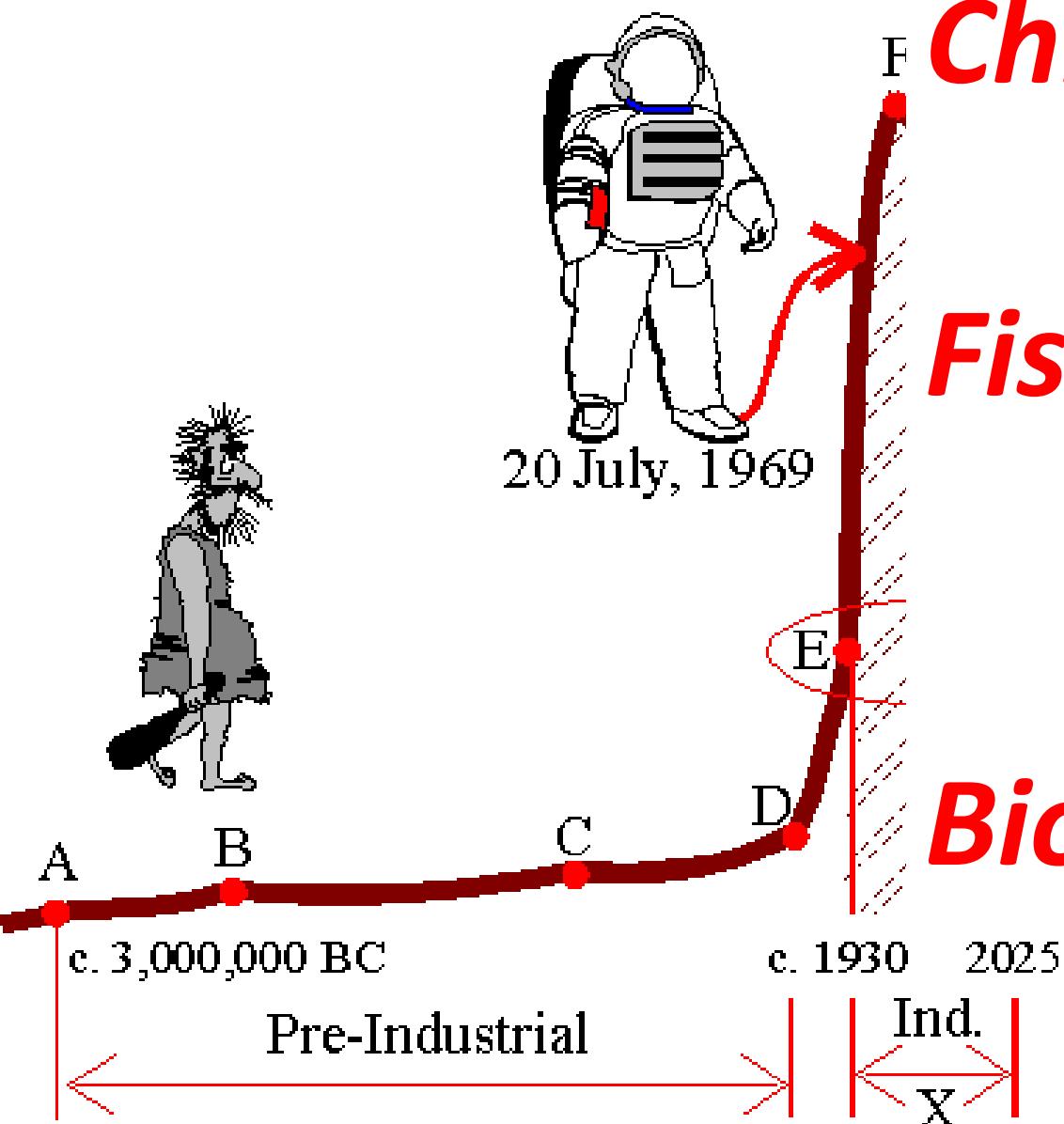
# The *Neanderthal* *in the family*



*Chimica ('800)*

*Fisica ('900)*

*Bio 2000 - ...!!*



JANUARY 18, 2010

Joe Klein:  
The CIA's  
Afghan Disaster

Yemen: The  
New Center  
Of Terror

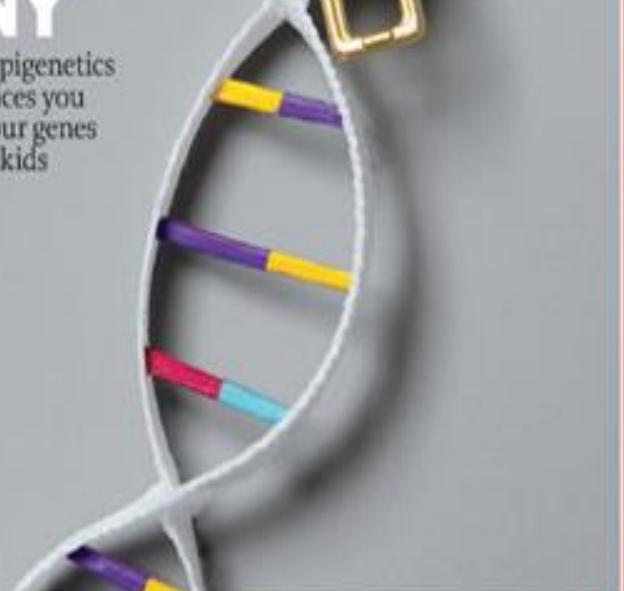
Why the Recession  
Hasn't Been Cool  
To Teens

# TIME

## WHY YOUR DNA ISN'T YOUR DESTINY

The new science of epigenetics reveals how the choices you make can change your genes—and those of your kids

BY JOHN CLOUD



# genotype and phenotype

A close-up view of a DNA sequence, showing a series of letters representing the bases adenine (A), thymine (T), cytosine (C), and guanine (G). A red diamond highlights a specific sequence of bases, drawing attention to a particular point of interest within the genetic code.







**Josh Charles: The Peabody Library at Mount Vernon Place**

(Josh Charles, actor in CBS drama "The Good Wife", Emmy nomination)



