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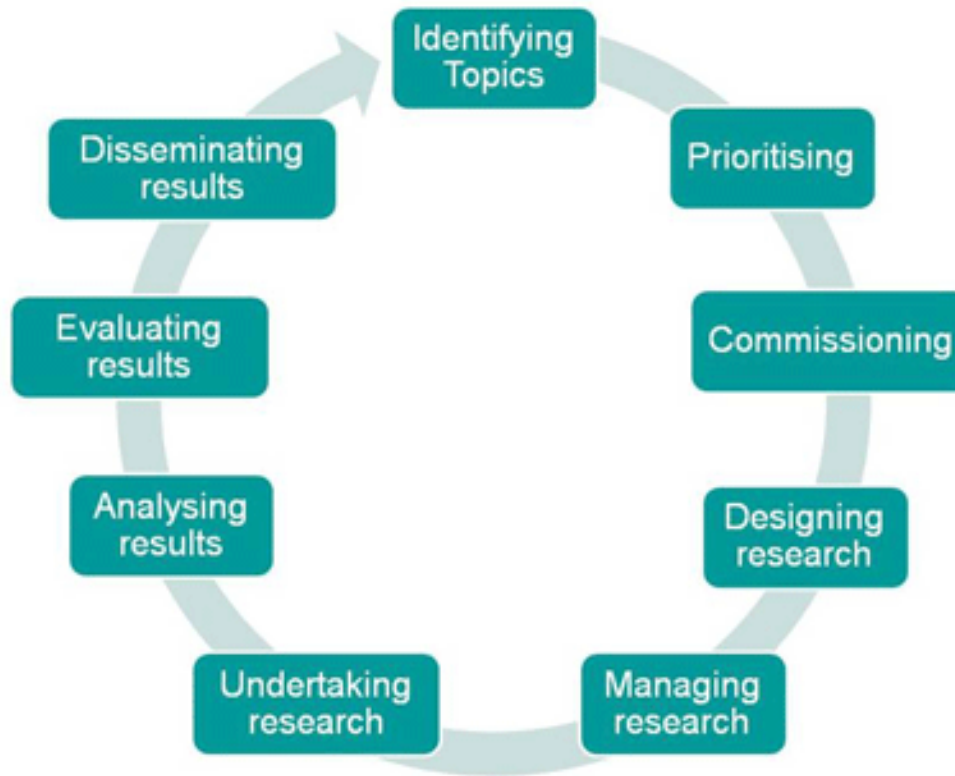


Sheet that just needs to get done in life sciences to make a difference.

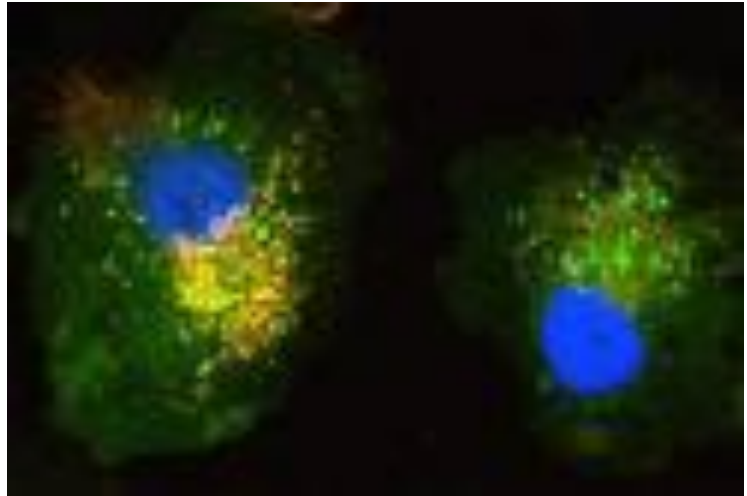
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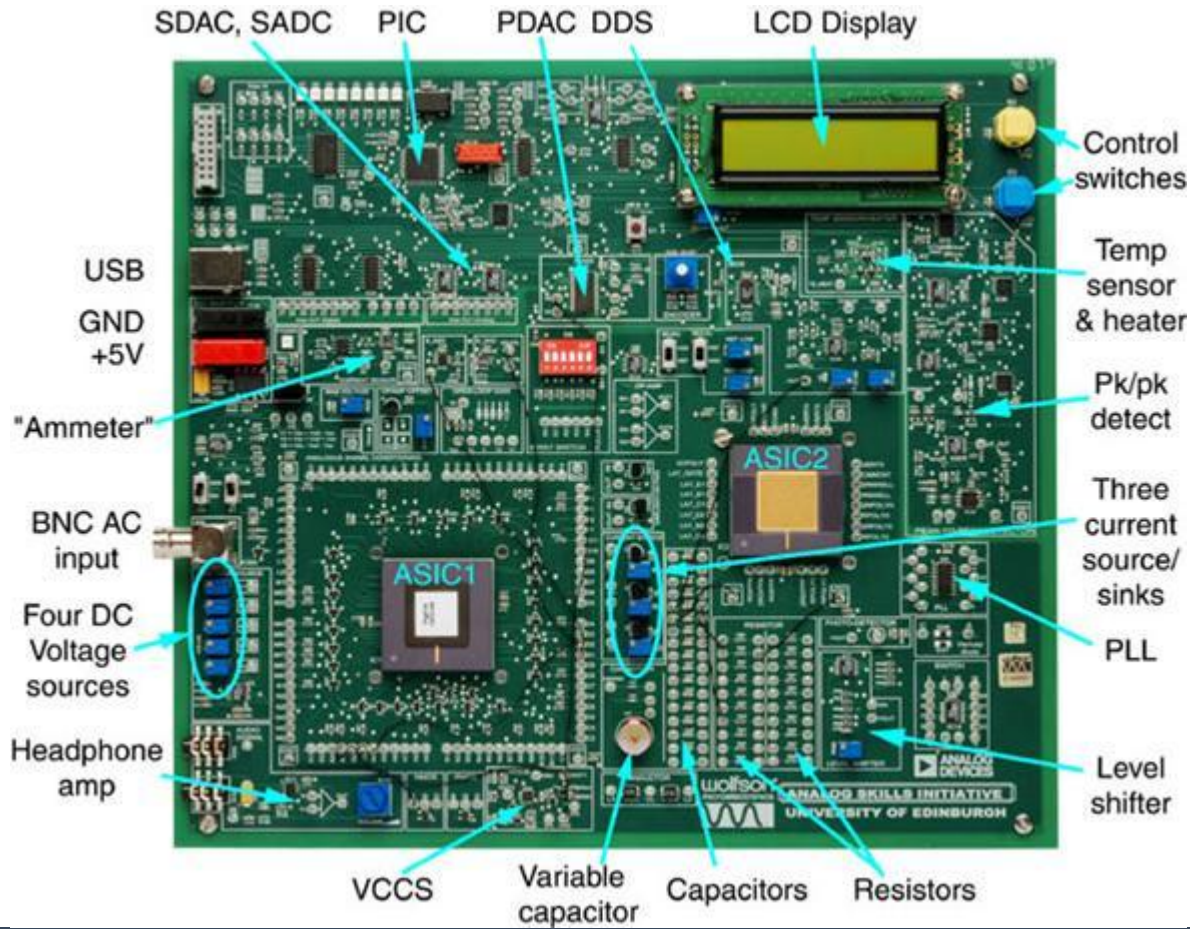
Cycle time is the villain.



