

# The 6 main reasons why Google, IBM Watson, and other digital giants should not deliver their promises in life science discovery!

Except, if they decide to really start thinking and doing out of their box!

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*Reason 1-Are the promises of the Digital "revolution" a really novel discovery paradigm or only another bubble from the Silicon Valley?*

Algorithms and mathematical models are remarkable validation/fine-tuning tools when applied to well-defined processes. They are inappropriate discovery tools when applied to multicellular processes poorly understood and/or created from unreliable information. Algorithms, the old name of "Artificial Intelligence", need to follow rules in a world where all actors DO the same.

*Reason 2-The founding basements of the "big data" successes of the digital giants (Google, Amazon, Facebook, Apple, Microsoft, IBM-Watson) built for "the internet" world:*

- The internet world built by human is only very complicated not complex!
- Personal data producers do not "know" what these digital giants do with their "big data".
- Professional data producers do not have a real incentive to lie!
- Algorithm's recommendations based on rules do not need to be fully validated because there is no vital consequence for the user.
- Correlations found by "Big Data" Scientists are useful to optimize "personalized" marketing and business outputs.
- The regulators are aware of the use of the data but the consequences are still limited in the short term.

*Reason 3-Their strong eagerness, shared by their KOL and their Pharma partners, to translate their big data approaches into the life sciences world is clearly "somewhat arrogant" and illustrates their failure to measure the conceptual and behavioral differences between the two worlds. In life sciences:*

- Life's mechanisms are complex and clearly not well described.
- Personal data producers are still not aware of their data usages and their business value.
- Professional data producers globally have a strong incentive to lie due to the "publish or perish" dilemma.
- Algorithms which MUST follow rules are unable to address a complex world where humans do not follow them.
- Correlations generated by the Data Scientists are misleading and do not make the differences between causes and consequences of the diseases, which is the real issue.
- The regulators are fully aware of the risks and possible irreversible consequences for patients (insurance issue, wrong diagnostic ...).

*Reason 4- The Big Pharma R&D model focused on testing new patentable compounds for novel targets based on KOL concepts and academic research has generated a dramatic 5-10% and declining success rate unacceptable for any industry where payers do their job!*

Biotech in their current format cannot be the "solution" to these issues. Except for their business model differences, Pharma and Biotech globally feed their pipelines from the same academic data

world. They use the same development process and have the same phase III safety or efficacy problems, especially in complex human diseases.

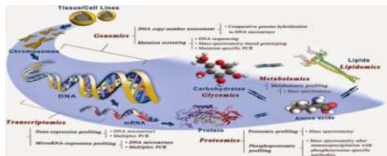
*Reason 5 -A founding reason may originate from the discovery of molecular biology in the 70's, and the endless Omics story that changed the rules of the game and generated 3 major "side effects":*

- Medical research focused on patients' diseases became driven by databases, technologies and IT outputs.
- Leadership switched from MDs & biologists to molecular & IT scientists.
- The discovery issue: Tools, algorithms & concepts from Digital and Technologies giants, valid for complicated systems, cannot address complex systems such as life

*Reason 6-We must urgently change the industry's discovery paradigm!*



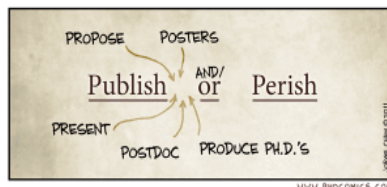
*1-The industry is under high pressure by too high failure rates (90.4%) and payers no more willing to pay premium prices for therapies with very limited patient benefit.*



*2-The limits of the big Pharma model. Decades of investments in Omics technologies and Systems Biology programs produced few relevant results due to 3 "side effects" and a conceptual mistake: Life mechanisms are complex not complicated!*



*3-The "mirage" of Artificial Intelligence (AI) that MUST follow rules in a world where humans massively do not! Currently the "Garbage in garbage out" reality is not correctly addressed by digital giants who consider life as merely complicated.*



*4-The unreliability of scientific and clinical publications is increasing. "Many published research findings are false or exaggerated; an estimated 85% of research resources are wasted." (Stanford University), and the valuable negative results are not published.*

*All the details are given with the sources at the end of the document and on [LinkedIn posts](#)*

*A basic rule to remember: "A wrong concept even invented by KOL and/or promoted by the digital giants will remain in any case a wrong concept!"*

## *What will be the future of Medicine?*

*A-Google, IBM Watson, etc... with their Artificial Intelligences, or  
B-Smart MDs, Biologists, Physiologists educating and mastering them.*

*In any case, we do need cost-effective novel therapies and prevention solutions combining diagnostics, therapies, connected devices and IT technologies.*

*The winners will be the smartest leaders combining the strengths of the two "intelligences" in the right order to answer industry's critical issues?*

In all sectors, CEOs and R&D managers ask their problem-solving partners to prove that their operational solutions are robust, validated and able to address their critical issues. Why should this be different in life sciences? Solutions exist but they require courage and willingness to change dominant thinking.

*What has changed: Solutions not only do exist but they are particularly effective and robust: [They do deliver!](#) [Download the supporting presentation](#)*

We warmly invite you to see the [Big Short Movie](#) about the Subprime crisis. This may help you better understand what we expose here.

Manuel GEA, CEO [Bio-Modeling Systems](#), Chairman, [Adebiotech](#), President [Centrale-Santé](#)

## *For more information:*

[The 7 critical issues R&D managers](#) should urgently address to secure their decision-making process & the future of their company!

1. The [industry is under critical pressure](#) due to [a too high failure rate](#) and [payers no longer willing to pay premium prices](#).
2. The Pharma industry has for decades invested in Omics data production, IT technologies and Systems Biology programs [for remarkably few relevant results](#).
3. The consequences of [life's mechanisms being complex, as opposed to complicated](#), are dramatically underestimated by data-treatment scientists and their algorithms
4. 85% of research resources are wasted. ["Currently, many published research findings are false or exaggerated, and an estimated 85% of research resources are wasted"](#) (Why Most Published Research Findings Are False [John P.A. Ioannidis](#), MD, DSc PLOS medicine). ([METRICS, Stanford University](#)).
5. The unreliability of scientific research:
  - 90% of 53 studies were not reproducible. Amgen's scientists couldn't reproduce the findings of 53 "landmark" articles in cancer research (C. Glenn Begley ex Amgen. [Published](#) in Nature, 2012)
  - 79% of 67 projects were not reproduced by Bayer's scientists trying to reproduce the findings of 67 target-validation projects in oncology, women's health, and cardiovascular medicine. (Florian Prinz, Thomas Schlange and Khusru Asadullah Reu Bayer. [Published](#) in Nature discovery 2011)
1. Negative experimental results are seldom published:
  - 97% of the (37 of 38) positive clinical trial results submitted to FDA were published (source New England Journal of Medicine 2008)
  - Only 8% (3 of the 36) of the negative clinical trials results submitted to FDA were published!(source New England Journal of Medicine 2008)
  - View this MUST watch [TED conference](#) on the topic
  - [Selective Publication of Antidepressant Trials and Its Influence on Apparent Efficacy](#) Erick H. Turner, M.D., Annette M. Matthews, M.D., Eftihia Linardatos, B.S., Robert A. Tell, L.C.S.W., and Robert Rosenthal, Ph.D. New England Journal of Medicine 2008
1. The well-known ["garbage in, garbage out"](#) reality demonstrates that a wrong hypothesis, even if generated or treated by the best Digital and IT technologies, remains a wrong hypothesis.

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