Jackson  
photography

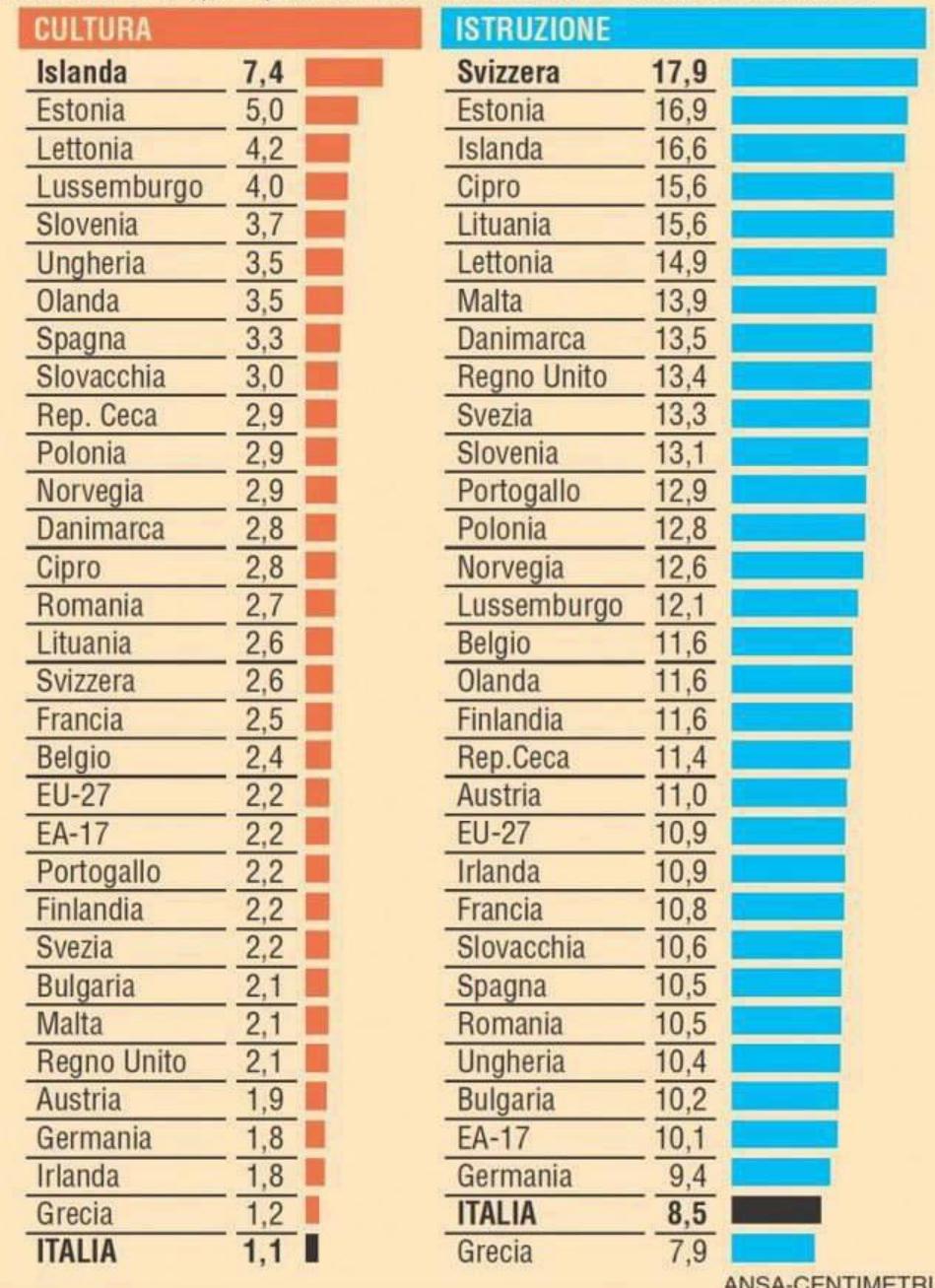
**CULTURA  
QUANDO?**



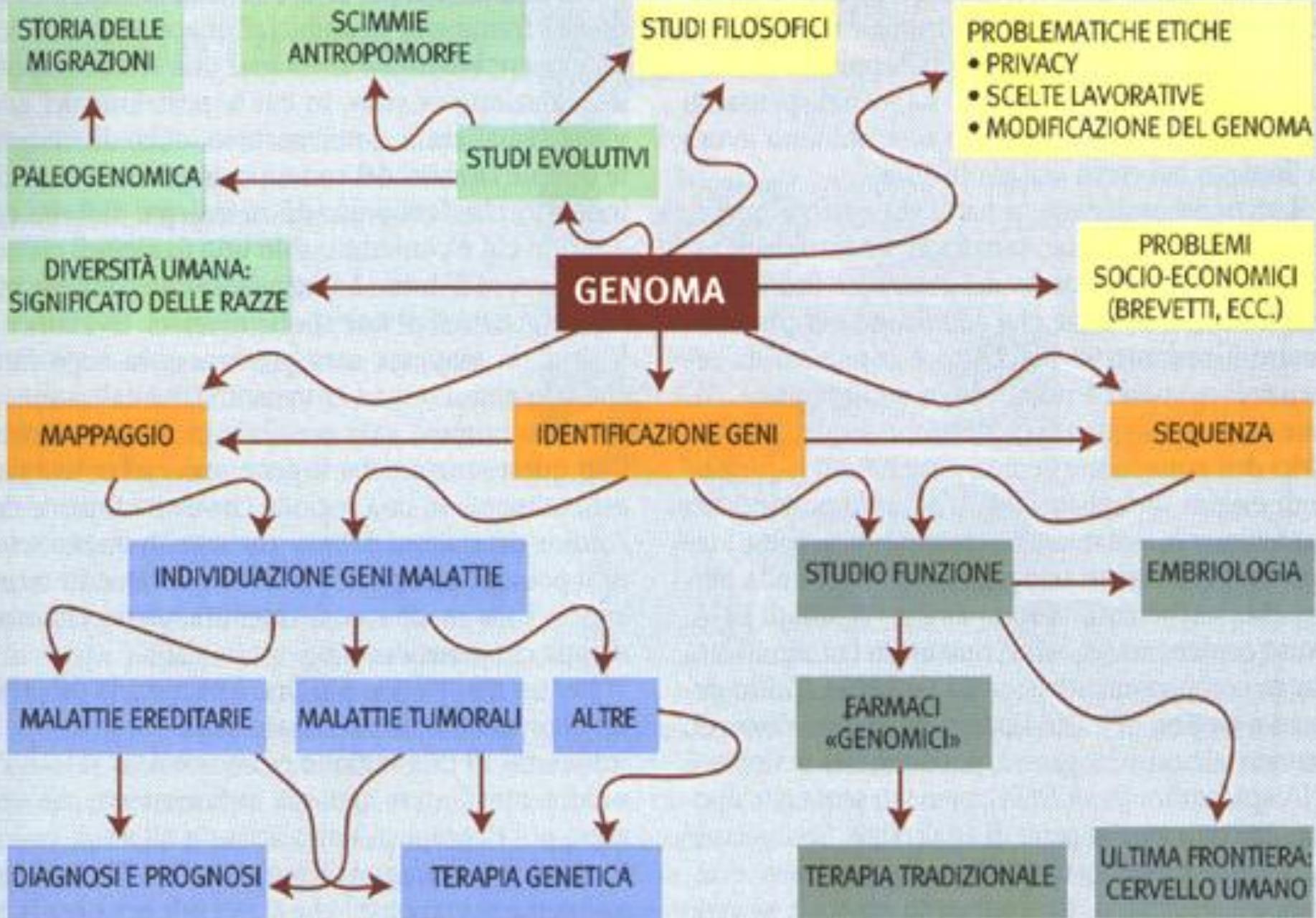


# Così in Europa

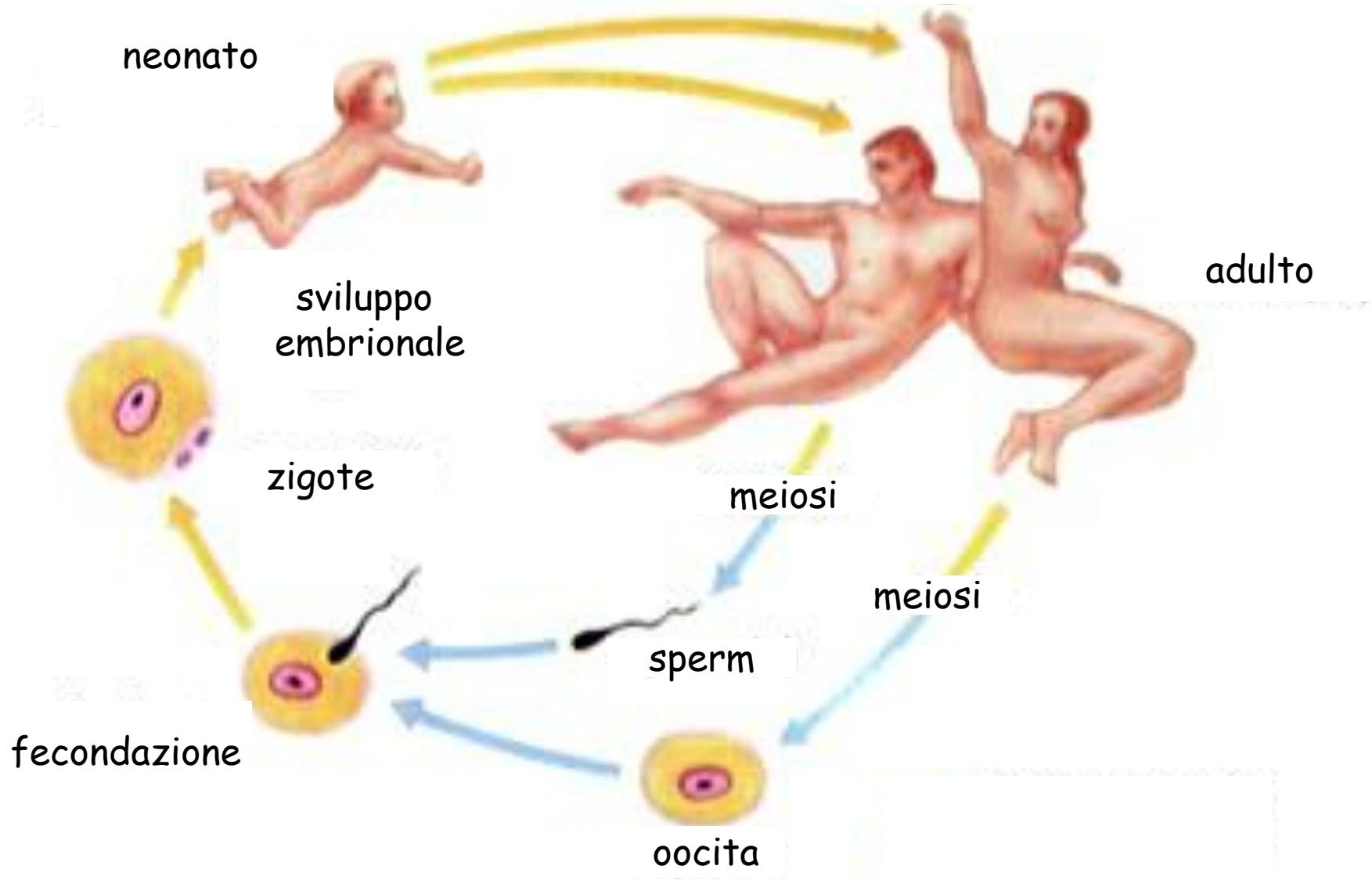
Percentuale di spesa pubblica destinata a cultura e istruzione. Dati 2011



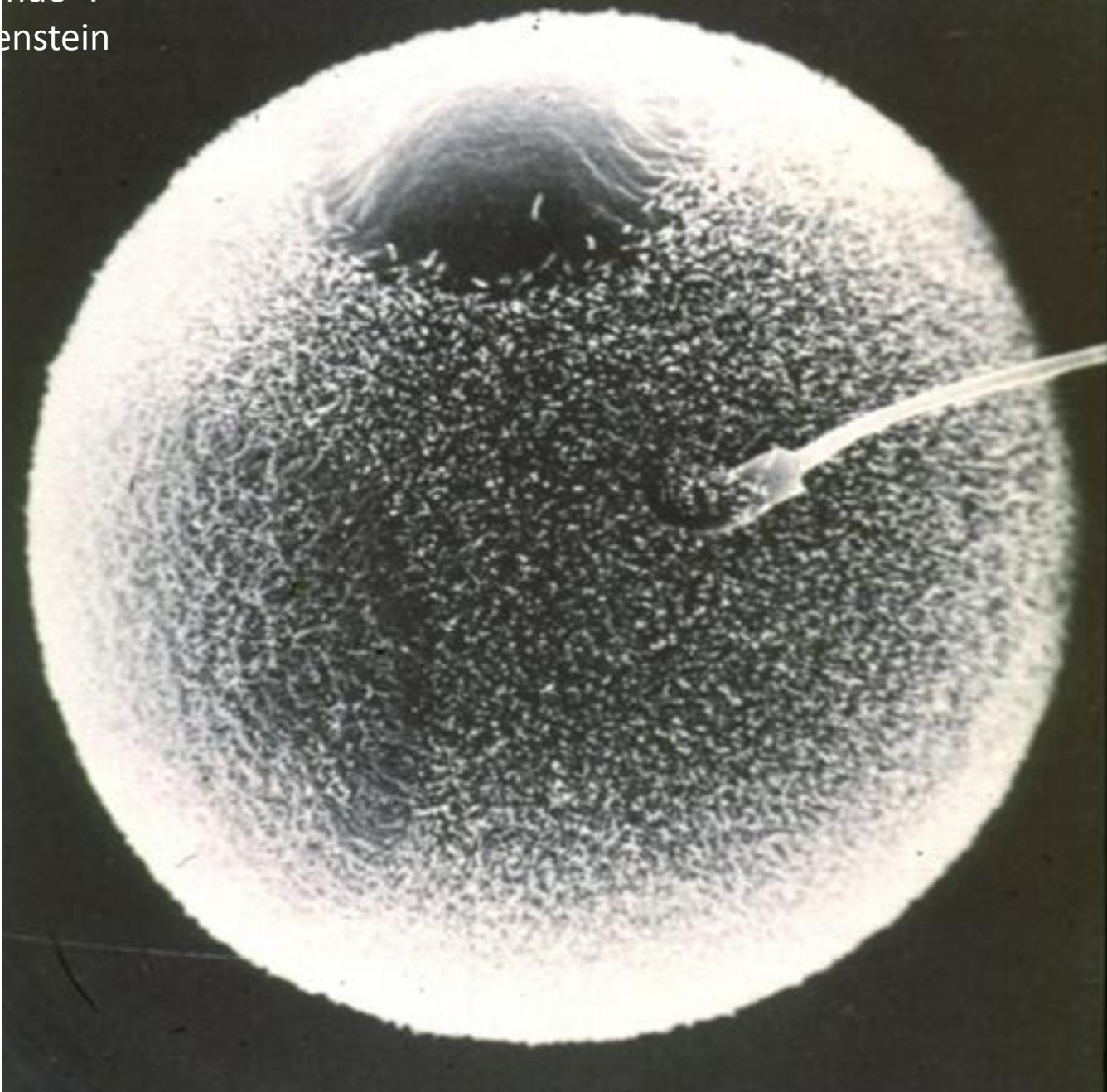
ANSA-CENTIMETRI



## Crescita e differenziamento



gica non è, naturalmente, la "Vita". E nemmeno la vita psicologica.  
ndo».  
enstein



Jeremy Cherfas  
and  
John Gribbin

The  
Redundant  
Male



# THE END OF MEN

AND THE RISE OF WOMEN

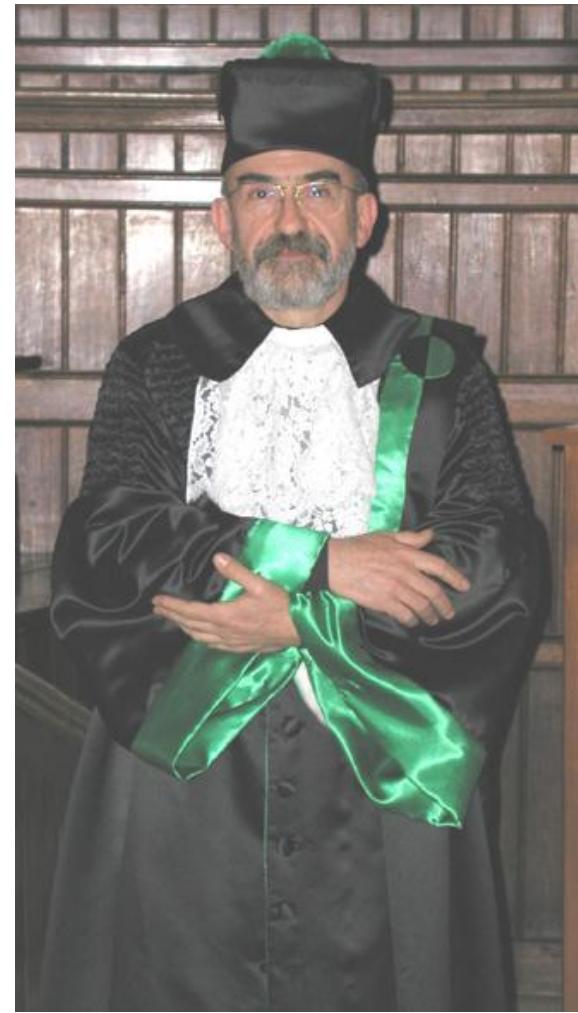
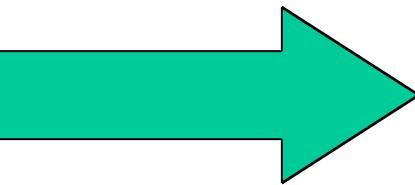
HANNA ROSIN