Where are the systems models?



Simulation is mandatory.



Industry structure doesn't understand software.

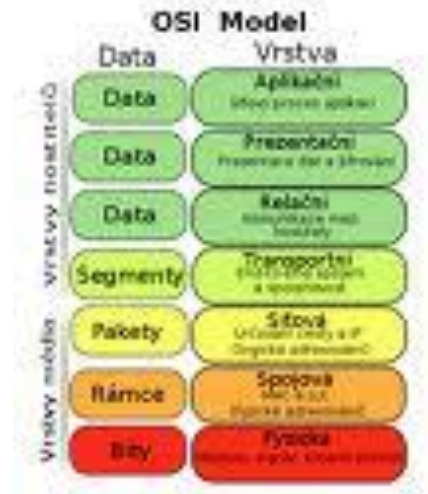


Business + Technology in the Exponential Economy



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Software matters. Open source has 1/2 life of grad student.
Where is cross-omics? Where are analysis tools?
Yikes.....

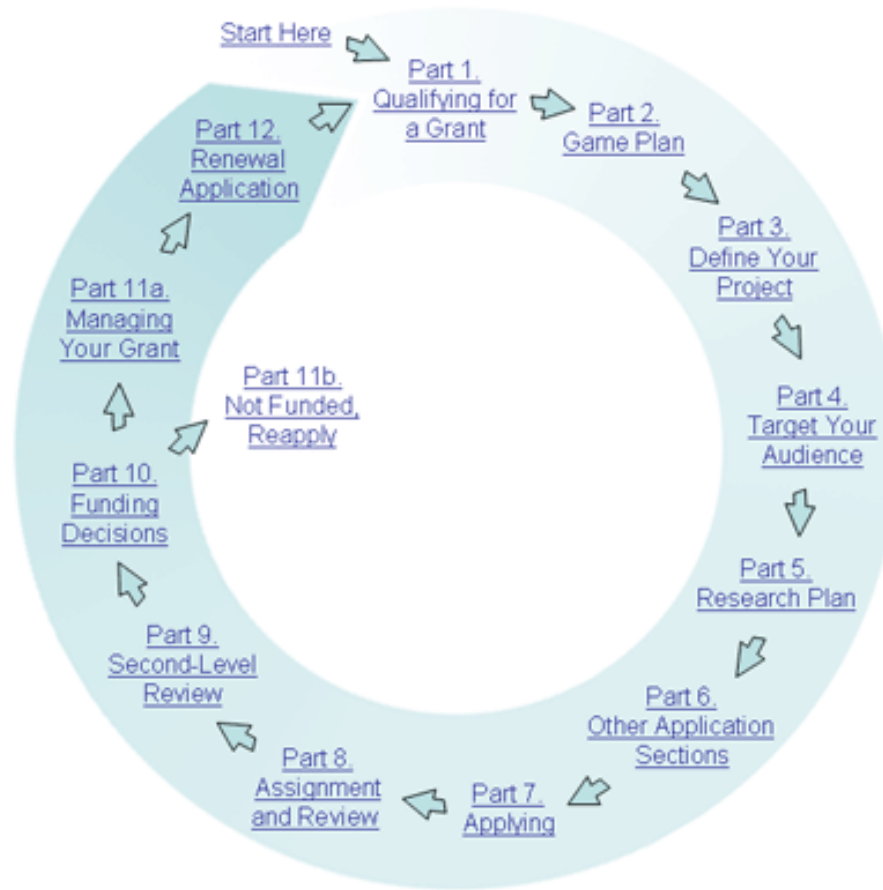


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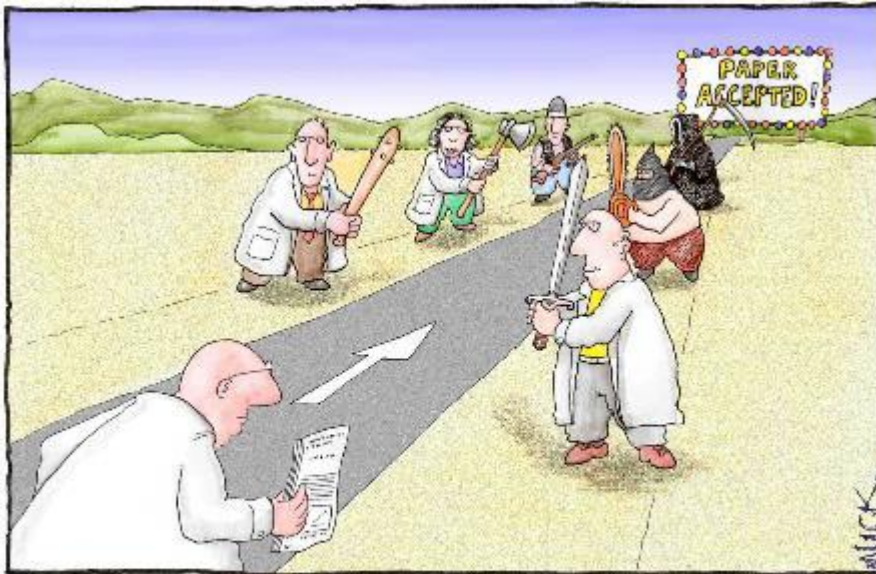


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Funding to publishing takes 3 years and taking longer.



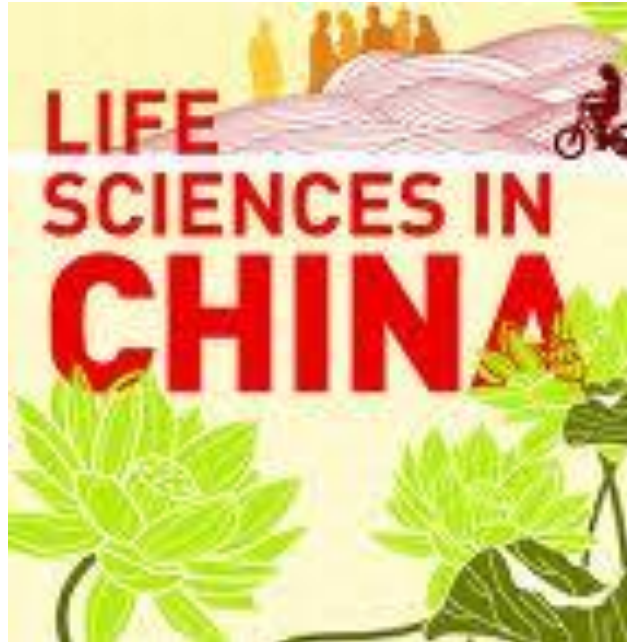
Publishing model is archaic. Open access.



Pharmacogenomics Research:
Can We Make It Happen?



We are broke. They are not.

