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Headline: Systems Biology Post-Docs May Have A New Best Friend In...Philip Morris?

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When you think of systems biology, you don't ordinarily think of process verification and methodology. Sure, there has been data verification in biology and clinical trials in pharmaceuticals, but best methods and best practices don't really exist for systems biology. And when you think of systems biology, you really don't think of Philip Morris, the cigarette folks.

It may be time to rethink both.

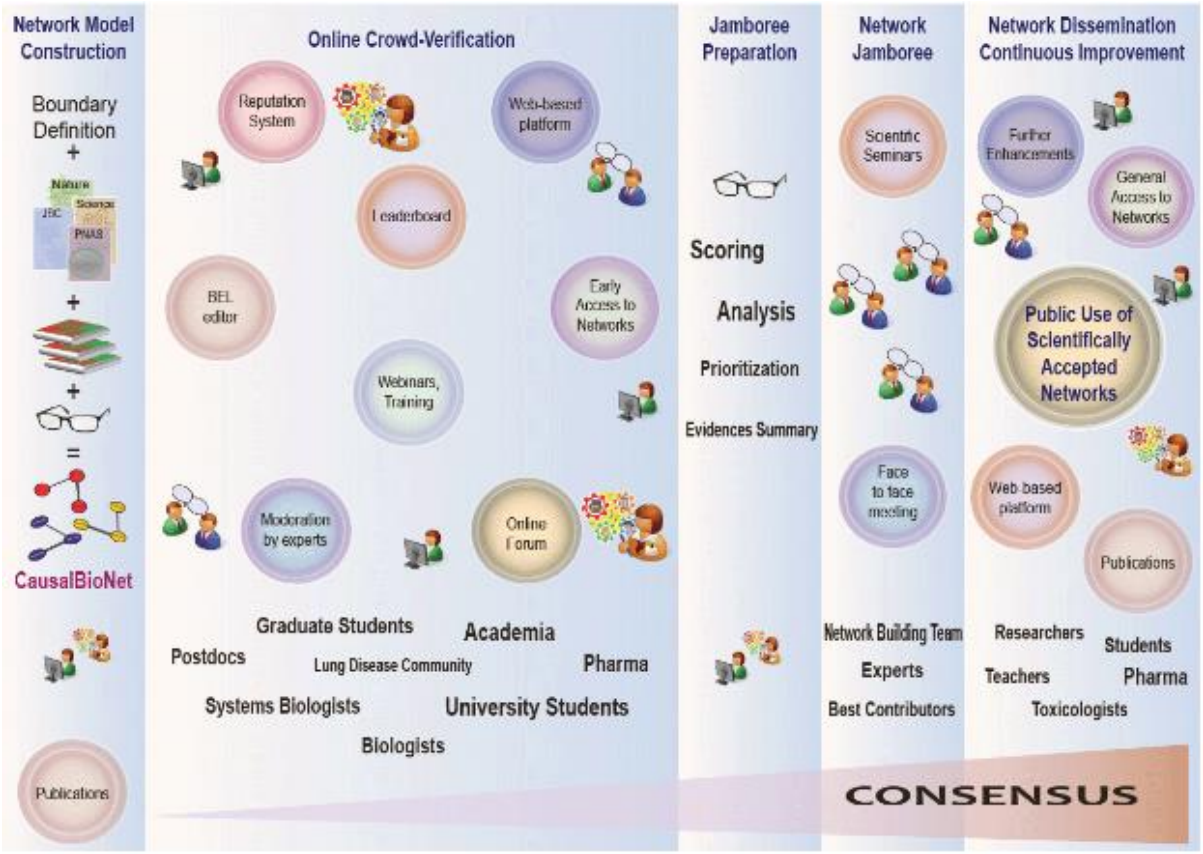
One-size-fits-all science does not work, it is often said. Well, first things first, we can argue it certainly does. Dramatically different fields use the scientific method and 'method' is the operative term. A method implies reliability and consistency. In the brave, new world of systems biology and its big data, being able to think less about the process will free up more time for creative thought about the hypothesis.

So let's talk about IMPROVER.