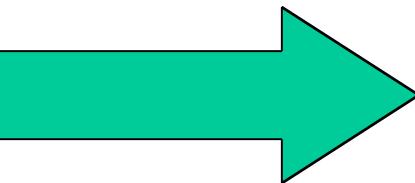






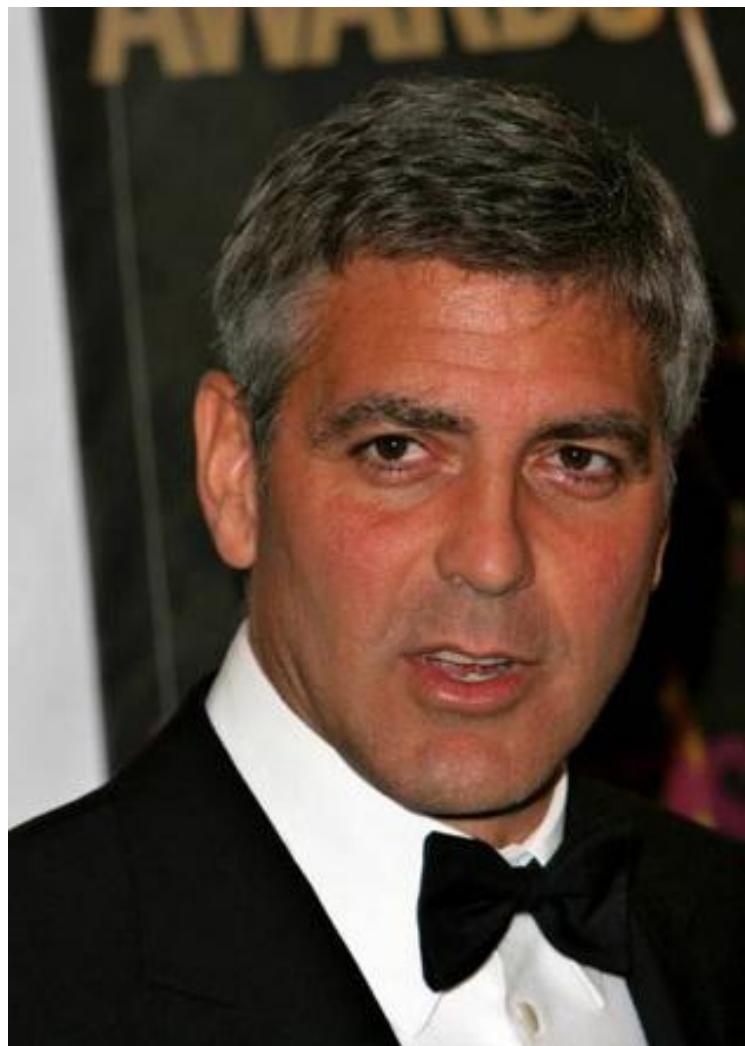
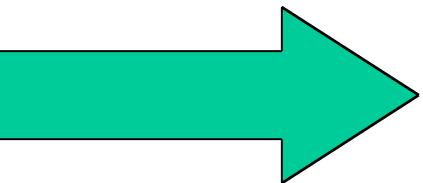
1