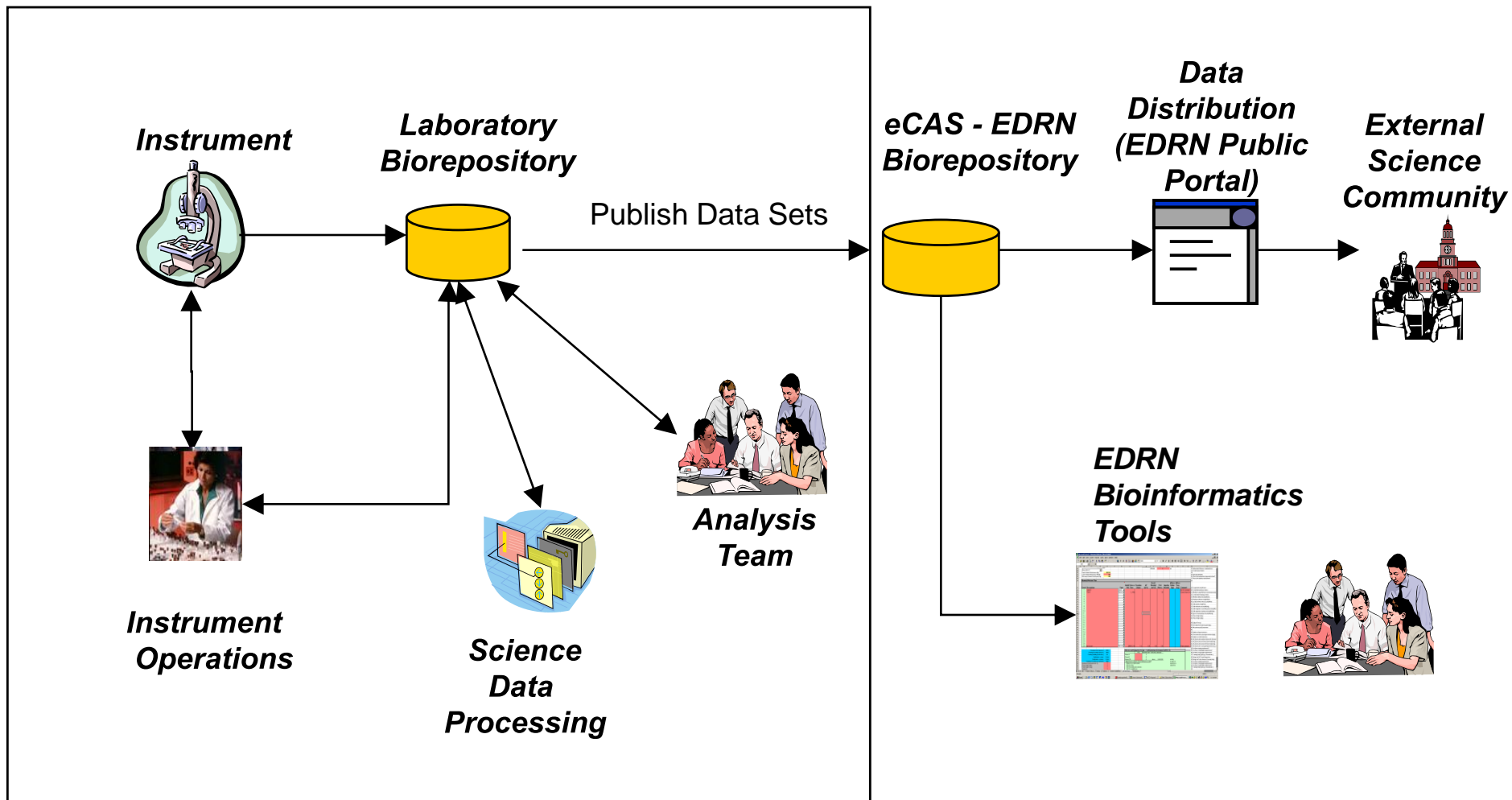


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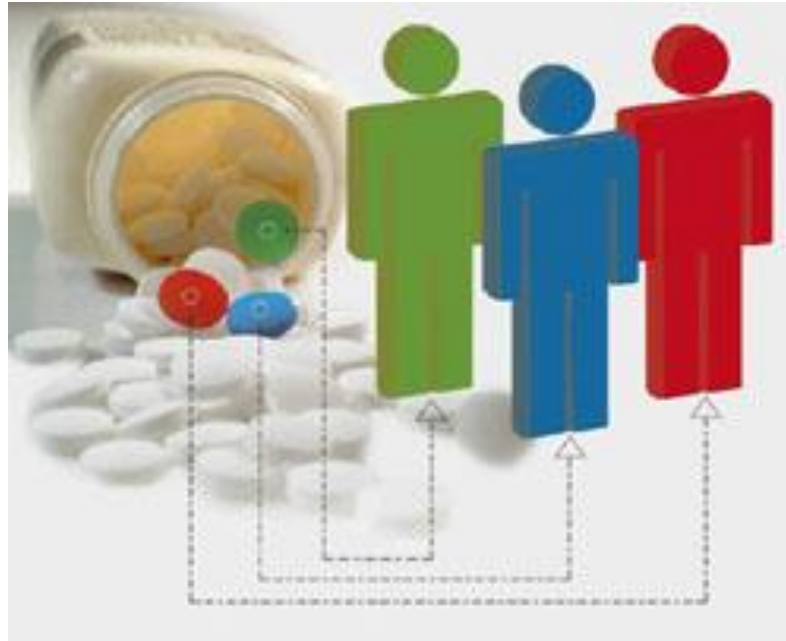


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Quit hiding the data. Virtual experiments.



Personalized medicine is a crock.



