A surgeon in a blue surgical mask and scrubs is looking at a tablet in his hands. He is in a futuristic medical control room with various data displays, including a brain scan, a heart rate monitor, and a vertical scale with numbers 50, 60, 70, 80, and 90. The background is dark with blue and green light effects.

Qué grandes eventos están
moldeando el futuro de la
medicina de precisión

IMPRECISION MEDICINE

For every person they do help (blue), the ten highest-grossing drugs in the United States fail to improve the conditions of between 3 and 24 people (red).

1. ABILIFY (aripiprazole)
Schizophrenia



2. NEXIUM (esomeprazole)
Heartburn



3. HUMIRA (adalimumab)
Arthritis



4. CRESTOR (rosuvastatin)
High cholesterol



5. CYMBALTA (duloxetine)
Depression



6. ADVAIR DISKUS (fluticasone propionate)
Asthma



7. ENBREL (etanercept)
Psoriasis



8. REMICADE (infliximab)
Crohn's disease



9. COPAXONE (glatiramer acetate)
Multiple sclerosis



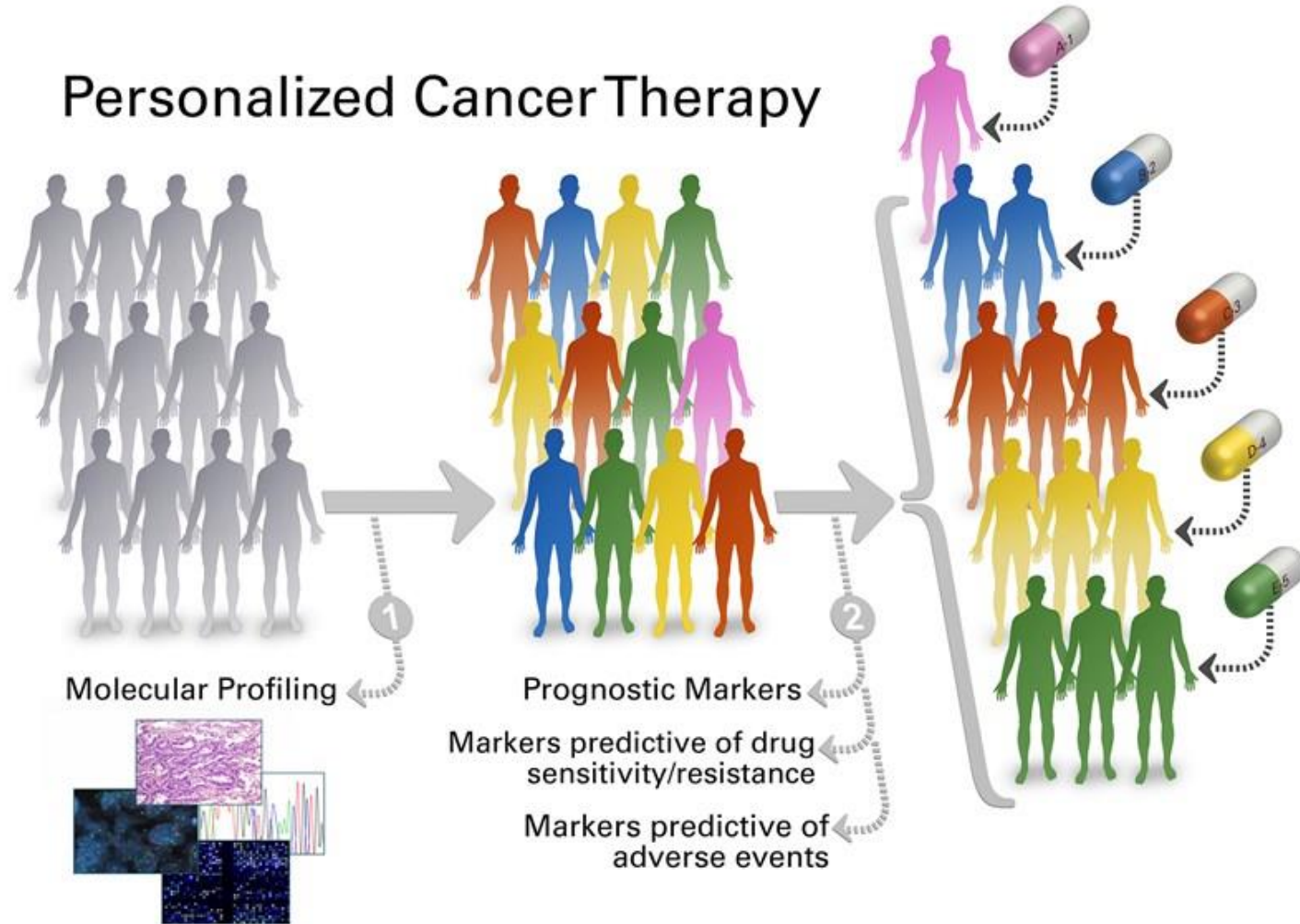
10. NEULASTA (pegfilgrastim)
Neutropenia



