

Evolution 2.0 Newsletter

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Why You Can't Understand Cancer Without Understanding Evolution... and Vice Versa

I've lost family members and several dear friends, colleagues, and mentors to cancer. If you've resided on planet Earth long enough, you surely have as well. According to the Centers for Disease Control, cancer ranks a very close second to heart disease as the top killer in the United States. Over half a million people die from cancer every year in the US alone.

My childhood friend Mark Voss has stage four cancer. He's in his early fifties like me. Thus far, they have been managing his cancer with low levels of chemotherapy, diet, and exercise. And, so far, it hasn't gotten worse.

But, I'm fearful if it does get a little worse, the doctors will start "napalming" it with heavy chemo.

I'm in no legal position to dispense medical advice... but, on a personal level, I am afraid he'll get the standard treatment for late term cancer, same one that's been practiced forty years and more. Why?

Two reasons. **First, the success rate for treatment of stage four cancer with chemotherapy hasn't improved in 40 years** because chemotherapy hasn't changed much in 40 years.

Azra Raza, MD, a practicing oncologist who sees 30 to 40 cancer patients per week, says, "In 1977, I was treating a particular cancer with a particular therapy called '7+3.' Now, FIFTY years later **I'm still treating that cancer with 7+3!**"

And the former chief of the National Cancer Institute, says this...

Hi Perry,

After several decades in cancer research - and one decade as principal deputy of the National Cancer Institute, I remain amazed that a disease that will take the lives of 25% of the US population is always a "lightning bolt" for the newly diagnosed. **Even with all the progress we have made, cancer remains for too many a death sentence- often due to advances in knowledge unequally delivered.** I have lost my whole family to cancer save one, my brother, and while knowing everyone in the field I could not save a single one of them.

Second, I believe, based on my investigations, and the research of the sharpest biology scientists I know, that **chemotherapy makes late-stage cancer harder to fight.**



Why has so little progress been made on late-stage cancer?

The main reason has to do with how cancer has been defined. Ninety percent of the time cancer is defined as a disease or a malfunction in the genes of your cells. Some kind of stress (carcinogens, smoking, chemicals) causes a mutation. Some of these “random” mutations *might be* good...and some of them are bad. When they are bad enough, that’s what kicks off the spread of cancer in your body.

What's wrong with this definition? **It gets cause and effect backward.**

The assumption is that everything starts with genes. This notion was popularized by Richard Dawkins’ 1976 book *The Selfish Gene* which is the best-selling evolution book in modern times. So, the assumption goes, if we just understood more about how genes work, if we collected more data about the human genome, we could cure cancer. And, furthermore, we could predict *everything* about a human by studying those genes.

Well, we’ve mapped the human genome 72 ways to Sunday, and we are still no closer to curing cancer. Because there are huge amounts of information about us humans that are NOT in the genome at all.

For example, not even the shape of your body is in the genome! That information is stored elsewhere.

Genes don't control the cell. It is closer to the truth to say, “The cell controls the genes.” The cells are not being controlled by a gene mutation. Your cells are willfully evolving.

Your cells are normally good little soldiers, doing what they need to do to keep you healthy. The skin cells are acting as skin cells and the brain cells are being brain cells. So your body is a magnificent example of perfect cooperation.

Then one day a stressor pushes some of your tissues into “fight or flight” mode. Suddenly they forget who they are. They no longer *want* to cooperate. They start fighting and wreaking havoc.

Your formerly well-behaved cell starts grabbing guns and knives and lashes out. Then he starts recruiting resources. He breaks into the armory and steals a dozen machine guns and a bucket of hand grenades. He starts recruiting blood vessels to send more nutrients and oxygen to make him strong and dangerous.

Then he starts multiplying. Churning out millions of little rebel soldiers in his image.

You may have noticed that I’m describing this in *anthropomorphic* terms. Yes, I’m granting your cells human characteristics like will, consciousness and decision-making. This is quite intentional.

The traditional view of cancer, which is based on the traditional view of evolution, presumes everything happens more or less by blind chance. Those who hold this view, believe that everything I described above happens randomly, without purpose, without intention, without consciousness. It just starts, and then proceeds mechanistically, like so many pieces of a broken machine.



To speak of cells having consciousness, agency, is blasphemy in traditional biological circles. Most molecular biologists will not tolerate such heresy. There *cannot* be purpose and intention and intelligence at the cellular level. It *must* be just dumb machinery... or else their entire world-view crumbles under their feet.