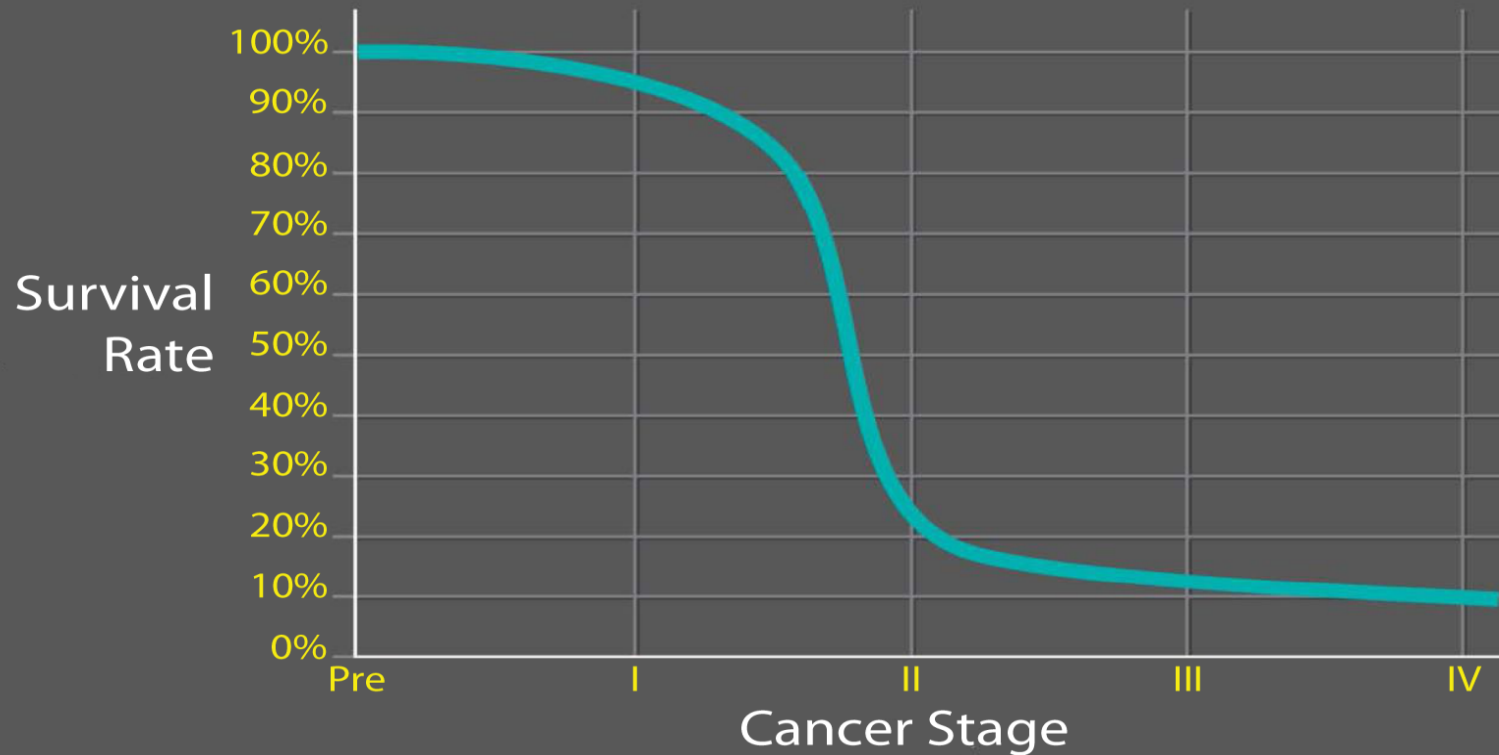
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Health care model needs inversion.



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Inverting cancer.



