Magari fosse frode !
(..storia della colonna infame)

Alessandro Giuliani

Il pregiudizio più comune è pensare di non avere pregiudizi.

La scienza inganna in tre modi: trasformando le sue proposizioni in norme, divulgando i suoi risultati più che i suoi metodi, tacendo le sue limitazioni epistemologiche

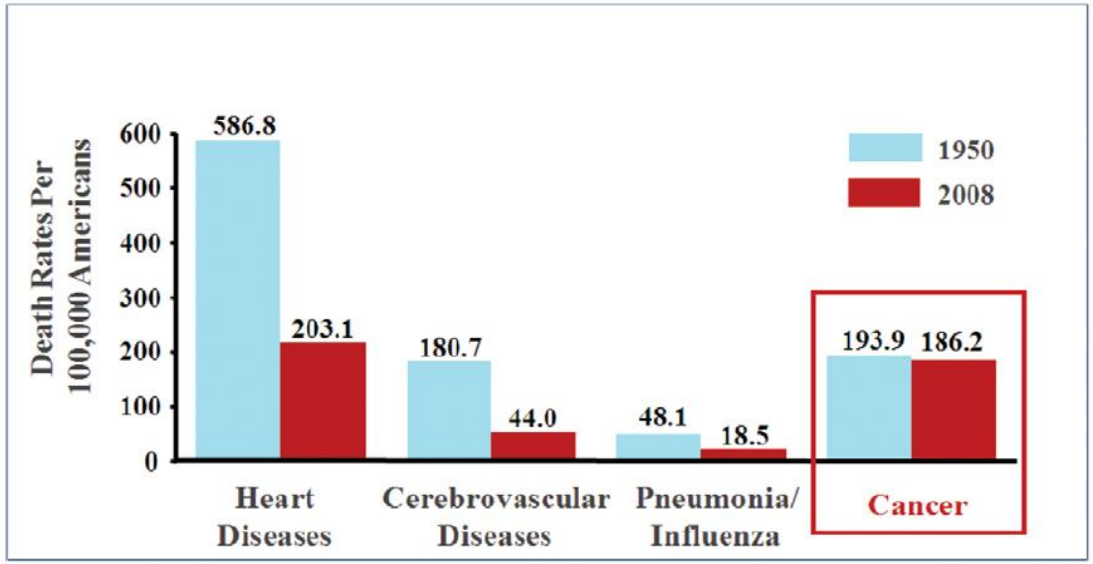
Nicolas Gomez Davila (In margine a un testo implicito)

ELSEVIER

EDITORIAL

Fear of Failure: Why American Science Is Not Winning the War on Cancer

Behind many stereotypes there is a truth. The stereotypical FEAR OF



Mortality rates (years 1950-2008) for infectious, heart, cerebrovascular diseases (From American Cancer Society (ACS) 2010 Cancer Facts & Figures; Atlanta, USA, 2008).