$10^{15}$



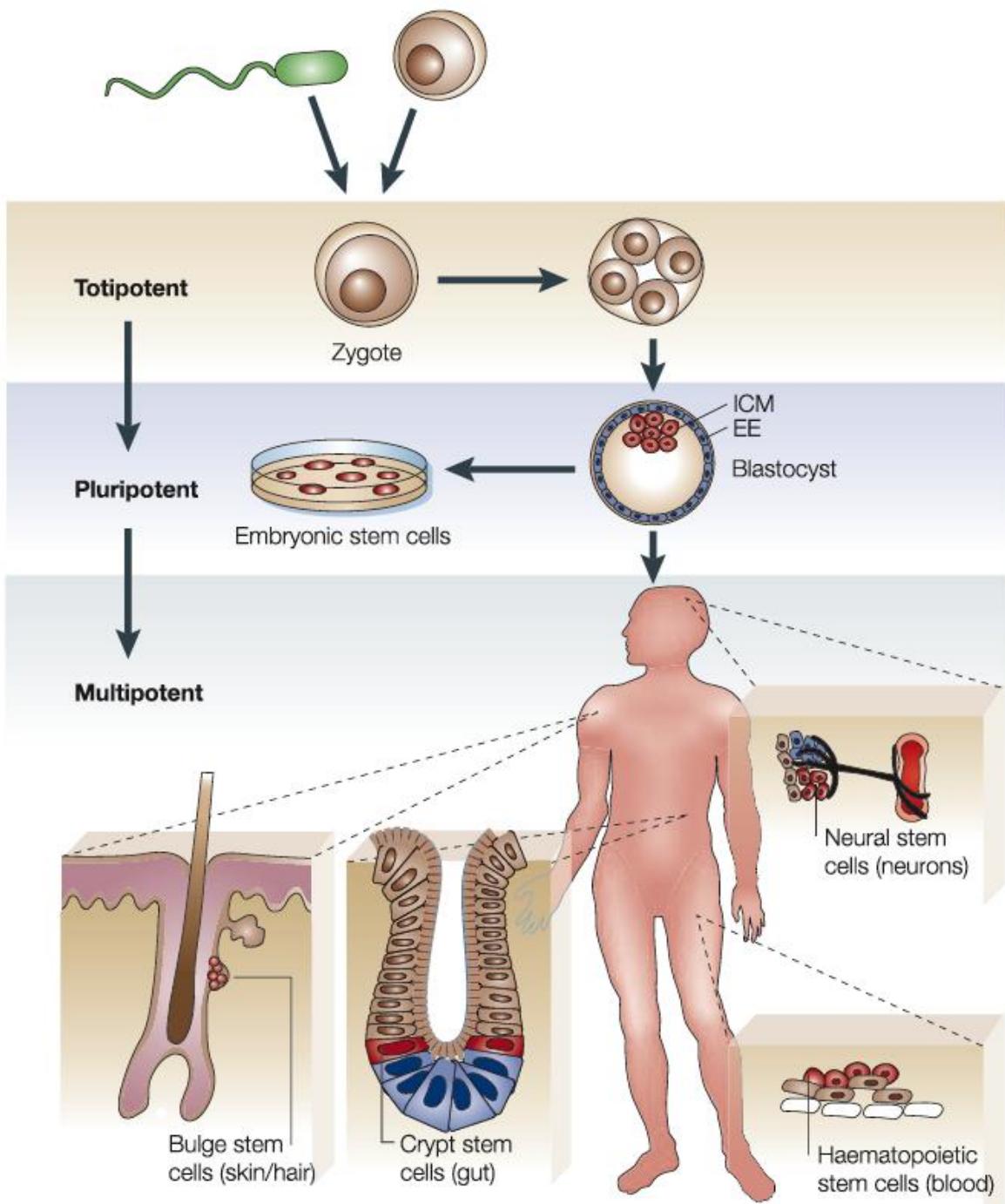
1

$10^{15}$



1

$10^{15}$

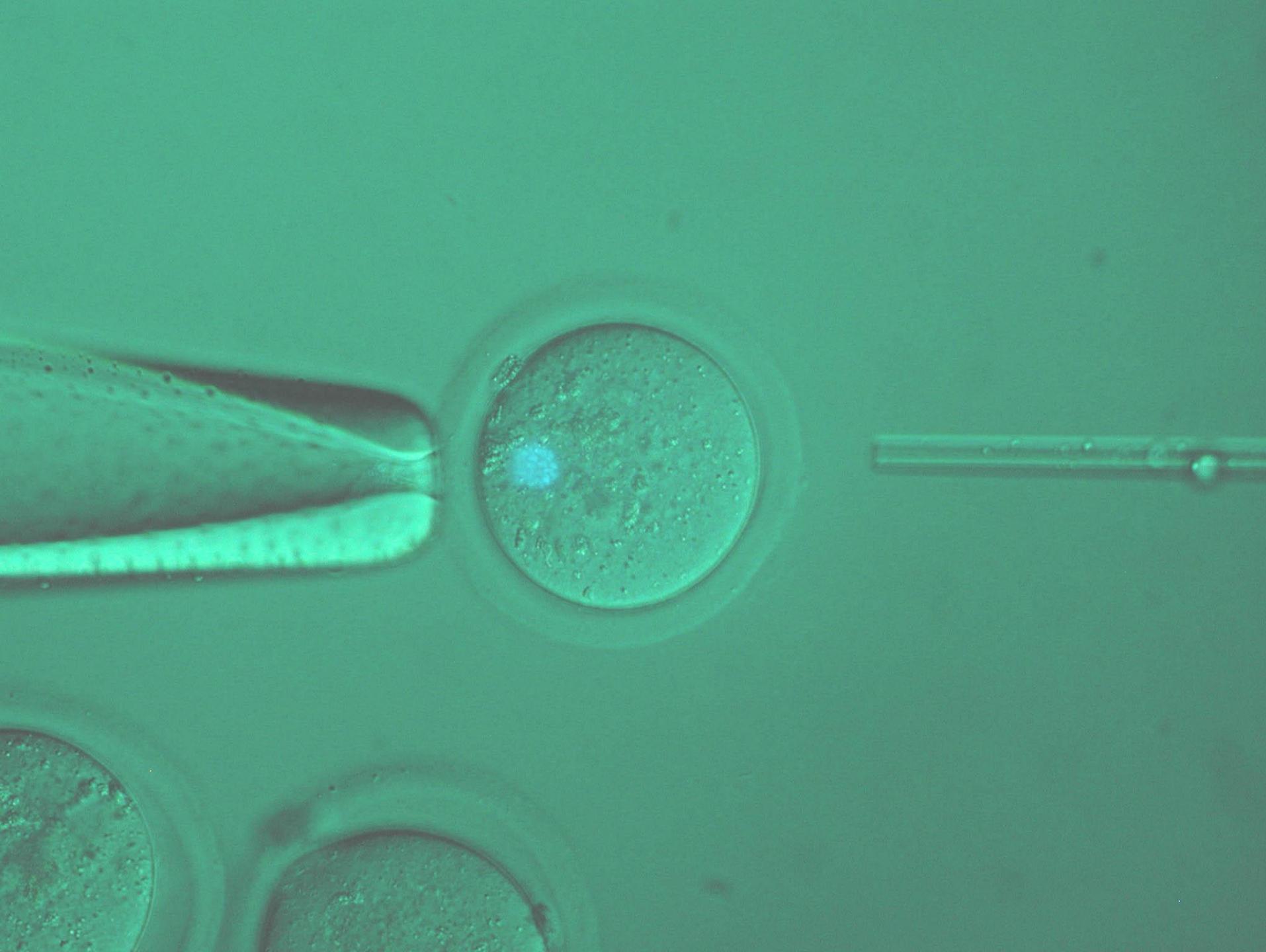




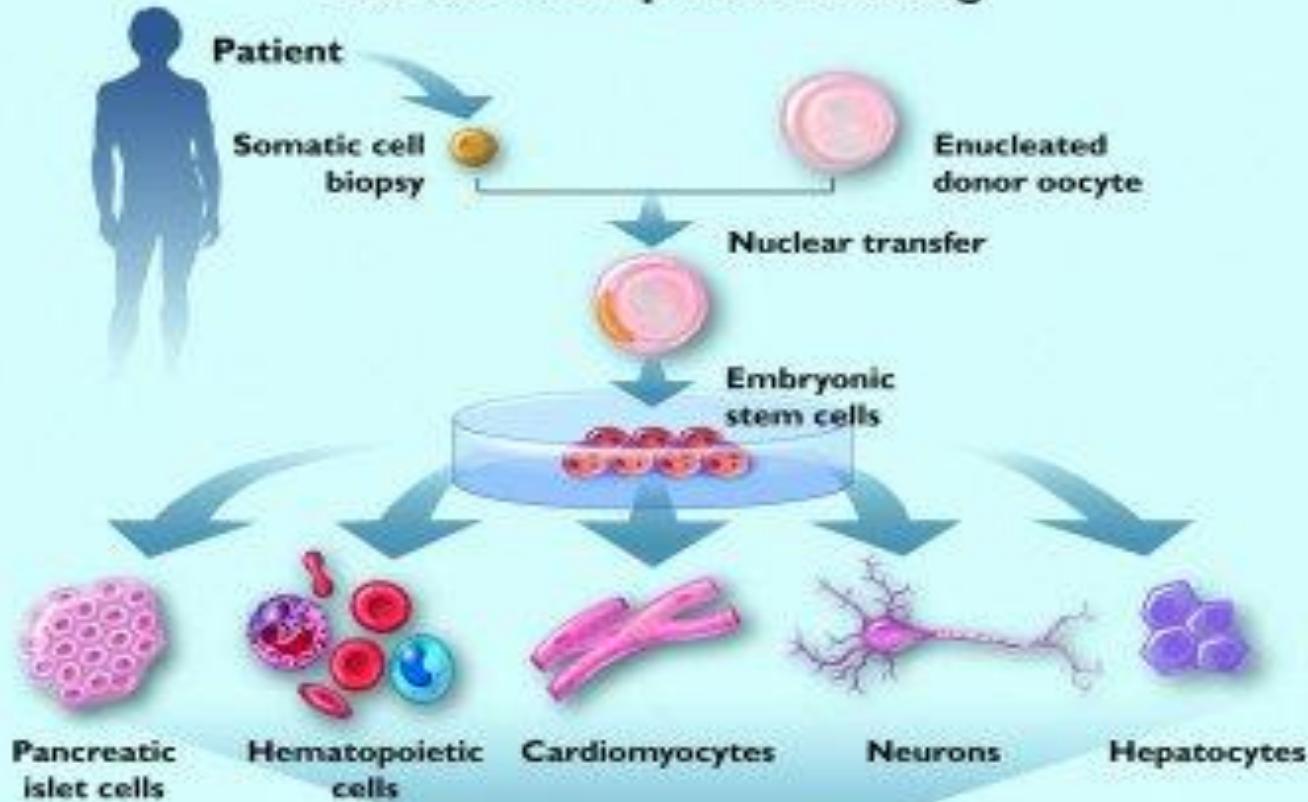
# Hans Spemann

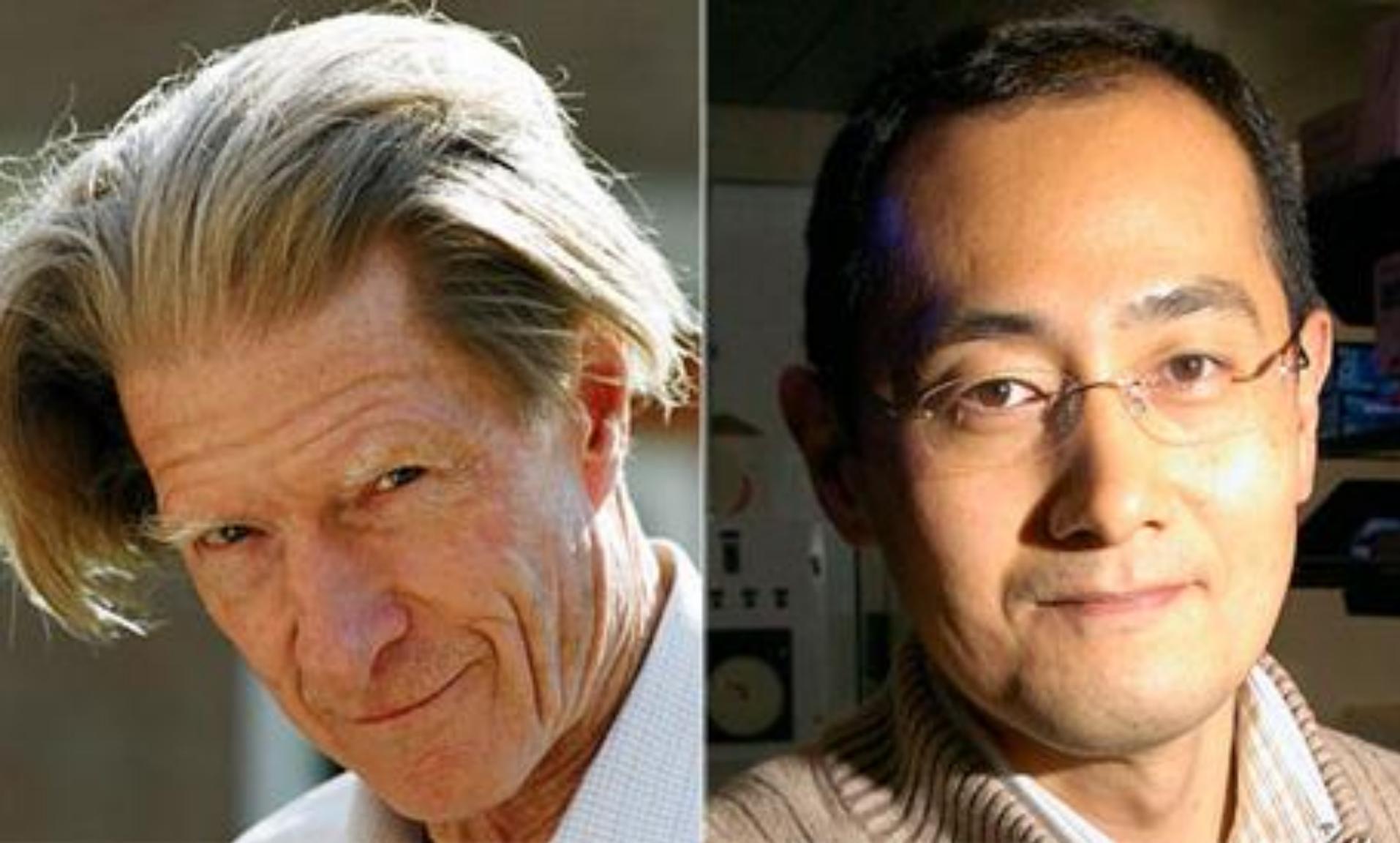
(1869 - 1941)

1938 - Cloning is envisioned a "fantastical experiment".

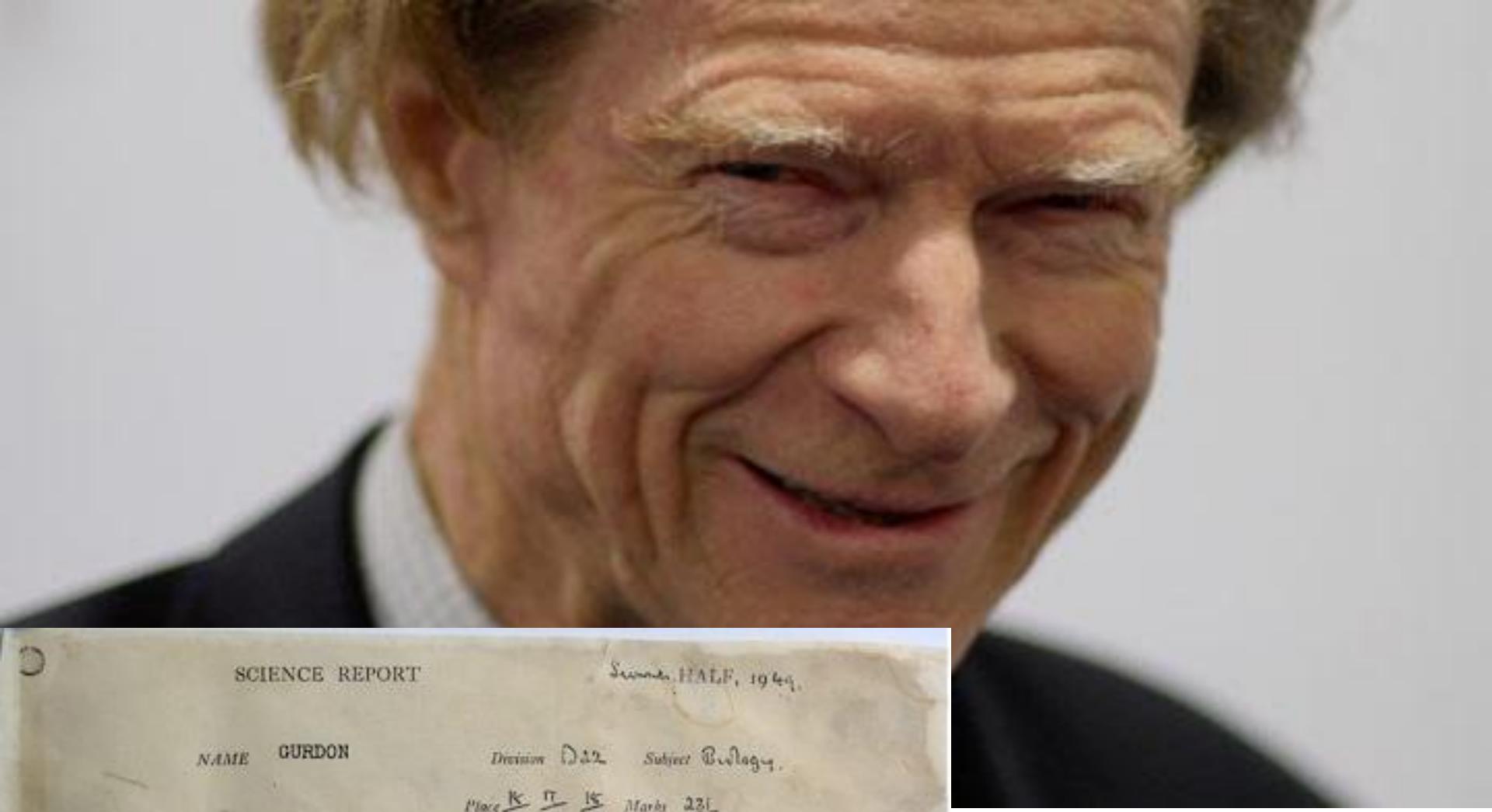


# Human Therapeutic Cloning





John Gurdon (left) and Shinya Yamanaka  
showed how to reprogram cells into their embryonic states



## SCIENCE REPORT

Summer HALF, 1949.

NAME GURDON

Division D12 Subject Biology.

Place  $\frac{K}{14}$   $\frac{H}{14}$   $\frac{K}{14}$  Marks  $\frac{23L}{55B}$ 

It has been a disastrous half. His work has been far from satisfactory. His prepared stuff has been badly learnt, and several of his test pieces have been torn over; one of such pieces of prepared work scored 2 marks out of a possible 50. His other work has been equally bad, and several times he has been in trouble, because he will not listen, but will insist on doing his work in his own way. I believe he has ideas about becoming a Scientist; on his present showing this is quite ridiculous, if he can't learn simple Biological facts he would have no chance of doing the work of a Specialist, and it would be sheer waste of time, both on his part, and of those who have to teach him.

(Signature)







Anthony Atala's team  
at the Wake Forest Institute for Regenerative Medicine  
in Winston-Salem, North Carolina

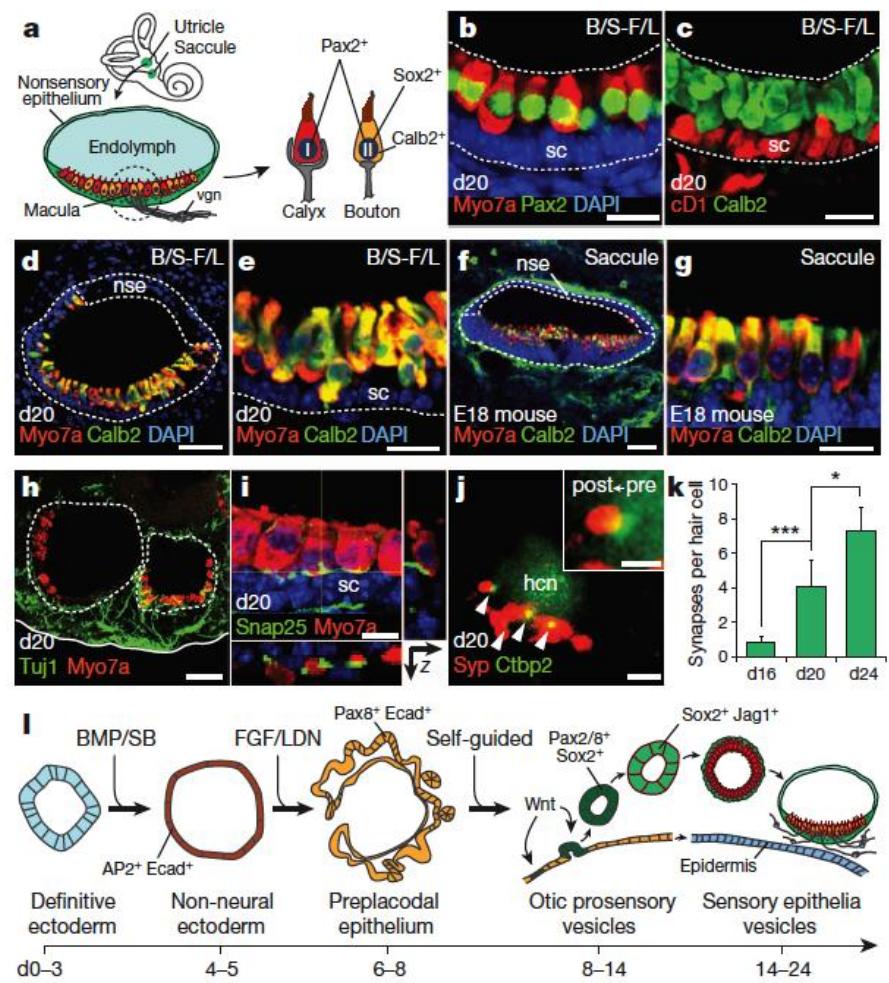


Figure 4 | Stem-cell-derived sensory epithelia are comparable to immature vestibular end organs. **a**, Schematic of vestibular end organs and type I/II