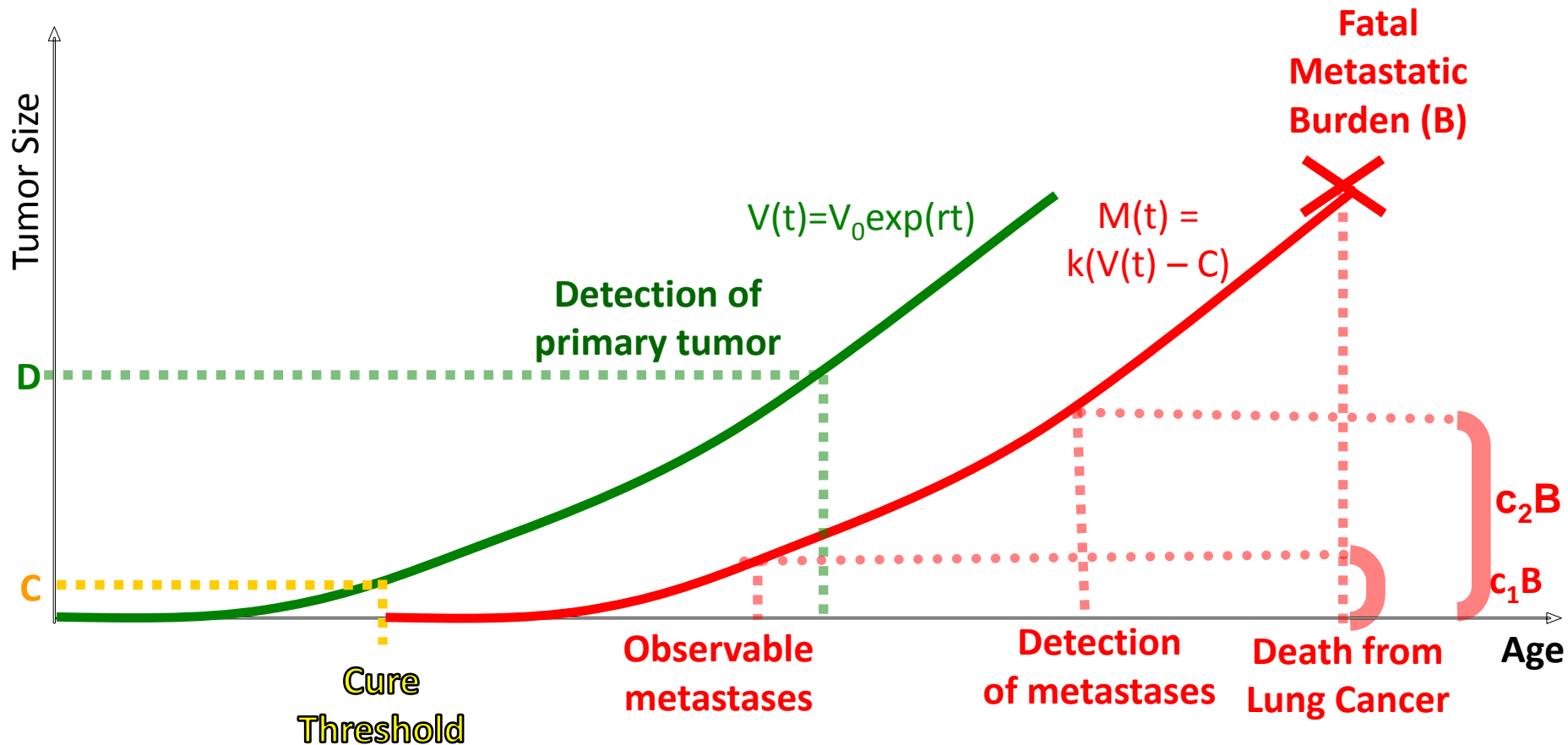
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