Open access, freely available online

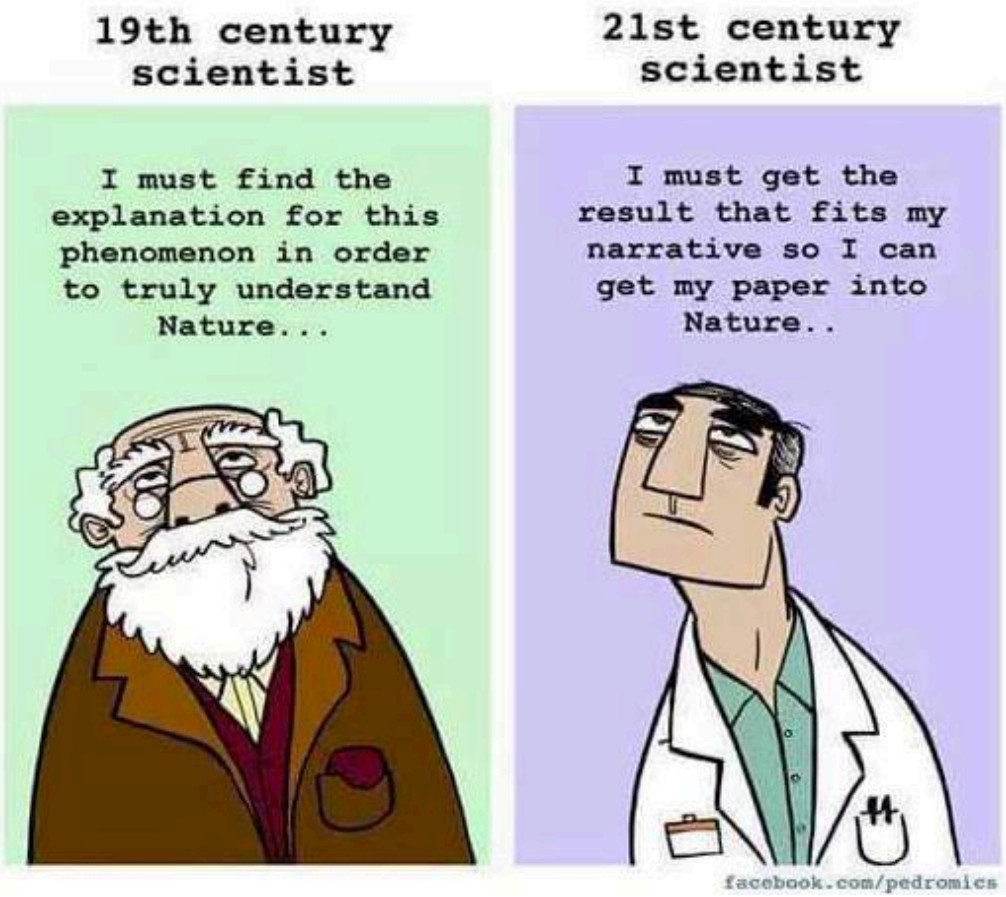
Essay

Why Most Published Research Findings Are False

John P. A. Ioannidis

Table 4. PPV of Research Findings for Various Combinations of Power (1 − β), Ratio of True to Not-True Relationships *(R)*, and Bias *(u)*

1 − β	*R*	*u*	Practical Example	PPV
0.80	1:1	0.10	Adequately powered RCT with little bias and 1:1 pre-study odds	0.85
0.95	2:1	0.30	Confirmatory meta-analysis of good-quality RCTs	0.85
0.80	1:3	0.40	Meta-analysis of small inconclusive studies	0.41
0.20	1:5	0.20	Underpowered, but well-performed phase I/II RCT	0.23
0.20	1:5	0.80	Underpowered, poorly performed phase I/II RCT	0.17
0.80	1:10	0.30	Adequately powered exploratory epidemiological study	0.20
0.20	1:10	0.30	Underpowered exploratory epidemiological study	0.12
0.20	1:1,000	0.80	Discovery-oriented exploratory research with massive testing	0.0010
0.20	1:1,000	0.20	As in previous example, but with more limited bias (more standardized)	0.0015


19th century scientist
I must find the explanation for this phenomenon in order to truly understand Nature...
21st century scientist
I must get the result that fits my narrative so I can get my paper into Nature..
facebook.com/pedromics

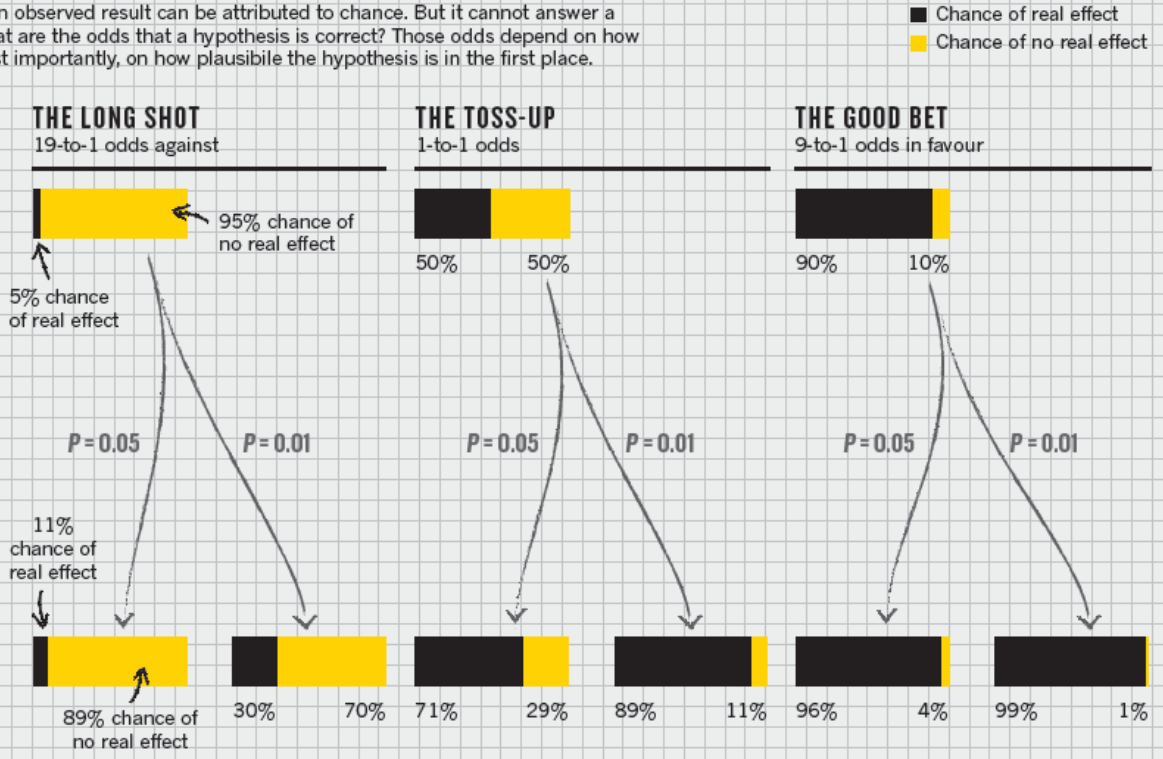
STATISTICAL ERRORS

P values, the 'gold standard' of statistical validity, are not as reliable as many scientists assume.