The money behind this is Philip Morris International, who among the political demographic that aligns with science academia and science media ranks right around Monsanto and John Boehner in ethical credibility. Regardless of what they did 60 years ago, today they are helping to nudge systems biology into the 21st century, by spearheading a project that has no applied benefit, costs nothing for end users and even gives out prize money for the highest-scoring lab. In the process (pardon the pun), they may help to shake up a legacy culture that ordinarily requires post-docs to wait in line and compete against very experienced senior grant writers before they can work on their own projects.

And their first and foremost goal is transparency and crowd-powering answers.

That's right, this ain't your daddy's cigarette company.



Crowd-sourcing verification processes? A jamboree? Who knew systems biology could be so much fun? Source: [sbvIMPROVER]

Okay, so why would independent science media give free publicity to multi-billion dollar companies like Philip Morris and IBM? Shouldn't they be getting love from corporate science media instead?**(1)** For the same reason I am excited about Big Data tools. Government grants are not going to do anything useful in creating tools and methods for Big Data, the private sector will, and they may do it for reasons that have nothing at all to do with science. **(2)** But process verification can help a lot. And I think it is going to be the great equalizer, the thing that makes a small lab in the Mid-West able to compete with Johns Hopkins and its $1 billion in government science funding. But no NSF- or NIH-funded project could ever come close to building it, just like the NSF couldn't create Science 2.0.

I was intrigued by the program so I got on a phone call with Dr. Hugh Browne, Director of Scientific Communications at PMI who is also a PhD in molecular biology with 20 years of research experience, and IBM's Joerg Sprengel, an expert in the application of information technology in drug discovery and development, to talk about IMPROVER. It was an enlightening talk.

IMPROVER stands for Industrial Methodology for PROcess VErification in Research and, while words like 'industrial' and 'verification' are anathema to many academics, young researchers have instead been raised in a culture of technology where lots of companies have done good work that benefits the public and scientists, by making lots of tasks cleaner. Young researchers today embrace the future of technology.

That's going to be a big advantage, because while the previous generation of scientists ran into problems understanding statistics, the current crop of systems biologists will also have that and a lot more processes to deal with, if they are going to successful understanding all of the biological, genetic and chemical processes in play. As quality researchers continue to postpone retirement, the competition for grants - and the average age of the first R01 -

continues to go up. If researchers are going to be able to tackle the fundamental questions of basic research, they can't be bogged down in process thinking.

It may not immediately seem like industrial process verification is a benefit for science but, to people who look at things from a distance, there is an information-induced train wreck coming at the life sciences. Their systems biology work is proof of concept. There's no reason, as Browne and Sprengel noted on our phone call, that the methodology couldn't be used in drug discovery or biotechnology or anything else to come up with best practices. Learning to think like Apple or the chip-package-board verification teams at Intel is a very good idea.

The short-term benefits are obvious: fewer retractions dues to errors, generating data that is 'gold standard' and being able to predict responses due to heat or stress or whatever and having libraries already in place to match. Imagine a systems biology future where you can predict from a rat to a human and know the answers are correct. It's a pretty good place to be.

Does crowd-sourcing systems biology verification interest you? Their Network Verification Challenge closes next week so it may be too late to do anything but it gives you an idea what they are about.

NOTES:

(1) Though invariably money will be invoked. Cui bono? ('for whose benefit?') conspiracy theorists do that a lot. When I am not being called a liberal commie fag junkie by the right I am called an oil-guzzling, vampire-baby-loving Nazi by the left. And then they all claim I am somehow getting rich writing the science they choose not to accept on the Internet. No, I was not paid to write this article. That's also why it took a year to finish. The backlog of stuff I will someday write about for free is pretty big.

(2) Why? Because science is not where the money is. Yes, it is a $120 billion constituency but half of that comes from taxpapers and an alarming number of scientists insist science should have no defined benefit. That is not the way to appeal to the public. Big Data will instead be solved for the benefit of people who control government science - politicians. Knowing which babies to kiss and when to kiss them will be the Holy Grail of Big Data quests for both political campaigns and advertising. Then that process will, in turn, help science.

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