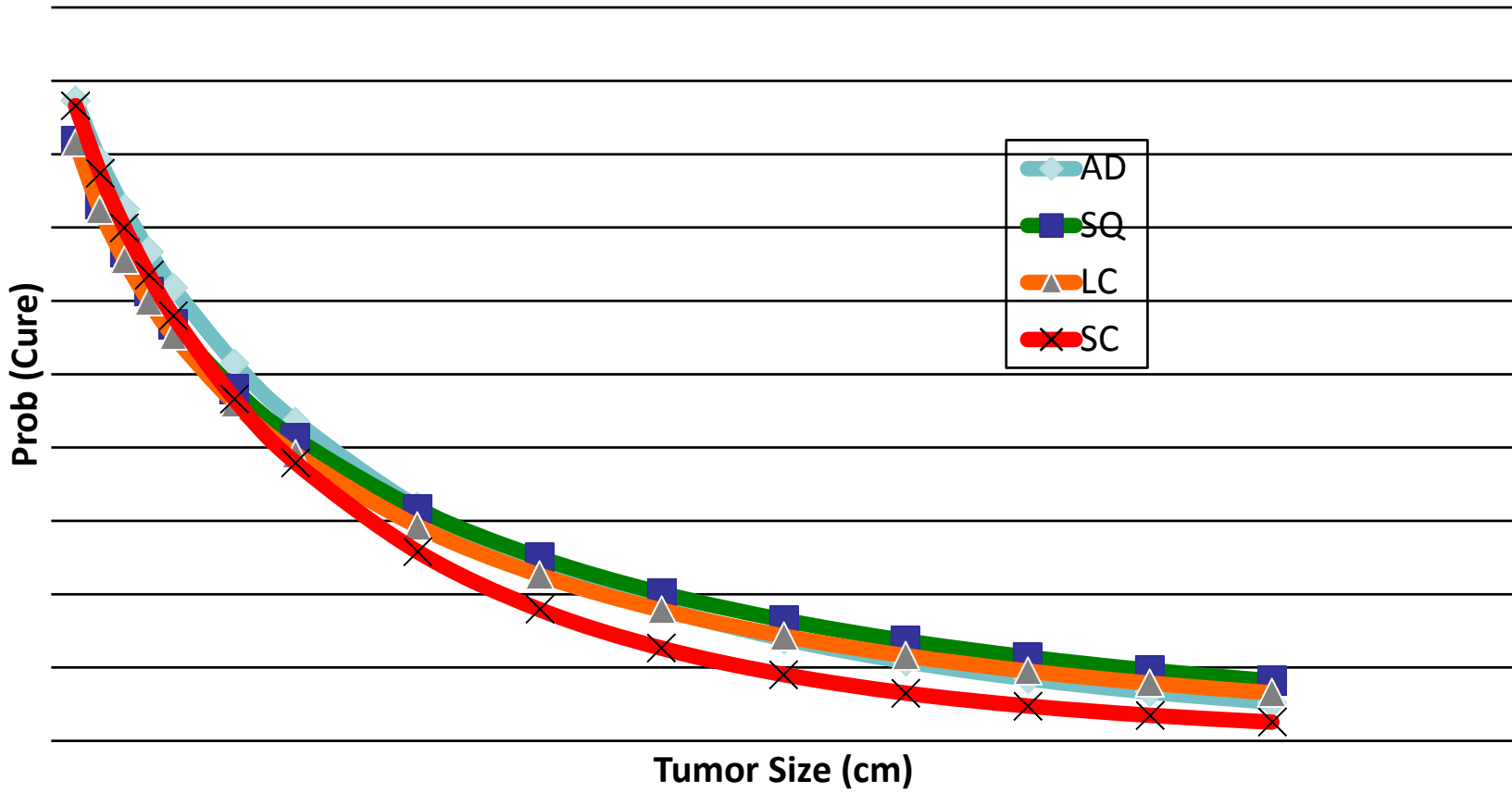