BY REGINA NUZZO

PROBABLE CAUSE

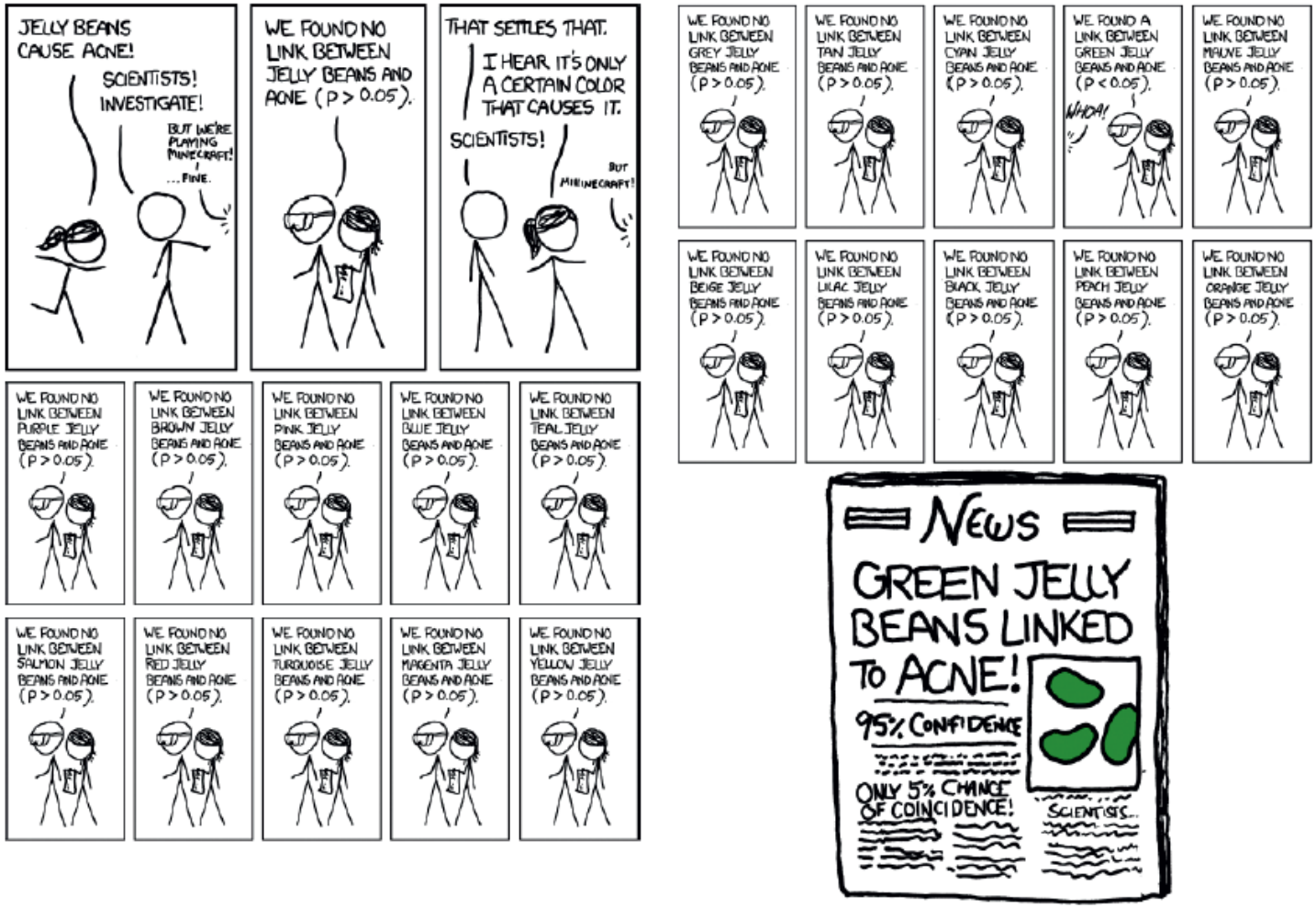
A *P* value measures whether an observed result can be attributed to chance. But it cannot answer a researcher's real question: what are the odds that a hypothesis is correct? Those odds depend on how strong the result was and, most importantly, on how plausibile the hypothesis is in the first place.