**LETTER**

8 AUGUST 2013 | VOL 500 | NATURE | 217

doi:10.1038/nature12298

## Generation of inner ear sensory epithelia from pluripotent stem cells in 3D culture

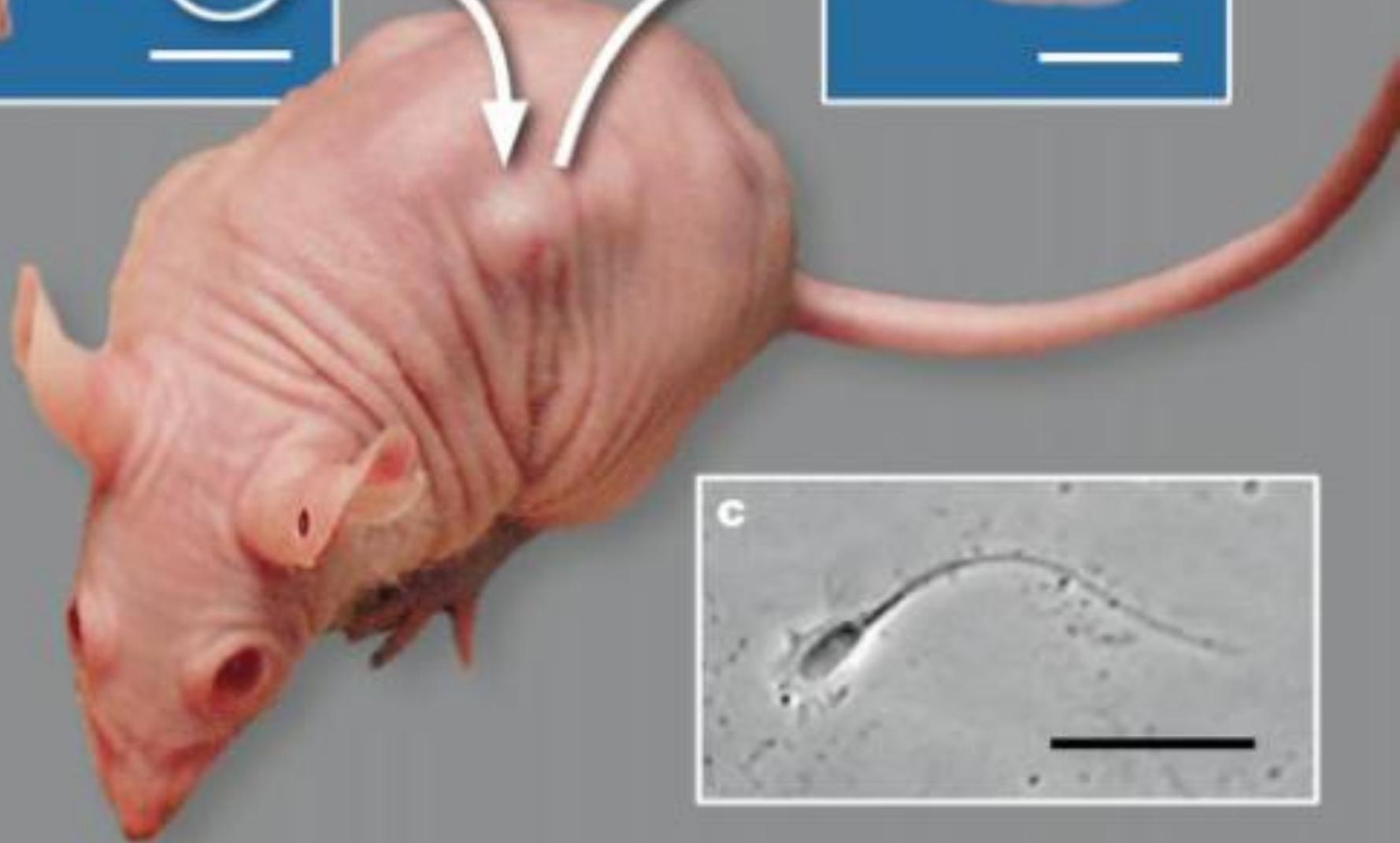
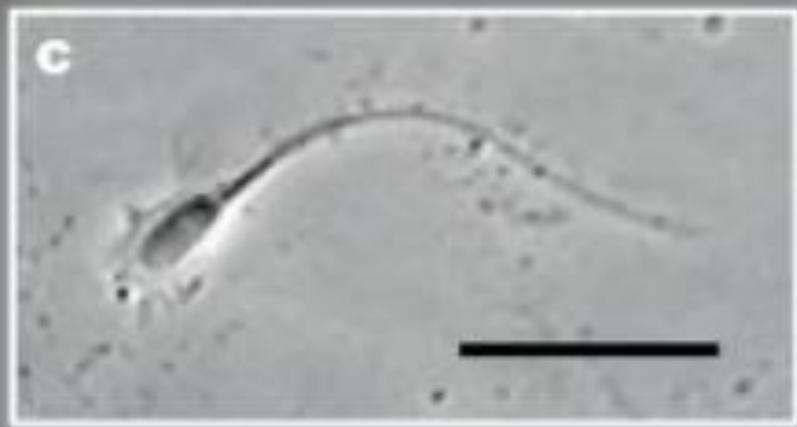
Karl R. Koehler<sup>1,2,3</sup>, Andrew M. Mikosz<sup>2,3</sup>, Andrei I. Molosh<sup>2,4</sup>, Dharmeshkumar Patel<sup>2,3</sup> & Eri Hashino<sup>1,2,3</sup>



**a**

## New sources of sex cells

Within the next decade or so, it will become possible to derive sperm and eggs from skin cells. The ethical and technical hurdles need to be addressed with the scientific and therapeutic benefits in mind.

**c**

Cesare Perotti è responsabile del settore aferesi e manipolazione cellulare del servizio di Immunonematologia e medicina trasfusionale della Fondazione IRCCS Policlinico San Matteo di Pavia.

Claudia Del Fante è dirigente medico del settore di Immunonematologia e medicina trasfusionale della Fondazione IRCCS Policlinico San Matteo di Pavia.

Carlo Alberto Redi è professore di Biotecnologie della riproduzione all'Università di Pavia; accademico dell'Incel e membro del Comitato Nazionale per la Biosicurezza, le biotecnologie e le scienze della vita.



MEDICINA

# Staminali dal cordone ombelicale

Il sangue prelevato dal cordone è un tesoro di cellule staminali usate per curare numerose malattie e come tutti i tesori ha attirato anche interessi privati, che però non hanno alcun fondamento terapeutico

di Cesare Perotti, Claudio Del Fante e Carlo Alberto Redi

## IN BRIEVE

Da circa vent'anni il cordone ombelicale è una fonte importante di cellule staminali per la cura di molte malattie, non solo del sangue, e non è più considerato uno scarto. Inoltre, progressi della biologia delle staminali hanno suggerito la

costituzione di banche del cordone dove caratterizzare le cellule staminali e metterle a disposizione dei pazienti. Oggi in Italia viene donato solo il cinque per cento dei cordoni, di cui solo un terzo circa è utilizzabile. In

totale nelle 18 banche italiane sono disponibili poco più di 20.000 cordoni per terapie dedicate non solo alle malattie del sangue. Solo la raccolta solidaristica (cioè la donazione a banche pubbliche) assicura un corretto uso terapeutico

delle staminali contenute nei cordoni, come sostiene dalle più autorevoli società scientifiche. Mentre la conservazione privata a uso personale è priva di ogni fondamento scientifico e terapeutico, ed è alimentata solo da fini commerciali.

Foto: G. Sartori - S. Sartori



Un medico afferra con le pinze il cordone ombelicale di un bambino che sta nascendo con il taglio cesareo. Cordone ombelicale e placenta contengono sangue ricco di cellule staminali.



**Conosci la GRANDE IMPORTANZA  
delle cellule staminali contenute nel  
sangue del cordone ombelicale del tuo bimbo?**

*Conservandole offri a tuo figlio la possibilita' di avere a disposizione  
per un lungo periodo di tempo cellule staminali vitali con ottime  
capacita' replicate.*

*Un gesto prezioso che puoi compiere solo al  
momento della sua nascita, un momento unico  
ed irripetibile!*



Conserva  
per tuo figlio le  
**cellule staminali**  
del sangue  
del cordone  
ombelicale  
**Il parto è l'unico  
momento**

Pochi passi  
insieme a noi  
**23 professionisti**  
saranno al tuo  
fianco ogni giorno

Al massimo  
entro 40 ore  
**7 giorni su 7**  
il campione arriva  
a InScientiaFides

**Siamo  
una biobanca**  
non siamo  
intermediari  
parla con noi!

### Richiedi maggiori informazioni





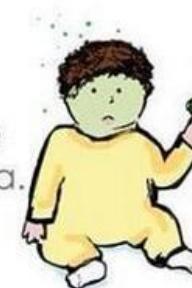
24

Accetto che InScientiaFides tratterà i  
miei dati personali in conformità al  
D.Leg.196/03

INVIA



Every baby  
knows the  
**scientific method!**

-  1 Make an observation.
-  2 Form a hypothesis.
-  3 Perform the experiment.
-  4 Analyze the data.
-  5 Report your findings.
-  6 Invite others to reproduce the results.

SI AL DIRITTO  
DI SCEGLIERE  
SI A STAMINA  
SI ALLA VITA

FORZA CHRY

I BIMBI  
NON SI  
TOCCANO



SI AL METODO  
MATTIA E LUCA  
E TUTTI GLI ALTRI  
VOGLIONO CONTINUARE

LUDOVICA FRANCHI



SI AL  
SI AL  
SI AL

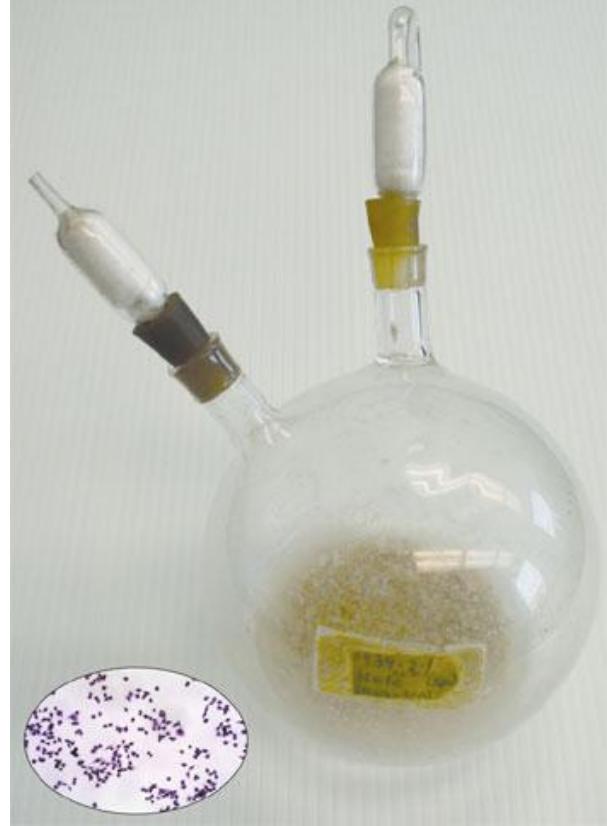
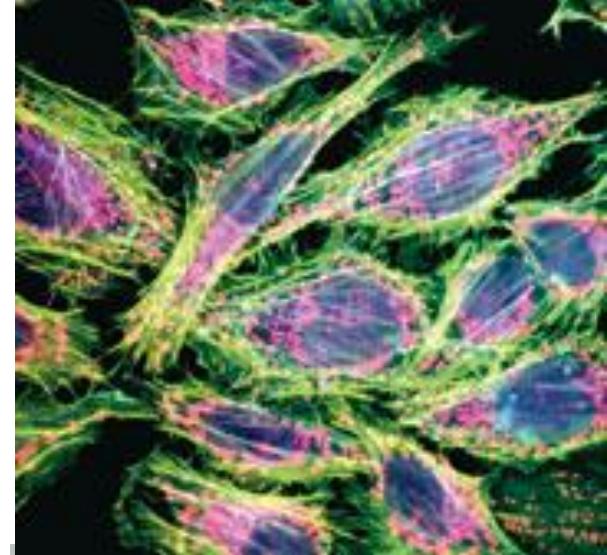






# HeLa cells

since 1951 self-replicating  
used in thousands biol exp  
contribution to medicine



## Henrietta Lacks

1920 - 1951

HeLa cancer cells have evolved into a self-replicating, single-cell life-form.