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What about a model to treat disease while it can be cured?

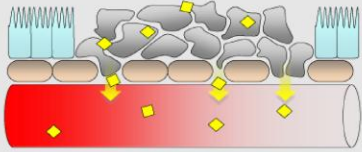


Probability of cure by tumor size (cm)



2 stage tests.

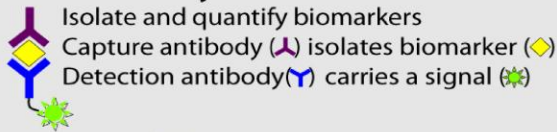
Secreted by tumors



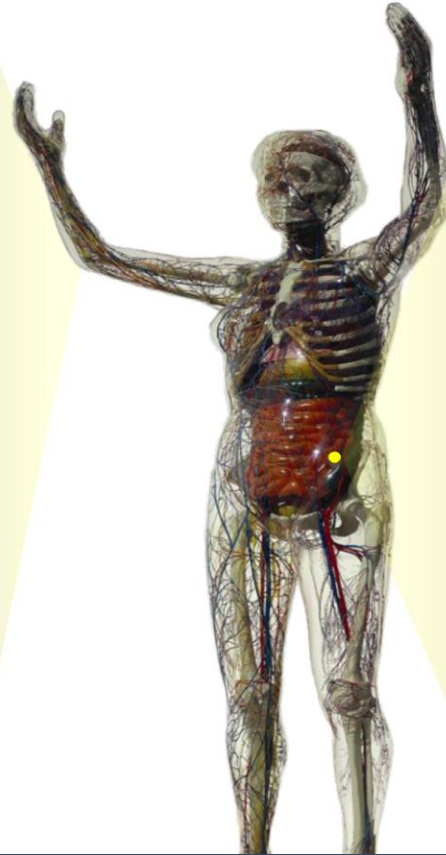
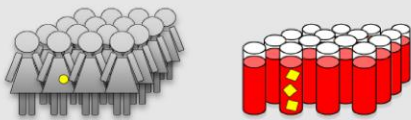
Molecules (◊) that distinguish cancer patient blood from healthy blood



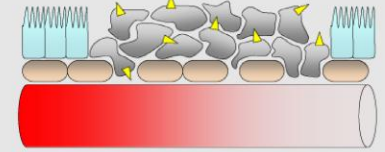
Measured by blood tests



Used to screen a population



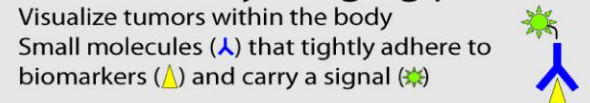
Contained within tumors



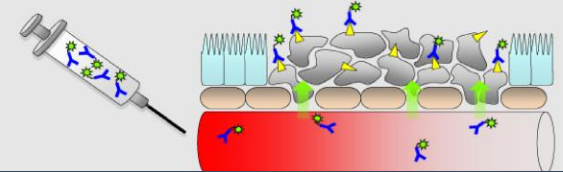
Molecules (▲) that distinguish cancer tissue from healthy tissue



Located by imaging probes



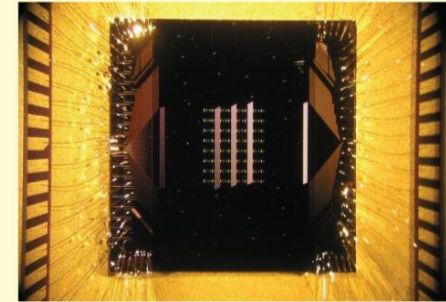
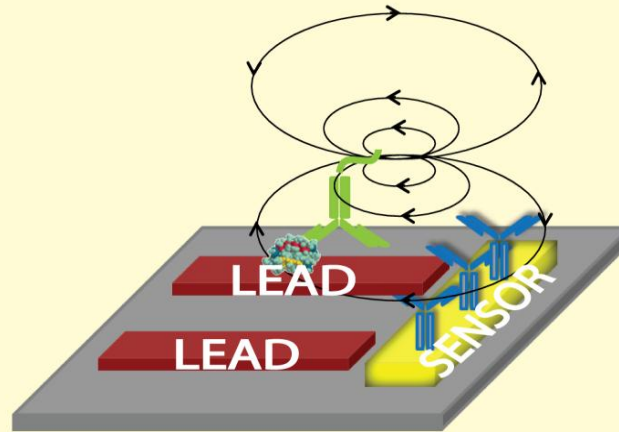
Used to localize the tumor



Engage the engineers.