Deming, data and observational studies

A process out of control and needing fixing

"Any claim coming from an observational study is most likely to be wrong." Startling, but true. Coffee causes pancreatic cancer. Type A personality causes heart attacks. Trans-fat is a killer. Women who eat breakfast cereal give birth to more boys. All these claims come from observational studies; yet when the studies are carefully examined, the claimed links appear to be incorrect. What is going wrong? Some have suggested that the scientific method is failing, that nature itself is playing tricks on us. But it is our way of studying nature that is broken and that urgently needs mending, say **S. Stanley Young** and **Alan Karr**; and they propose a strategy to fix it.


JELLY BEANS CAUSE ACNE!
SCIENTISTS! INVESTIGATE!
BUT WE'RE PLAYING MINECRAFT!
...FINE.
WE FOUND NO LINK BETWEEN JELLY BEANS AND ACNE (P > 0.05).
THAT SETTLES THAT.
I HEAR IT'S ONLY A CERTAIN COLOR THAT CAUSES IT.
SCIENTISTS!
BUT MINECRAFT!
WE FOUND NO LINK BETWEEN PURPLE JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN BROWN JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN PINK JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN BLUE JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN TEAL JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN SALMON JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN RED JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN TURQUOISE JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN MAGENTA JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN YELLOW JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN GREY JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN TAN JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN CYAN JELLY BEANS AND ACNE (P > 0.05).
WE FOUND A LINK BETWEEN GREEN JELLY BEANS AND ACNE (P < 0.05).
WHOA!
WE FOUND NO LINK BETWEEN MAUVE JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN BEIGE JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN LILAC JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN BLACK JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN PEACH JELLY BEANS AND ACNE (P > 0.05).
WE FOUND NO LINK BETWEEN ORANGE JELLY BEANS AND ACNE (P > 0.05).
NEWS
GREEN JELLY BEANS LINKED TO ACNE!
95% CONFIDENCE
ONLY 5% CHANCE OF COINCIDENCE!
SCIENTISTS...

Deer in Headlights. A deer caught in the headlights will freeze, much like an author or reader seeing a p-value < 0.05, and think there must be a real effect. Authors can exploit this phenomenon intentionally or fool both themselves and the reader. Illustration: Tom Boulton

March 16, 2015

Amid a Sea of False Findings, the NIH Tries Reform

By Paul Voosen

How do you change an entire scientific culture?

It may sound grandiose, but that is the loaded question now facing the National Institutes of Health, the federal agency that oversees and finances U.S. biomedical research.

Volume 526 Number 7572 pp164-286

8 October 2015

nature human behaviour

PERSPECTIVE

PUBLISHED: 10 JANUARY 2017 | VOLUME: 1 | ARTICLE NUMBER: 0021

OPEN

A manifesto for reproducible science

Marcus R. Munafò[1,2*], Brian A. Nosek[3,4], Dorothy V. M. Bishop[5], Katherine S. Button[6], Christopher D. Chambers[7], Nathalie Percie du Sert[8], Uri Simonsohn[9], Eric-Jan Wagenmakers[10], Jennifer J. Ware[11] and John P. A. Ioannidis[12,13,14]

Improving the reliability and efficiency of scientific research will increase the credibility of the published scientific literature and accelerate discovery. Here we argue for the adoption of measures to optimize key elements of the scientific process: methods, reporting and dissemination, reproducibility, evaluation and incentives. There is some evidence from both simulations and empirical studies supporting the likely effectiveness of these measures, but their broad adoption by researchers, institutions, funders and journals will require iterative evaluation and improvement. We discuss the goals of these measures, and how they can be implemented, in the hope that this will facilitate action toward improving the transparency, reproducibility and efficiency of scientific research.

GENOMICS

Deflating the Genomic Bubble

James P. Evans,[1]* Eric M. Meslin,[2] Theresa M. Marteau,[3] Timothy Caulfield[4]

Unrealistic expectations and uncritical translation of genetic discoveries may undermine other promising approaches to preventing disease and improving health.

www.sciencemag.org SCIENCE VOL 331 18 FEBRUARY 2011

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John P. A. Ioannidis, MD, DSc
Stanford Prevention Research Center, Department of Medicine and Meta-Research Innovation Center at Stanford, Stanford University, Stanford, California.