Based on published number needed to treat (NNT) figures. For a full list of references, see Supplementary Information at go.nature.com/4dr78f.

Precision Medicine

Personalized Cancer Therapy





Next Generation Sequencing

DNA sequencing
is the technology that experienced
the ***most dramatic advances***
in the human history

the last ten years

2008

2018

50,000 b

day
1 equipment

18,000,000,000,000 b

day
1 equipment

0.000016

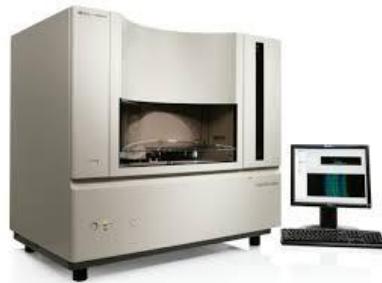
human genomes
day

100,000,000 USD

600

human genomes
day

1,000 USD



illumina®

Projected annual storage in 2025

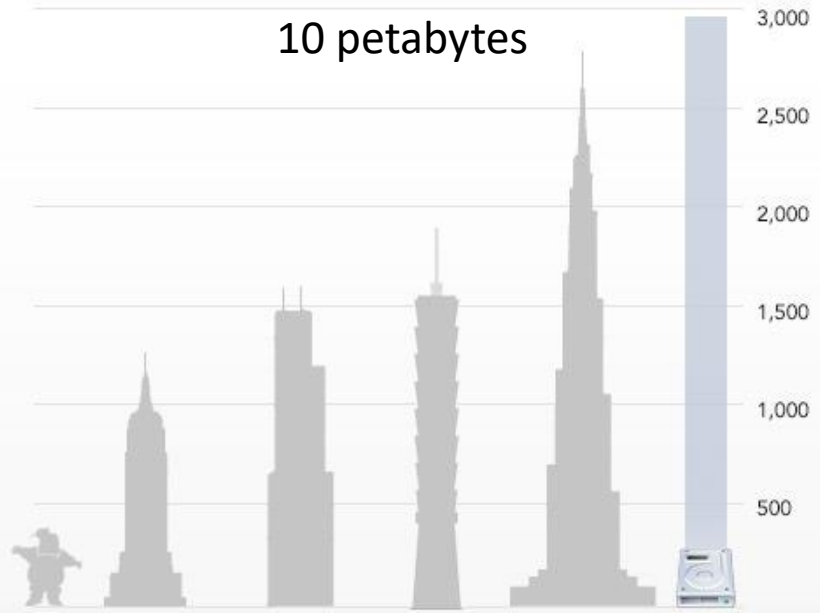
Twitter: 1–17 petabytes per year

Astronomy:
1,000 PB/year

YouTube:
1,000–2,000 PB/year

Genomics:
2,000-40,000
PB/year

BACKBLAZE DRIVES STACKED



Structure	Height (feet)
Empire State Building	1,250
Willis (Sears) Tower	1,451
Taipei 101	1,671
Burj Khalifa	2,717
Drives	2,968