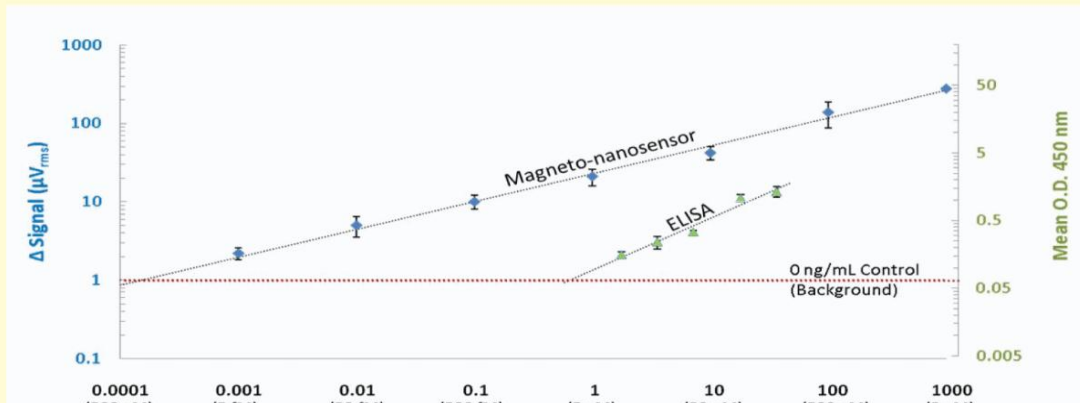
Magnetic Assay Protocol

- Spot antibodies over sensor
- Add the fluid of interest:
Blood
Urine
Saliva
- Incubate
- Detect signal strength



Magnetonanosensor chip close-up

Three orders of magnitude better than ELISA

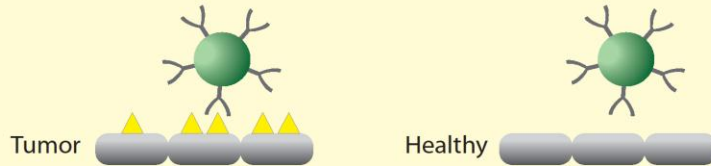


64-plex Robotic Scanning



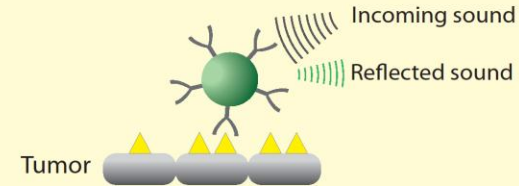
Molecular imaging the missing link.

Targeted microbubbles defined



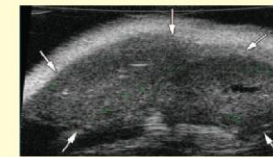
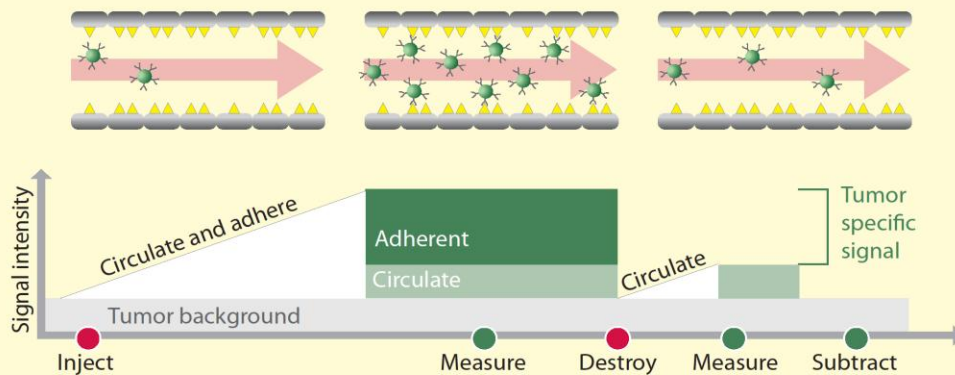
Small gas-filled spheres carrying antibodies that specifically adhere to biomarkers found in tumor vasculature, but not in healthy vasculature.

How microbubbles generate signal

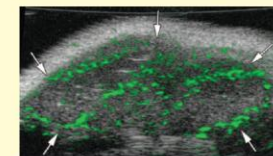


When ultrasound is applied, microbubbles oscillate and reflect a characteristic echo that is distinct from sound reflected by surrounding tissue.

Measuring signal from targeted microbubbles



Non-targeted microbubbles (no antibodies) produce little signal.



Targeted microbubbles produce enhanced ultrasound signal.

Support this model.



Ovarian biomarkers evaluated in prediagnostic blood samples

Novel microbubble/ultrasound-based imaging technique validated in mouse models

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Make more of these.



Sheet that just needs to get done in life sciences to make a difference.

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