Opinion

VIEWPOINT

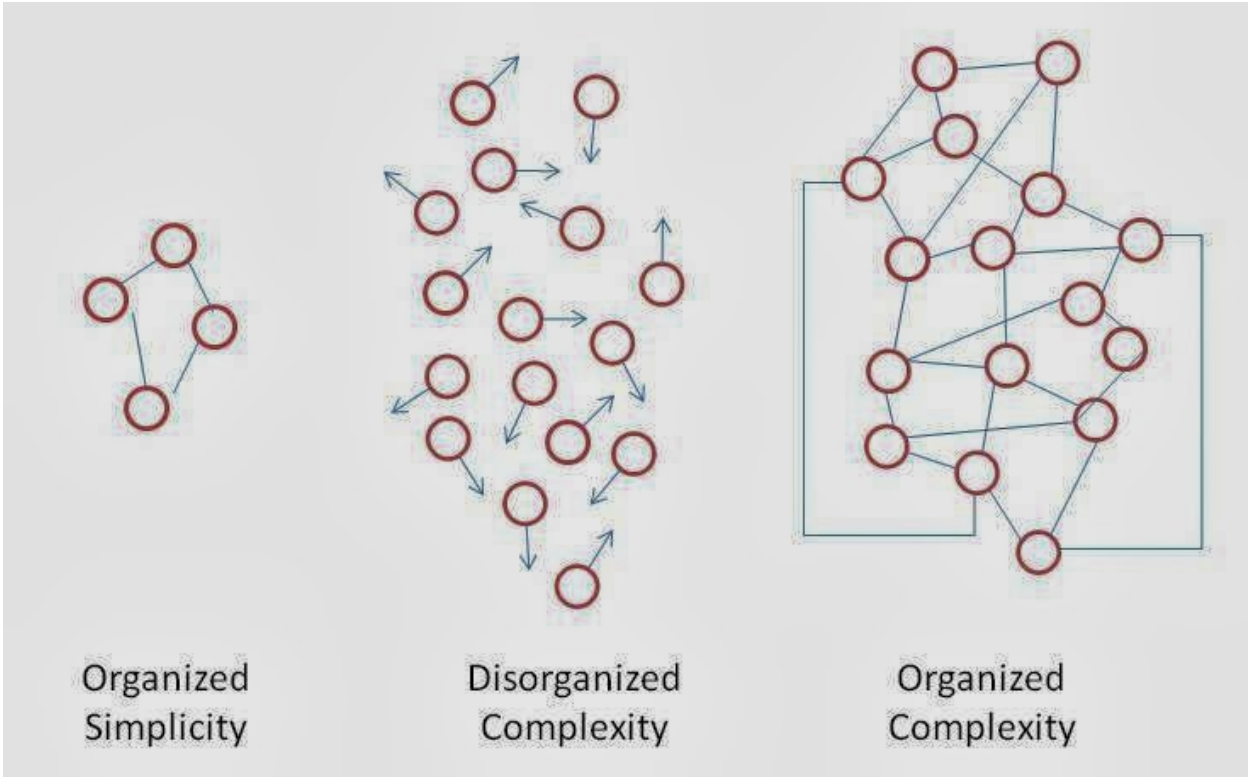
What Happens When Underperforming Big Ideas in Research Become Entrenched?

JAMA Published online July 28, 2016

SCIENCE AND COMPLEXITY

By WARREN WEAVER
Rockefeller Foundation, New York City

"Science and Complexity", American Scientist, 36: 536 (1948).



THE JOURNAL OF CHEMICAL PHYSICS **143**, 010901 (2015)

Perspective: Sloppiness and emergent theories in physics, biology, and beyond

Mark K. Transtrum,[1] Benjamin B. Machta,[2] Kevin S. Brown,[3,4] Bryan C. Daniels,[5] Christopher R. Myers,[6,7] and James P. Sethna[6]
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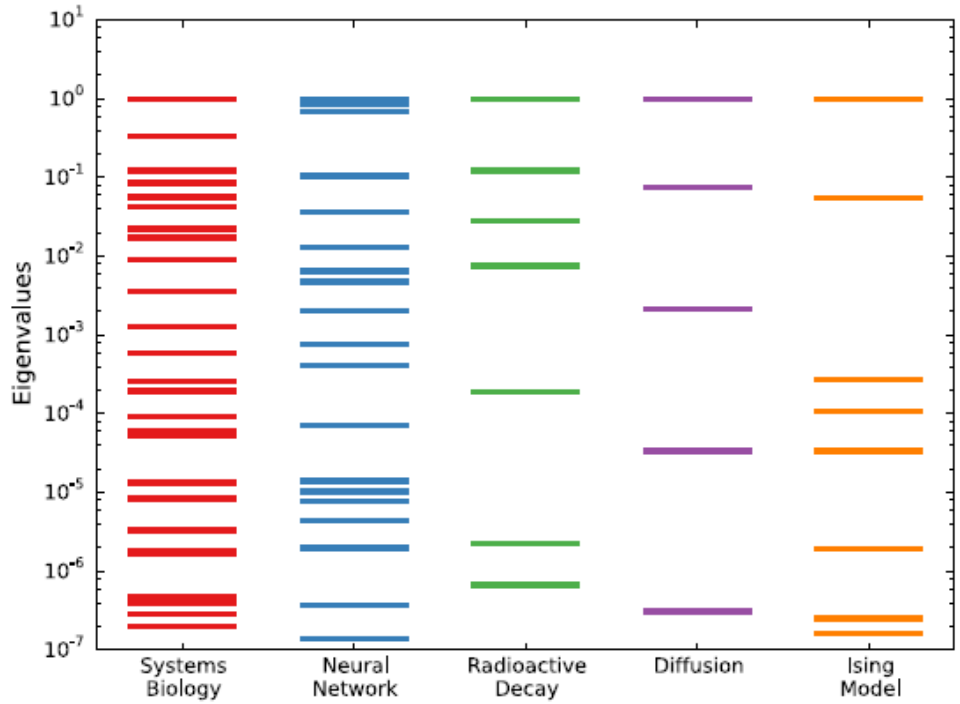
(Received 2 February 2015; accepted 4 June 2015; published online 1 July 2015)