* 6,195 drives x 5.75 inches of drive height = 35,621 inches or 2,968 feet

*Biological interpretation
(social, legal issues)
Lagging Behind*



*Technology
at the forefront*





Harvard
Business
Review

El valor de los datos



DATA

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

FROM THE OCTOBER 2012 ISSUE

So you wanna be a data scientist? A guide to 2015's hottest profession

Science

- 1.Math
- 2.Machine learning

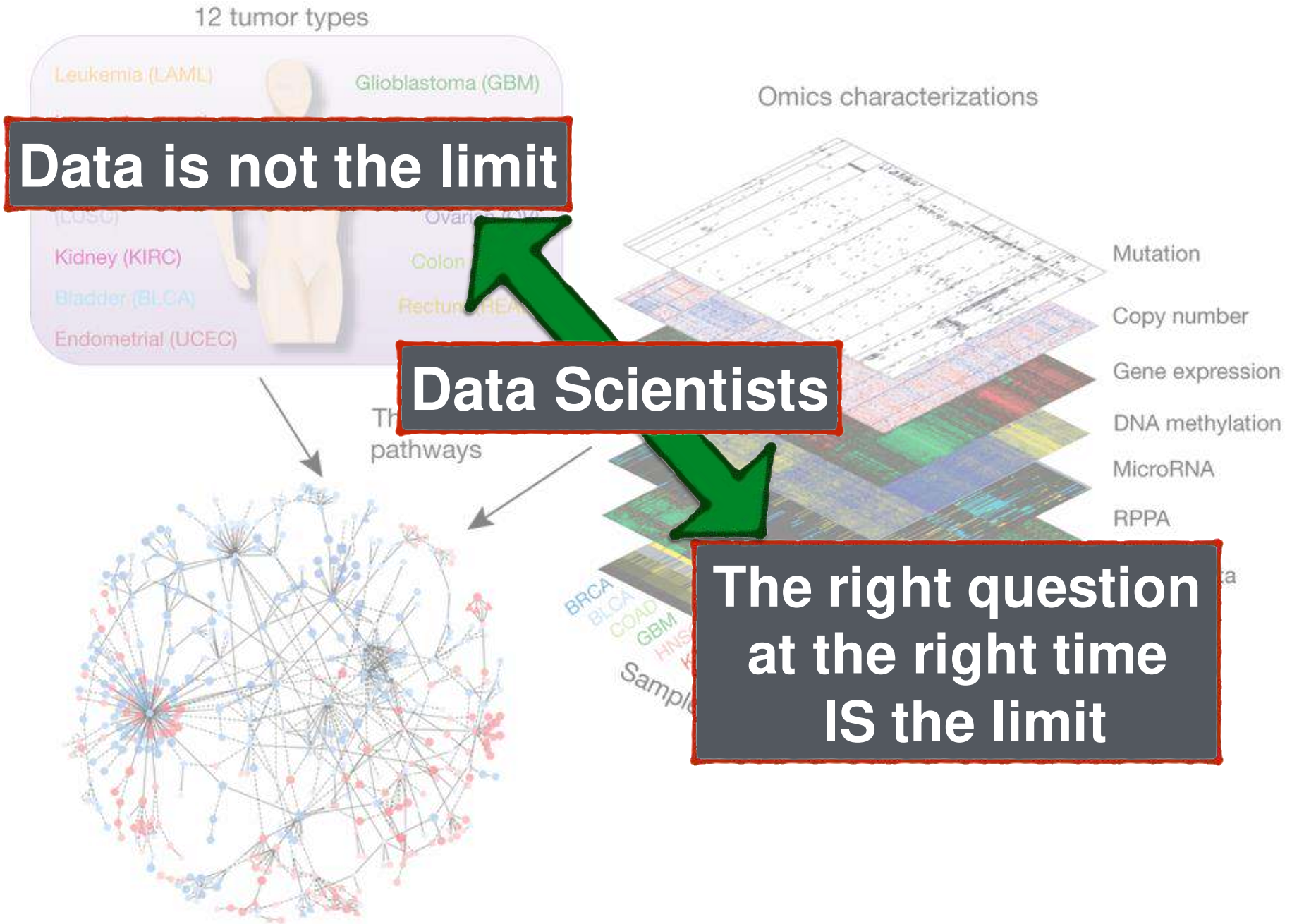
Data

- 1.Statistics
- 2.R programming

Art

- 1.Visualisation
- 2.Creativity
(find signal in noise)

Big Data in genomics



Research

Clinical Diagnostics/Therapies



La traducción al paciente

CAREERS

TRANSIOS From building houses to building molecules p.53

FUTUREPLANS Three steps to prepare for the next five years genature.com/pt/13

NATUREJOBS For the latest career listings and advice www.naturejobs.com



GENETICS

Fluent in DNA

As genomics migrates to the clinic, job options are emerging for genetic counsellors to explain the meaning in mutations.