HeLa cells should be given the new species name of *Helacyton gartleri*.

The cells are a genetic chimera of HPV18 and human cervical cells and now have a distinct, stable, non-human chromosome number.

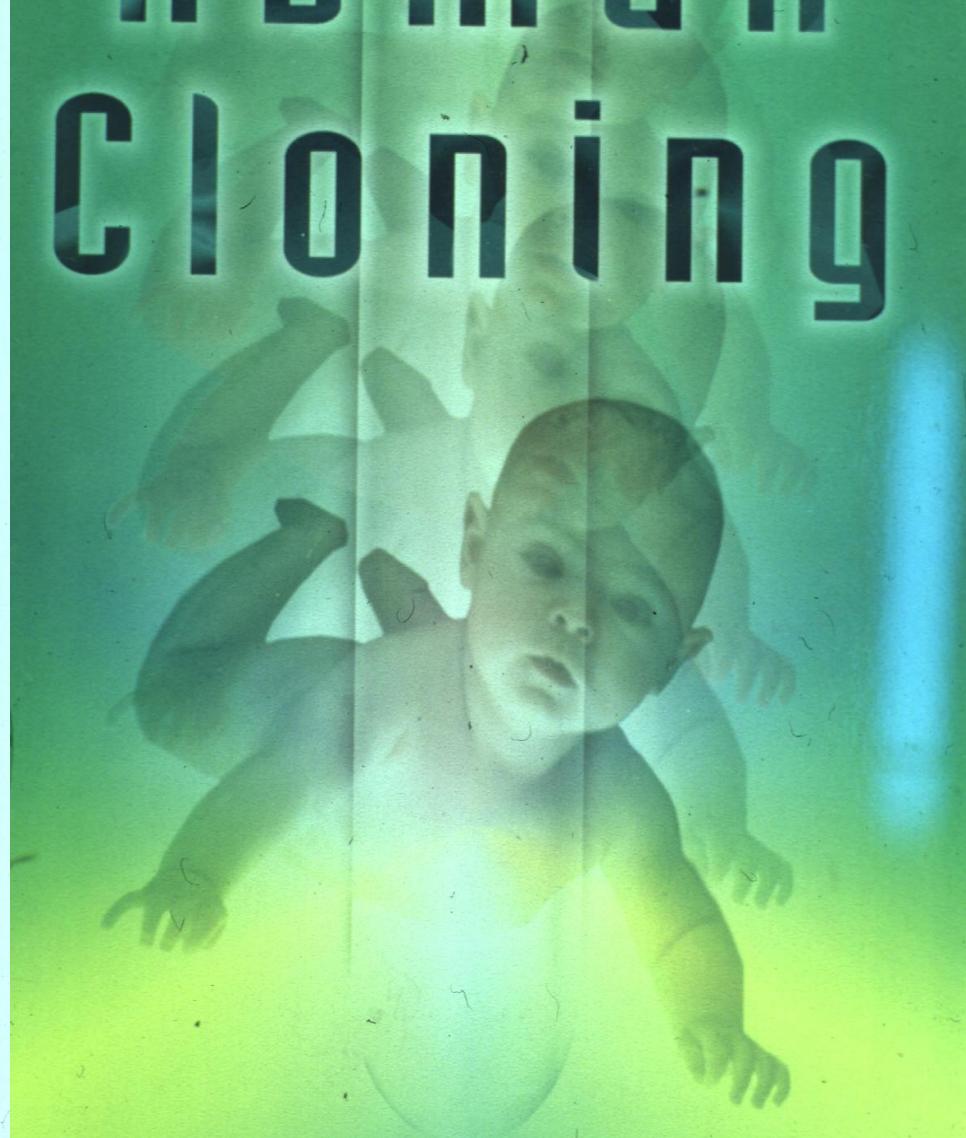


# WHO'S AFRAID OF HUMAN CLONING? ?

Gregory E. Pence

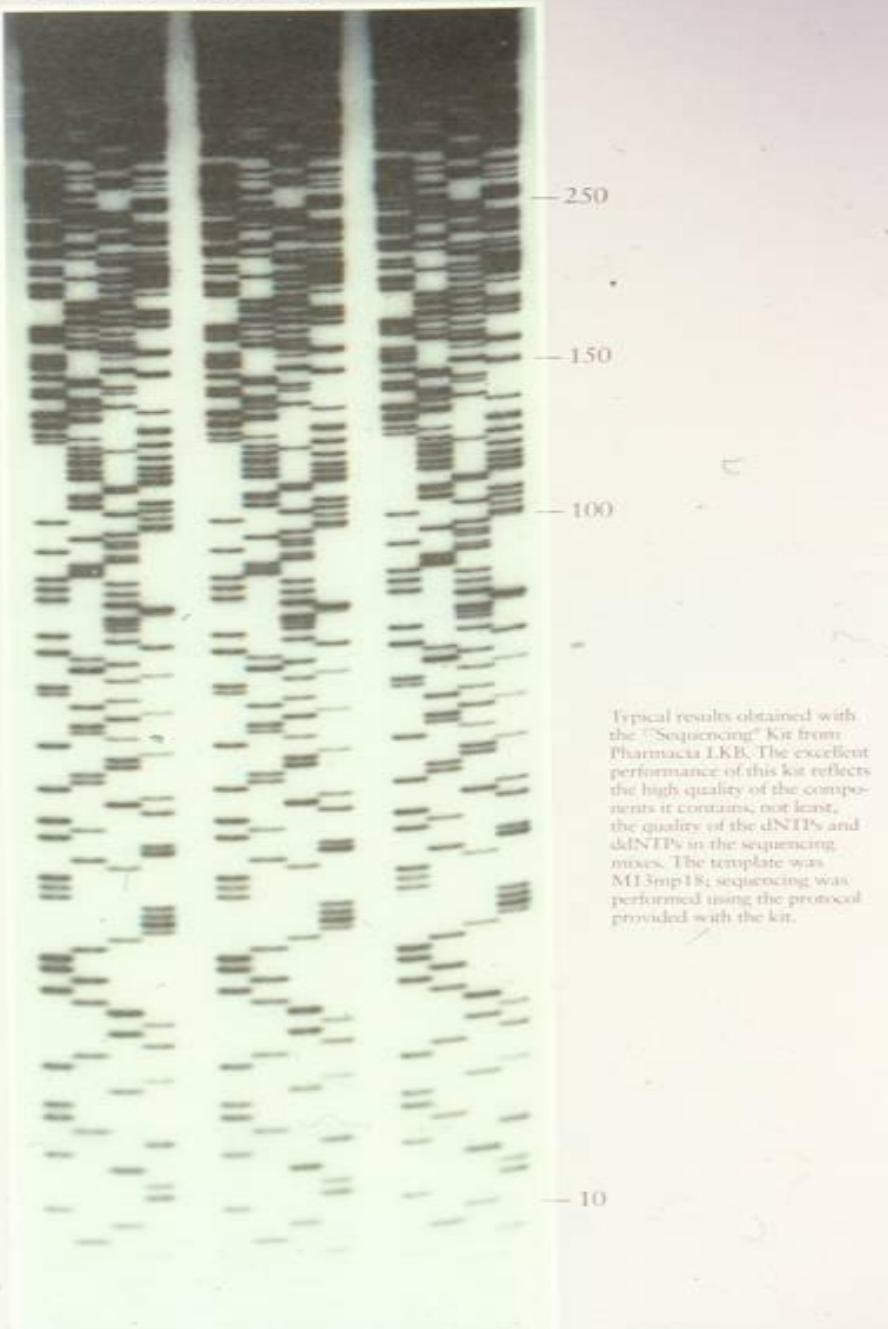
Playing God or Scientific Progress?