As a young physicist, Dyson paid a visit to Enrico Fermi[1] (recounted in Ditley, Mayer, and Loew[2]). Dyson wanted to tell Fermi about a set of calculations that he was quite excited about. Fermi asked Dyson how many parameters needed to be tuned in the theory to match experimental data. When Dyson replied there were four, Fermi shared with Dyson a favorite adage of his that he had learned from Von Neumann: "with four parameters I can fit an elephant, and with five I can make him wiggle his trunk." Dejected, Dyson took the next bus back to Ithaca.



We noted previously that the characteristic eigenvalue spectrum of the FIM suggests a simpler, lower-dimensional "theory" embedded within larger, more complex "models," and in this section, we make this notion explicit. We will see that

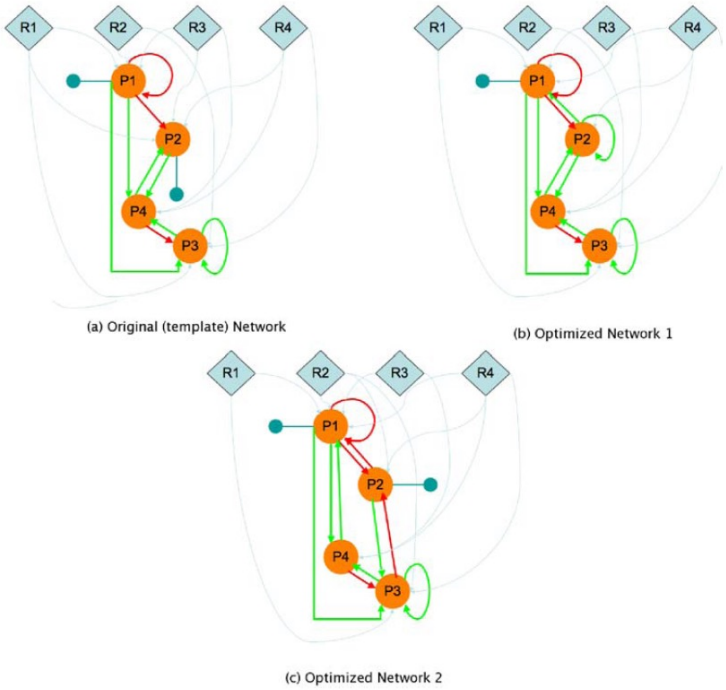
OPEN ACCESS Freely available online

PLoS one

Indeterminacy of Reverse Engineering of Gene Regulatory Networks: The Curse of Gene Elasticity

Arun Krishnan[1]*, Alessandro Giuliani[2], Masaru Tomita[1]

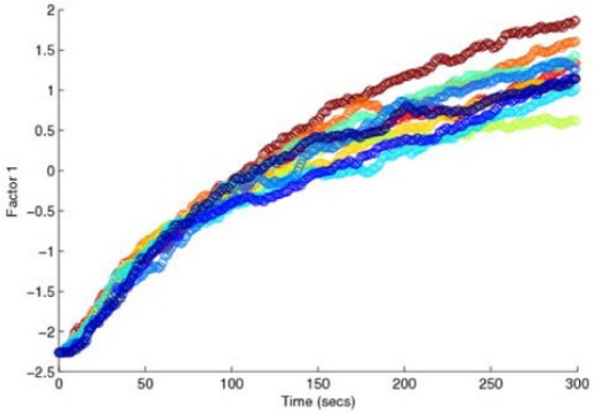
1 Institute for Advanced Biosciences, Keio University, Tsuruoka, Japan, 2 Istituto Superiore di Sanità, Environment and Health Department, Rome, Italy