Genetic Counsellor
Is the next big thing
in hot professions

04

Inteligencia Artificial (Aumentada)

DEEP MEDICINE

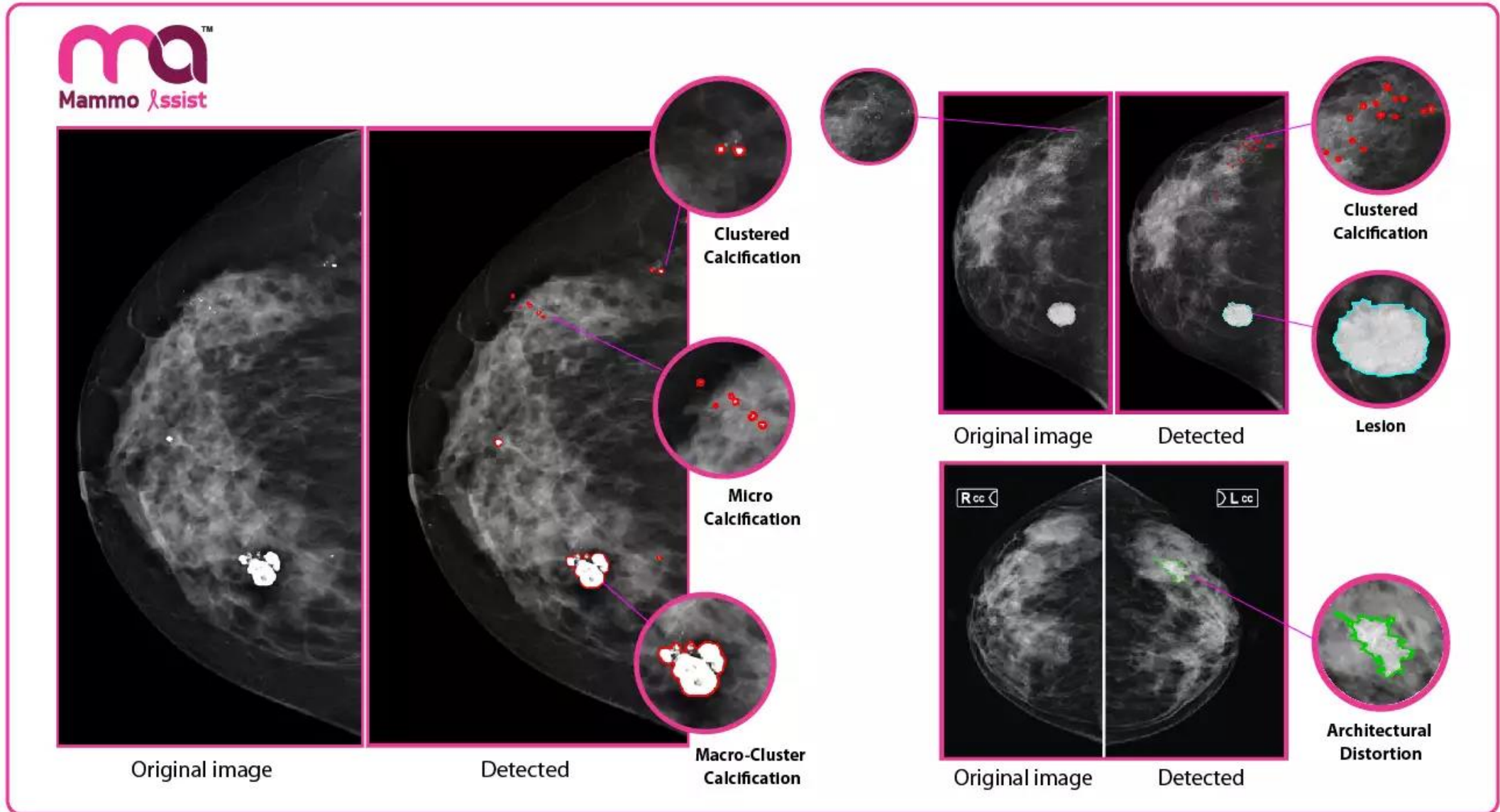
HOW ARTIFICIAL
INTELLIGENCE
CAN MAKE
HEALTHCARE
HUMAN AGAIN

ERIC TOPOL

With a foreword by
ABRAHAM VERGHESE,
author of *Cutting for Stone*



AI: Deep learning in image classification in Early Breast Cancer



Fibrilación Atrial Familiar

info@heritas.com.ar

Cibic es distribuidor comercial exclusivo de los productos de Héritas. Contactanos a servicios@heritas.com.ar.



Plat. Tecnológicas

Asesoría genética

Servicios

Novedades

Acerca de Heritas

Contacto



SÍNDROME DE QT LARGO

SÍNDROME DE BRUGADA

SÍNDROME DE QT CORTO

TAQUICARDIA VENTRICULAR

CATECOLAMINÉRGICA POLIMÓRFICA

FIBRILACIÓN ATRIAL FAMILIAR

La fibrilación atrial (FA) familiar es una manifestación asociada a diversos fenotipos electrofisiológicos y/o inclusive cardiopatías estructurales, en los que el desarrollo de FA puede presentarse en forma primaria.