# H U m a n C l o n i n g

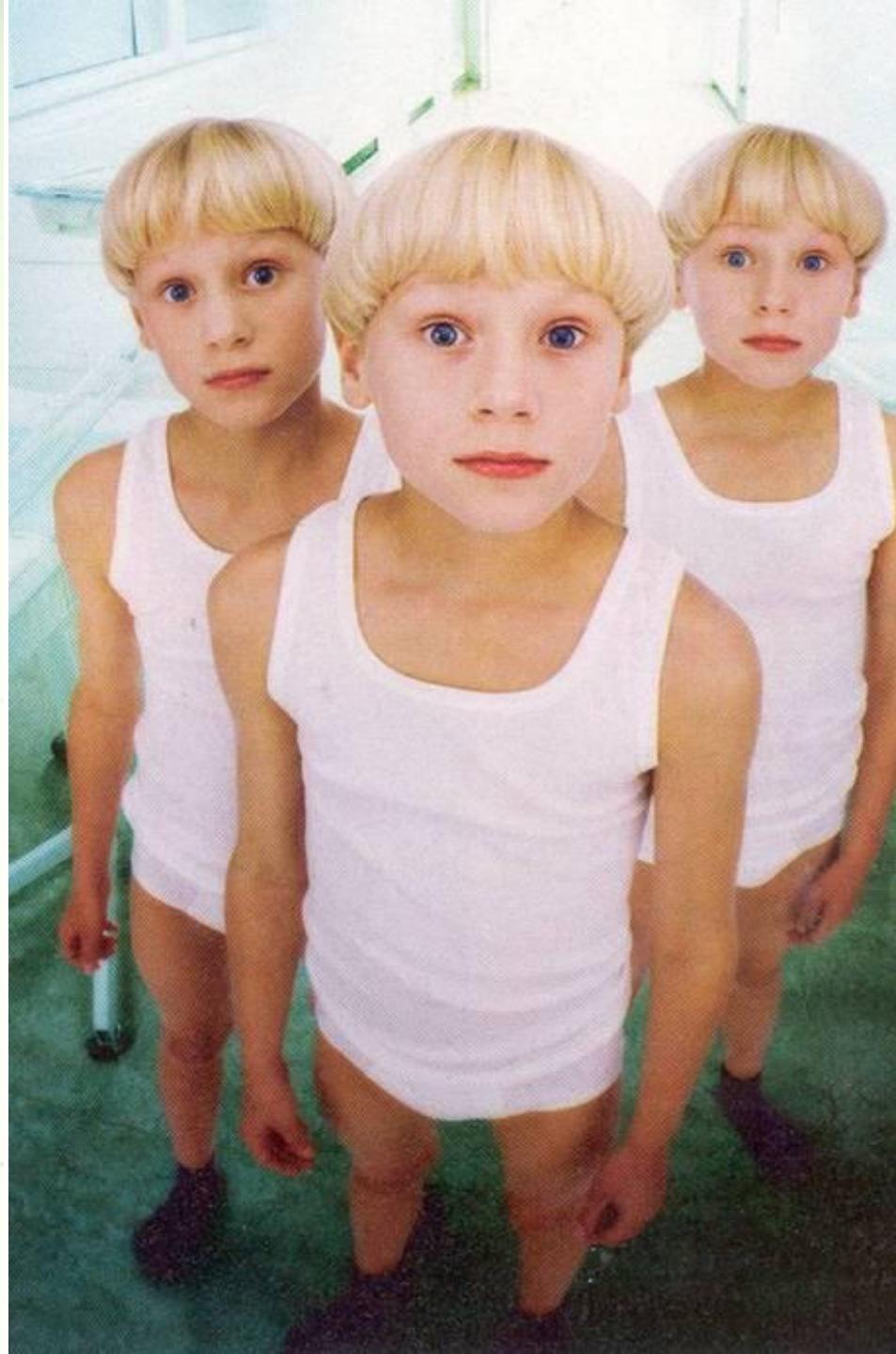


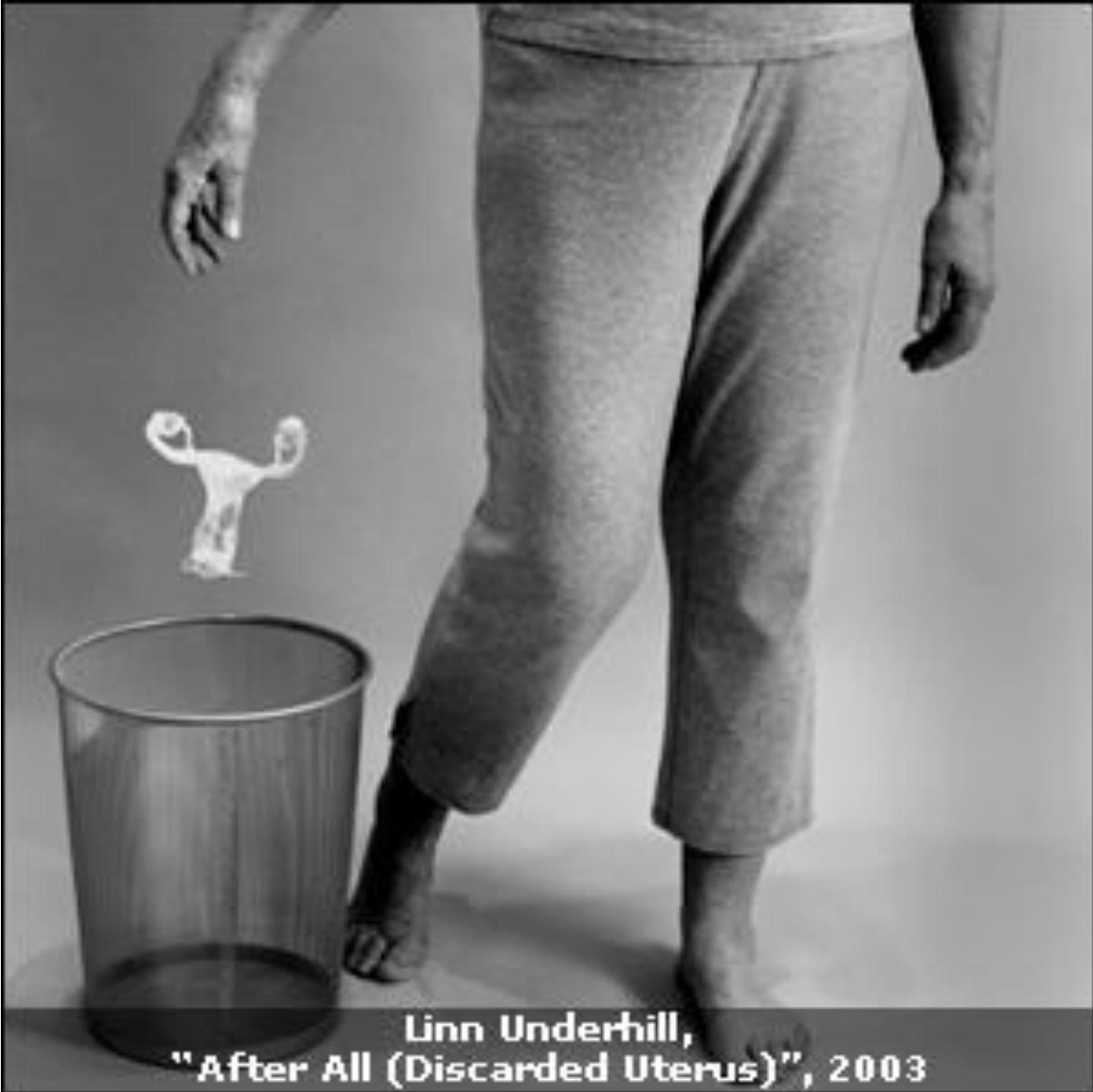
## Performance in DNA Sequencing

G A T C   G A T C   G A T C



Typical results obtained with the "Sequencing" Kit from Pharmacia LKB. The excellent performance of this kit reflects the high quality of the components it contains; not least, the quality of the dNTPs and ddNTPs in the sequencing mixes. The template was M13mp18; sequencing was performed using the protocol provided with the kit.





Linn Underhill,  
"After All (Discarded Uterus)", 2003

# Spectator Classified

## Rates

CLASSIFIED ADS:  
\$7.00 per first 20 words.  
25¢ per each additional word.  
All ads must be pre-paid.  
2 business day deadline.  
Call 854-9550 for information.

## beauty & health

I LOST 26 pounds in 6 weeks without dieting or exercise! Just 3 pills at breakfast and the weight fell off! Get YES now at <http://www.geocen.com>, 100% money back guarantee. NEED TO IMPROVE your complexion? See results in 30 minutes. New Oceanik Clay—100% natural, 100% guaranteed. <http://www.geocen.com>. Start today!

## apartments

WHY PAY RENT? You can live for just \$1261/mo w/only 10% down. This 825 sq ft 1 BR includes tin ceilings, 2 deco FPL, W/D. Only \$225K with super-low maint. Open house Sun, Oct 31, 12-1:30 pm, 17 W 100 St, #3E.

MARA & CO—123 St/B'way. 2 BRs for rent. Avail Nov 1. Students and shares welcome. Rent \$1310/mo. Call before Aug 9/25 774-2222 e-mail: [mj@marany.com](mailto:mj@marany.com)

## egg donor

**EGG DONOR NEEDED**  
Young parents, who successfully worked with a kind and generous donor to produce a wonderful baby boy, now 3 years old, seek to do it again. Our son longs for a sibling. We are hoping to find an intelligent Caucasian woman in her 20s of average height and weight who has warmth and a strong sense of commitment. Must be able to travel to Somerset, NJ. Compensation \$6500. For info call Marylyn at (800) 241-7589. Code SLFC. PLEASE GIVE THE GIFT OF LIFE!

## fitness

LET ONE-ON-ONE female personal trainer help you achieve your fitness goals, firming, toning, strength training. Specializing in weight-loss, injury rehab, pre- and post-natal workouts individually designed to meet your needs. In your home at your own pace. Call Catherine (212) 978-9519.

## for sale

1995 FORD TAURUS station wagon. Excellent condition. 43,000 miles. Power steering, antilock brakes. Must see. \$6800. 663-3598.

TABLES & CHAIRS for sale. Call Voula (212) 662-6330.

## help wanted

SLAM BASKETBALL Magazine is looking for an intern—18 hrs/wk, \$7/hr. Organizational and writing skill a must; basketball knowledge a plus. If interested, send a resume and writing samples to Tyler Moore via fax: (212) 620-7787 or mail: Slam Magazine, 1115 Broadway, BH 1, New York, NY 10010.

110th St dogwalker needs daily afternoon assistance. \$10/hr. 665-4320.

BARON (who is 18 months) needs a fun, creative babysitter. Afternoons, hours flexible. \$10/hr. Call Roz or Gary (212) 749-6429.

LIVE-IN TUTOR to assist male A+ High School senior with homework and AP psych, physics & history. Evenings. Salary \$175/wk plus private accommodations. Close to 6 train. Call days (212) 966-0021, x16; evens (212) 737-7046.

GRADUATE STUDENTS Work with leading companies on lucrative short-term projects you can perform from home. Use skills you already have. Research, quantitative analysis, spreadsheet development and more. Work as little or as much as you like according

## psychotherapy

Are you in a relationship but unhappy? Support group led by licensed, experienced psychotherapist to help you decide whether to stay or leave your relationship. Also, individual counseling in a safe, supportive environment to work on personal relationship and career issues. Call (212) 307-0434 for more information.

THERAPIST, NYS Certified, specializing in stress-related problems concerning career goals, school, family, interpersonal relationships, etc. Individual or couple counseling available. Marty Babis, CSW. (212) 665-5995, leave message.

## research

RESEARCH SUBJECTS needed. Earn \$30-\$40 in a language study at City College (138 St). Call 650-5680 for info.

HEALTH CONTROLS needed for Brain Imaging Study at Columbia Presbyterian. Earn up to \$330. Must be medication and drug free. Call 568-6850.

OVERWEIGHT MALE participants (18-45) needed. Breakfast study at St Luke's Hospital (114th St & Amsterdam). Get free physical and payment of \$300. (212) 523-1845.

## sublet wanted

FEMALE looking for sublet for internship in NYC. Upper West Side, Dec 15-Jan 16. Contact (305) 284-6019.

## travel

PARIS SUBLET. Studio apt on Isle St Louis (near Notre Dame Church). Quiet charm. Gentleman 663-0131.

CANCUN 2000 from \$399. 14 free meals, 23 hours of free drinks, \$30 early bird discount. \$100 off trip in 2001! Call free 1 (800) 244-4463.

## SPECIAL EGG DONOR NEEDED

**\$25,000**

We are a loving, infertile couple hoping to find a compassionate woman to help us have a baby. We're looking for a healthy, intelligent college student or college graduate, age 21-33, with blue eyes and blonde or light brown hair. Compensation \$25,000 plus expenses. Your gift of life would bring great joy!



Please contact us through our representative at 1 (800) 776-7680.

**e-mail**  
**Columbia Spectator**

News/Editorial email: [spectator@columbia.edu](mailto:spectator@columbia.edu)  
Advertising email: [specads@columbia.edu](mailto:specads@columbia.edu)

## Psychic Readings by Donna

She has a gifted power to help you. If you feel troubled, worried or in doubt, one visit will put your mind at ease. Specializing in returning loved ones; tells you about past, present and future, love, marriage and business, without asking a single question.

**(212) 681-6159**

## Council Travel

**4 Days Only  
Sale Extravaganza**

**LONDON \$85****MILAN \$145****SHANNON \$105**

Ask about South American Sale Fares!  
Take my hand as I partake, come apply, stand alone for the like Rock (one minute appt), no reservation, subject to availability, under such only. FACULTY required, up revision for appt.

Need to supplement your income?  
Temp with **Quantum**.  
We have great positions from:  
**Clerical to**  
**Medical**