(a) Original (template) Network

(b) Optimized Network 1

(c) Optimized Network 2

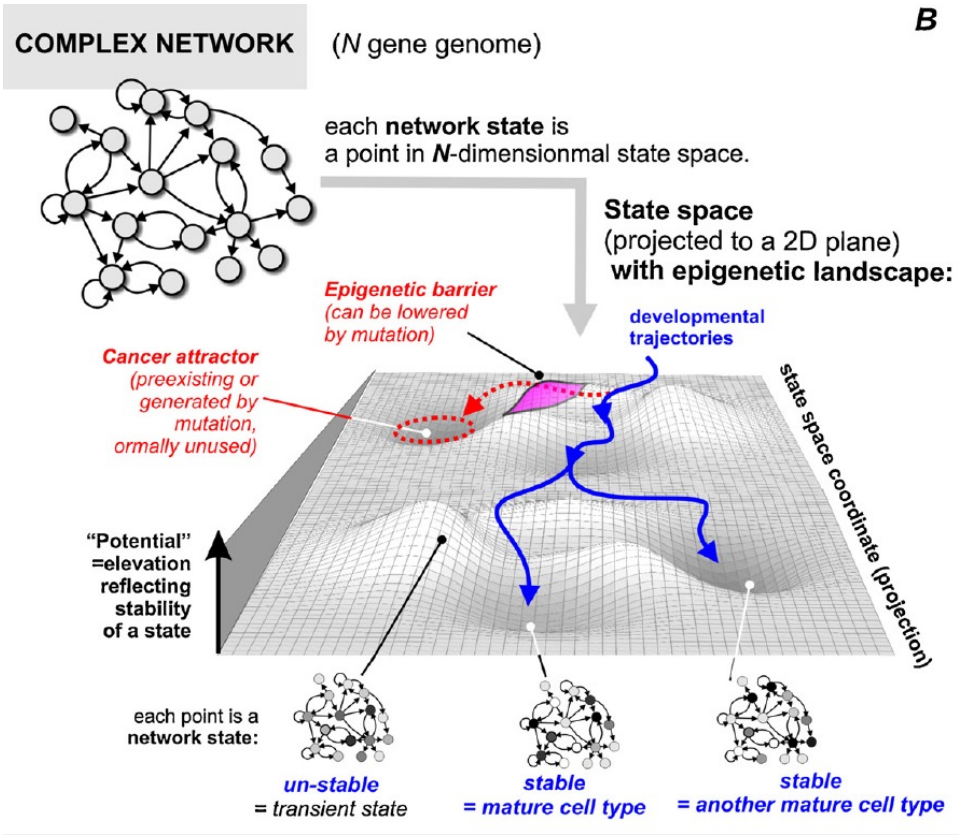


Review

Cancer attractors: A systems view of tumors from a gene network dynamics and developmental perspective

Sui Huang[a,*], Ingemar Ernberg[b], Stuart Kauffman[a]

[a] Institute for Biocomplexity and Informatics, Biological Sciences Bldg, University of Calgary, 2500 University Drive, Calgary AB, Canada
[b] Dept of Microbiology, Tumor and Cell Biology (MTC) Karolinska Institutet, Box 280, 171 77 Stockholm, Sweden



Physical and genetic/biochemical cues at the bifurcation points (hills) may drive the system toward different fate committment (attractors-valleys)

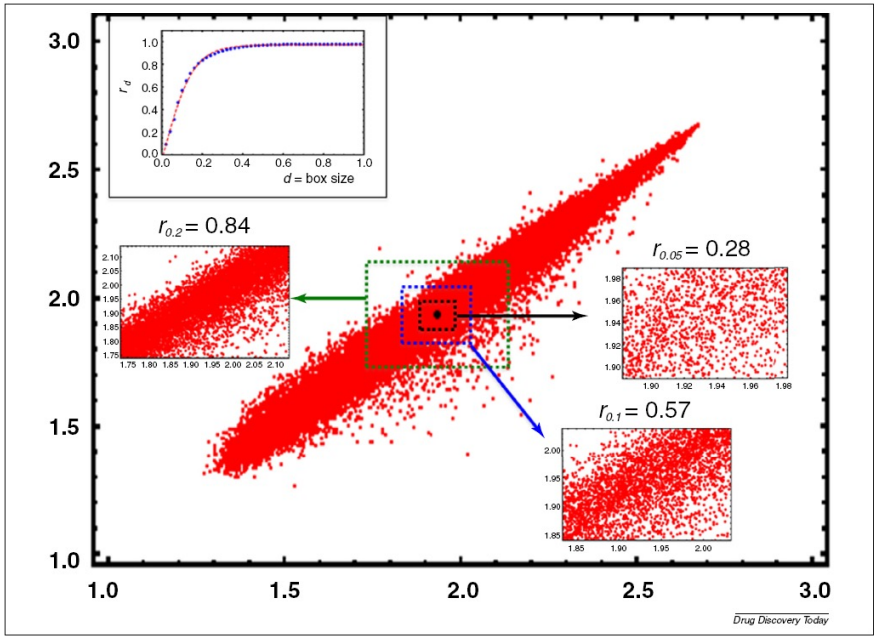
PLOS | BIOLOGY

RESEARCH ARTICLE

Cell Fate Decision as High-Dimensional Critical State Transition

Mitra Mojtahedi[1,2☯], Alexander Skupin[2,3☯], Joseph Zhou[2], Ivan G. Castaño[1,4], Rebecca Y. Y. Leong-Quong[1], Hannah Chang[5], Kalliopi Trachana[2], Alessandro Giuliani[6], Sui Huang[1,2]*