GENES COMPROBADOS

GJA5	KCNQ1	SCN5A	
------	-------	-------	--

GENES EMERGENTES

ABCC9	DSC2	EMD	HCN4
JPH2	KCNA5	KCND3	KCNE1
KCNE2	KCNE3	KCNJ2	KCNJ8
LMNA	MYH6	NKX2-5	NPPA
SCN3B	SCN4B		

AFib – AI machine learning



Apple Watch.
Helping your patients
identify early warning
signs.



Dispositivos móviles

The Lancet

Wearable technology and lifestyle management: the fight against obesity and diabetes

In January, The Lancet published two Commissions investigating the link between food, health and the current lack of conclusive clinical evidence showing the efficacy of this technology for promoting behaviour



VIEWPOINT JAMA

Personal Health Records More Promising in the Smartphone Era?

Christian Dameff, MD

As health care delivery organizations shift from implementation of electronic health records to optimization reported in

NEJM
The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

FRONTIERS IN MEDICINE

Mobile Devices and Health

Ida Sim, M.D., Ph.D.

MOBILE HEALTH — THE APPLICATION OF SENSORS, MOBILE APPS

JAMA

VIEWPOINT

Wearable Devices for Cardiac Rhythm Diagnosis and Management

James E. Ip, MD
Division of Cardiology, Department of Medicine, Cornell

With the increasing use of direct-to-consumer medical devices, it is paramount for clinicians to recognize the potential utilization for patient management. The

Combining data from PPG sensors with accelerometers can help identify some arrhythmic cardiac detection at rest may indicate

www.nature.com/npjdigitalmeo



RESEARCH ARTICLE JAMA

Digital Health: Tracking Physiomes and Activity Using Wearable Biosensors Reveals Useful Health-Related Information

Xiao Li¹, Jessilyn Dunn^{1,2}, Denis Salins¹, Gao Zhou¹, Wenyu Zhou¹, Sophia Miryam Schüssler-Florenza Rose^{3,4}, Dalia Perelman⁵, Elizabeth Colbert³, Ryan Runge¹, Shannon Rego³, Ria Somecha¹, Somalee Datta¹, Tracey McLaughlin⁵, Michael P. Snyder¹

npj Digital Medicine

NATURE

PERSPECTIVE OPEN

Best practices for analyzing large-scale health data from wearables and smartphone apps

Jennifer L. Hicks¹, Tim Althoff², Rok Sosic³, Peter Kuhar⁴, Bojan Bostjancic⁴, Abby C. King^{5,6}, Jure Leskovec^{3,7} and Scott L. Delp^{1,8}

Smartphone apps and wearable devices for tracking physical activity and other health behaviors have become popular in recent years and provide a largely untapped source of data about health behaviors in the free-living environment. The data are large in