**Mt. Sinai's, Dept.  
of Dermatology**



ReLLI

Jürgen Habermas

# Il futuro della natura umana

I rischi di una genetica liberale

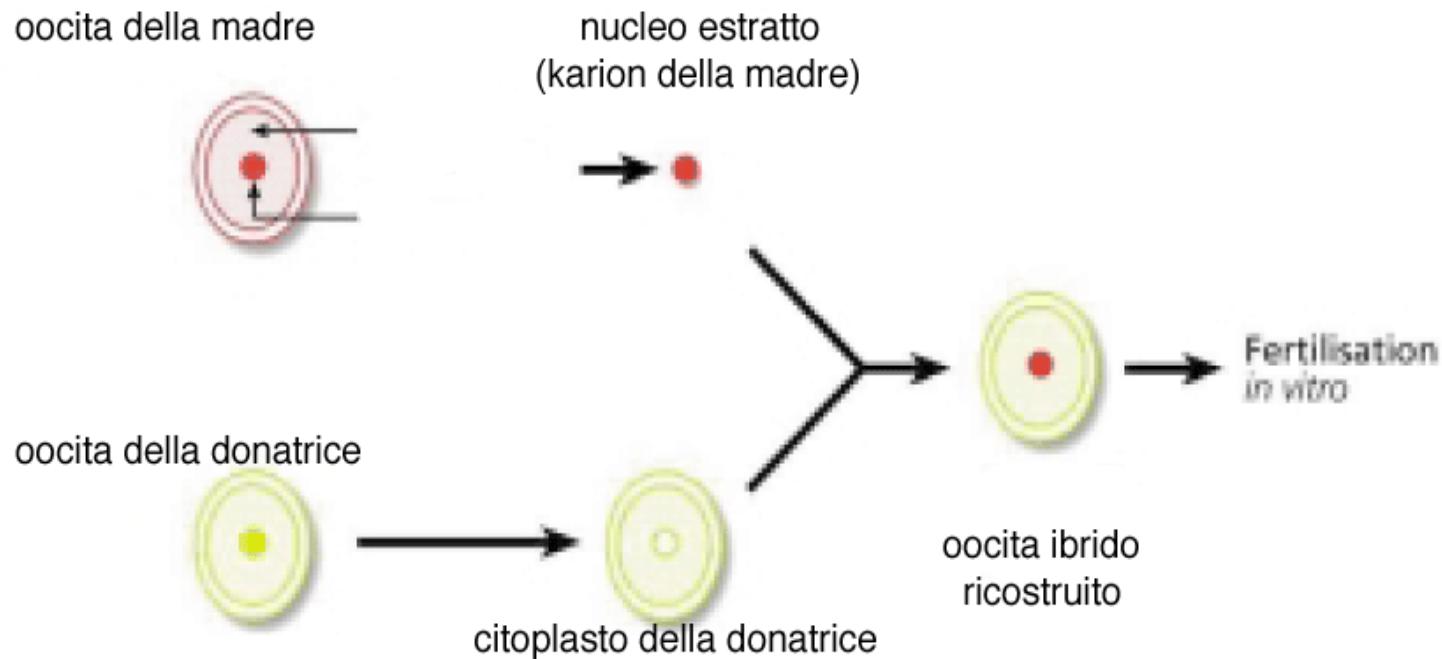
A cura di Leonardo Ceppa

# Frontiera insuperabile !?!?!?!

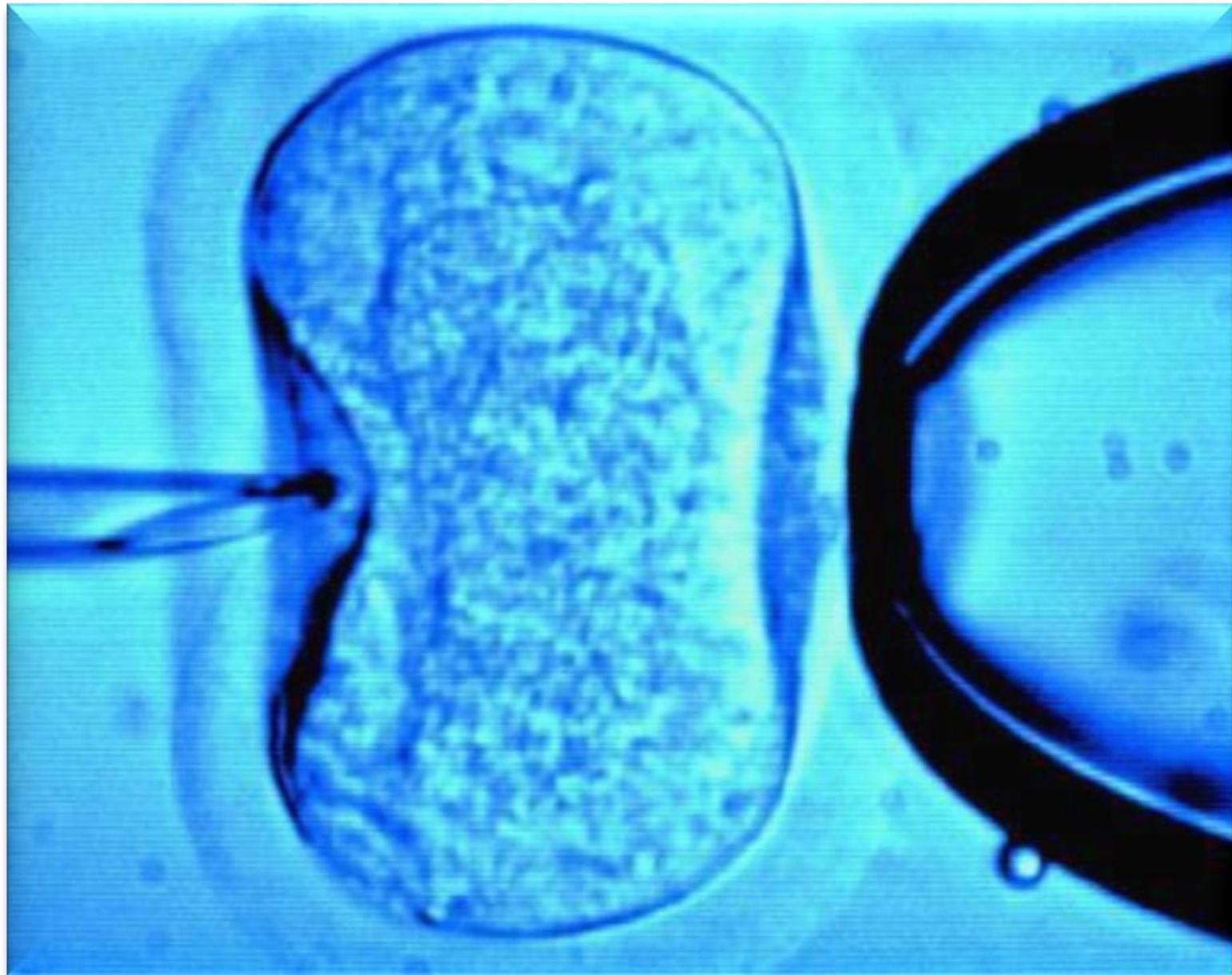


BIBLIOTECA EINAUDI

## Treating mitochondrial disease by oocyte (egg) nucleus transfer – key steps



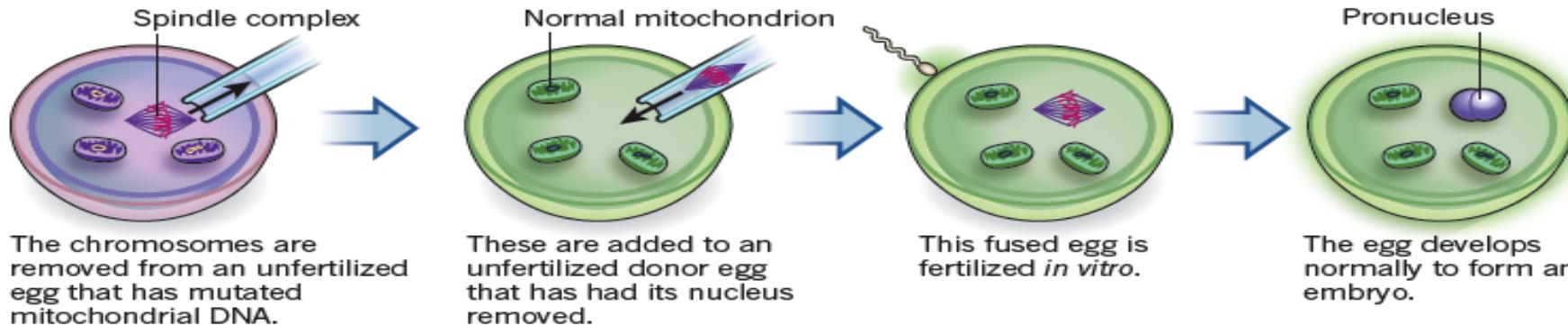
# In vitro fertilization



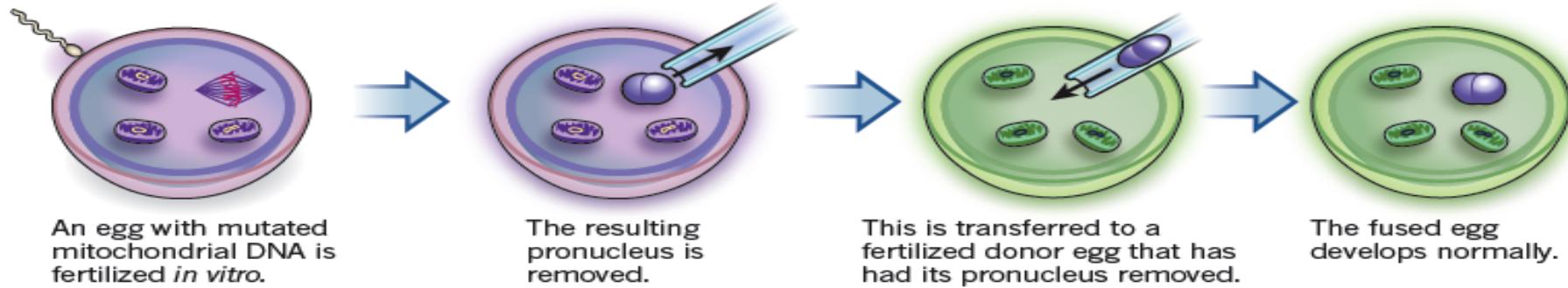
## TWO WAYS TO CRACK AN EGG

Researchers are studying two ways to fuse a diseased egg with a healthy one to prevent rare mitochondrial diseases.

### Maternal spindle transfer



### Pronuclear transfer



### EMBRYOLOGY

# UK sets sights on gene therapy in eggs

*Public consultation and safety assessment would pave the way for embryo manipulation to treat genetic diseases.*

# L'OSSErvATORE ROMANO

GIORNALE QUOTIDIANO

POLITICO RELIGIOSO

*Unicuique suum*

*Non praevalebunt*

Anno CLIII n. 113 (46.357)

Città del Vaticano

sabato 18 maggio 2013

Il vescovo di Roma incoraggia le Pontificie opere missionarie a sostenere le comunità in difficoltà

## Sino agli estremi confini della terra

Sostegno alle «giovani Chiese, che non di rado operano in un clima di difficoltà, di discriminazione, anche di persecuzione» è stato chiesto dal Papa ai partecipanti all'assemblea generale delle Pontificie Opere Missionarie, ricevuti in udienza stamane, venerdì 17.

In particolare il Santo Padre ha sottolineato che le Opere Missionarie aiutano «a tenere sempre viva l'attività di evangelizzazione» che, ha ricordato, è «paradigma di ogni opera della Chiesa». Non a caso «il vescovo di Roma è chiamato ad essere Pastore non solo della sua Chiesa particolare, ma anche di tutte le Chiese, affinché il Vangelo sia annunciato sino agli estremi confini della terra».

Una missione estremamente attuale, ha sottolineato il Pontefice, perché ci sono tanti popoli che non hanno ancora conosciuto e incontrato Cristo. In questo senso «le Pontificie Opere Missionarie sono uno strumento privilegiato nelle mani del Papa». Soprattutto se mirate alla promozione e alla formazione di uno spirito missionario universale e ad una sempre maggiore comunione e collaborazione tra le diverse comunità, spesso tentate «di chiudersi in se



di AUGUSTO PESSINA\*

**L**a tecnica di clonazione basata sul *nuclear transfer* («trasferimento del nucleo») – introdotta e applicata per la prima volta sugli anfibi da John Gurdon (premio Nobel per la medicina 2012) e successivamente utilizzata da Jan Wilmut per clonare la pecora Dolly – è ora possibile anche sull'uomo. La notizia, pubblicata dalla rivista «Cell», ha avuto sui media grande risalto.

Dopo la clonazione di Dolly nel 1997 molti laboratori hanno fatto a gara per verificare la possibilità di creare cloni umani, alcuni di essi hanno anche dichiarato di esserci riusciti. Ma finora non risulta che sia nato un uomo clonato. Diverse sono state infatti le relazioni scientifiche che hanno evidenziato la difficoltà di applicare questa tecnica alla specie umana, perché sembrava molto arduo far crescere questo zigote artificiale (creato inserendo il nucleo di una cellula adulta). Anche le campagne per favorire la donazione di ovociti introdotta per

La tecnica per creare in vitro embrioni umani

## Una scienza che non si pone scrupoli

possibilità pratica della clonazione riproduttiva.

In realtà l'attenzione dei media è stata subito rivolta alla cosiddetta clonazione terapeutica che potrebbe dare ai malati speranze di guarigione. Da un punto di vista etico sono in molti a ritenere una mostruosità la creazione in vitro di un embrione (clone del donatore del nucleo somatico) per farlo nascere (clonazione riproduttiva). Tuttavia agli stessi non sembra essere grave creare in vitro un embrione umano da utilizzare per farne cellule.

Il problema serio è che non basta coniugare la magica parola «terapeutica» al termine clonazione per fare diventare etica la soppressione di una vita umana creata solo allo scopo di farne cellule da usare in terapie (la cui efficacia è peraltro ancora da dimostrare).

Riferendoci poi alla sperimentazione riportata da «Cell» va anche sottolineato che per ottenere i gameti femminili la procedura ha avuto necessariamente bisogno di trattare donne disponibili a queste ricerche come donatrici di ovociti.