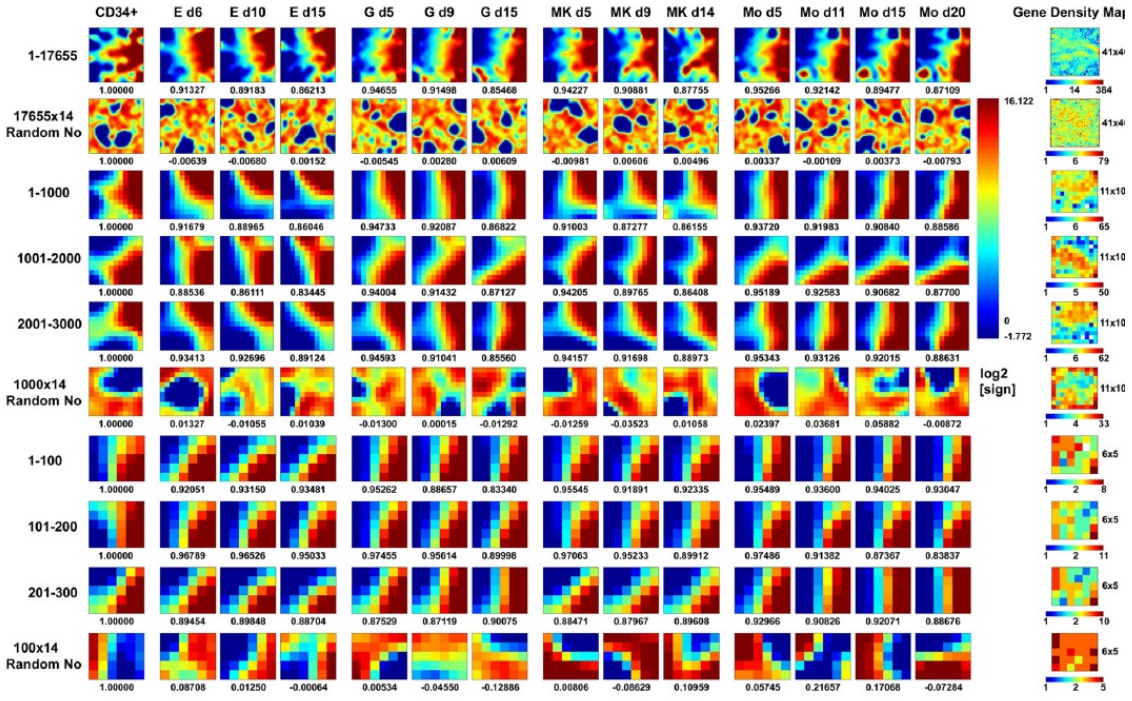
1 Department of Biological Sciences, University of Calgary, Calgary, Alberta, Canada, **2** Institute for Systems Biology, Seattle, Washington, United States of America, **3** Luxembourg Centre for Systems Biomedicine, Esch-sur Alzette, Luxembourg, **4** Corporación Parque Explora, Department of innovation and design, Medellin, Colombia, **5** 5AM Ventures, Menlo Park, California, United States of America, **6** Environment and Health Department, Istituto Superiore di Sanità, Roma, Italy



A

SEQUENCES SIGNAL	SEQUENCES SIGNAL	SEQUENCES SIGNAL	SEQUENCES RATIO	SEQUENCES RATIO
54630 0-71337 All	17655 >500 Expressed	3019 >5000 High Expression	7642 >3x Changed	3561 >6x High Change
		14636 500-5000 Medium Expression		4081 3-6x Medium Change
	36975 <500 No/Low Expression			

B



‘Del rigor en la ciencia’

Jorge Luis Borges

In quell'impero, l'Arte della Cartografia raggiunse una tale Perfezione che la mappa di una sola provincia occupava tutta una Città e la mappa dell'Impero tutta una Provincia. Col tempo codeste Mappe Smisurate non soddisfecero e i Collegi dei Cartografi eressero una mappa dell'Impero che uguagliava in grandezza l'Impero e coincideva puntualmente con esso. Meno Dedite allo studio della cartografia, le Generazioni Successive compresero che quella vasta Mappa era inutile e non senza Empietà la abbandonarono alle Inclemenze del Sole e degl'Inverni. Nei deserti dell'Ovest rimangono lacere rovine della mappa, abitate da Animali e Mendichi; in tutto il paese non è altra reliquia delle Discipline Geografiche. (Suarez Miranda, Viaggi di uomini prudenti, libro quarto, cap. XLV, Lérida, 1658)