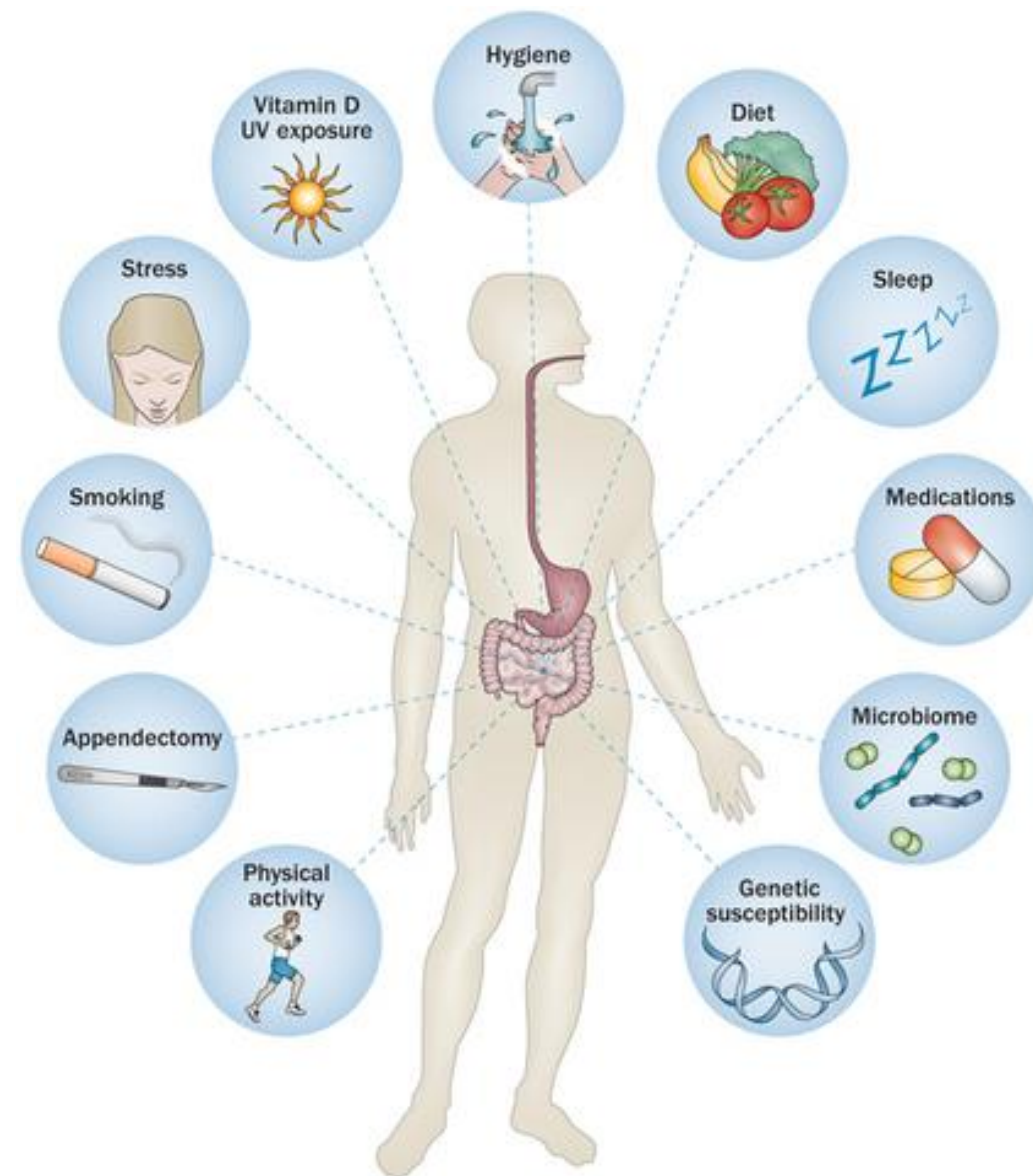
06

10%
Human



Environment dominates over host genetics in shaping human gut microbiota

Daphna Rothschild^{1,2*}, Omer Weissbrod^{1,2*}, Elad Barkan^{1,2*}, Alexander Kurilshikov³, Tal Korem^{1,2}, David Zeevi^{1,2}, Paul I. Costea^{1,2}, Anastasia Godneva^{1,2}, Iris N. Kalka^{1,2}, Noam Bar^{1,2}, Smadar Shilo^{1,2}, Dar Lador^{1,2}, Arnau Vich Vila^{1,4}, Niv Zmora^{5,6,7}, Meirav Pevsner-Fischer⁵, David Israeli⁸, Noa Kosower^{1,2}, Gal Malka^{1,2}, Bat Chen Wolf^{1,2}, Tali Avnit-Sagi^{1,2}, Maya Lotan-Pompan^{1,2}, Adina Weinberger^{1,2}, Zamir Halpern^{7,9}, Shaf Carmi¹⁰, Jingyuan Fu^{3,11}, Cisca Wijmenga^{3,12}, Alexandra Zhernakova³, Eran Elinav^{5,8} & Eran Segal^{1,2,8}



Microbioma Humano y salud



- ☑ Obesidad
- ☑ Intolerancia Alimentos
- ☑ Diabetes
- ☑ Autoinmunidad
- ☑ Cancer colon
- ☑ Homeostasis riñon
- ☑ Enfermedad periodontal
- ☑ Esofagitis
- ☑ Gastritis
- ☑ Gastroenteritis
- ☑ Colon Irritable
- ☑ Enfermedad de Crohn
- ☑ Artritis Reumatoidea
- ☑ Parkinson
- ☑ Enfermedades psiquiatricas
- ☑ Autismo
- ☑ Schizofrenia
- ☑ Infertilidad



Next Generation Sequencing

El valor de los datos

La traducción al paciente

Inteligencia Artificial

Dispositivos móviles

Microbioma Humano