They believe that, “If we could figure out the right bomb and drop it in the right place and the right time, we would destroy the machine, and the war would be over.”

Images of napalm clouds and carpet-bombing in Vietnam roil in the imagination.

The assumption is, if we could figure out “the mechanism,” we’d possess the magic napalm that would work on every cancer.

For the last fifty years, the napalm they’ve been dropping under this justification has been chemo. Hundreds of billions of dollars have been spent on the napalm, and not a great deal has changed in treatment in 30-40 years. We’ve only taken a scant few acres of occupied territory back from the enemy known as Stage 4.

The rebels are still as entrenched, incensed and victorious as ever.

Why does chemo make cancer **HARDER** to fight?

Here is what happens when the chemo attacks: The “napalm” kills 97% of the rebels (and a month later you come home from the doctor with a glowing report that your tumors have shrunk), but the 3% that survive the bombing start crafting new battle plans. They change tactics. They respond strategically to the bombing and... evolve their plan of attack.

This is the part the old-school generals and majors don't understand.

It is not accidental. It's not just random copying errors. It's not just natural selection. It's not even *mechanistic* per se. It is a vast innovation repository that can evolve faster than any napalm distribution scheme you can conjure up. If you attack it with dumb, mechanistic fire from above... these rebels outsmart you three times out of four.

And if your technique worked? If you actually do knock it out and survive cancer? It's not because the generals and majors outsmarted the rebels and figured out the best way to bomb them into oblivion.

It's because you got lucky... and your luck was as likely due to the resourcefulness of your own body as the advances of modern medicine.

Rebels know how to change their plan of attack by **accessing their evolutionary toolkit**. They know far more about their toolkit than we do! The rebel cells' understanding of the weapons and tactics they can employ is vastly beyond what we humans possess.



We humans today have a very surface-level notion of cellular evolution. Read my book *Evolution 2.0* to get a foundational understanding of just how shallow and simple-minded the Neo-Darwinist version of evolution really is, which is the interpretation most laypeople and research scientists adhere to.

This simple-minded understanding is a major reason why millions of people die from cancer every year. We have met the enemy and the enemy is us.

When the cancer first appears, it's one "species" of rebel soldier. But after the napalm hits, and 90% of the soldiers die, the remnant devises a new strategy... suddenly you have a thousand "species" of new rebel soldiers.

Now you're not just fighting against the Viet Cong. Now you're fighting British, Americans, Russians, Chinese, Venezuelans and every other nationality of soldier. Each have their own specialized tanks, battleships, and nuclear missiles. And every month more nations join them. And every month they devise new weapons ten times more deadly and stealthy than the old ones.

When it finally metastasizes... you're in checkmate. That's when the rebels blitzkrieg out of their own territory and head into world-domination mode. They want your lymph nodes. They want your lungs. They're like Sauron in Lord of the Rings: they want ALL the rings. Their *masterful, swift and innovative* evolution has made them all-powerful.

Meanwhile, chemo hasn't changed much in 50 years!

Curing cancer is easy. The HARD part is...

Let's leave the field of biology completely for a moment, because there are systemic, economic forces allied against finding and popularizing a real cure for cancer.

A doctor I know uses drugs *not designed for cancer* to treat his cancer patients. These drugs have been around for 20 years. The patents have expired. They're cheap, easy to get. And they work. And he's a fully accredited medical doctor. Not a New Age quack. And, because he has some latitude to what he prescribes, he has the legal authority to recommend these 'non-cancer' drugs.

But he tells me: "If I wanted to get full validation that these drugs work, it would cost one hundred million dollars to do the test. Nobody's ever going to spend a hundred million dollars on a drug that's **20 years old**. These drugs are effective, but they will never be widely prescribed. Why? Because they don't pass all of the checkpoints. Plus there is big money in late-stage cancer treatment. Chemo treatments run as high as \$12,000 per month in the US."

But early detection works. We have made *huge* strides and formidable progress in the treatment of EARLY-stage cancer.

I've heard multiple accounts of chemotherapy companies buying out early-detection companies and shutting them down. **Cure has always been a bigger money-maker than prevention.**



As a marketing professional I can assure you this is true. In fact, most of the time when a client comes to me with “prevention” of just about anything (even a car engine breaking down), I always try to get them into the cure business instead... because there’s about 16X more money there.

Why would big chemotherapy companies want to throttle their best source of profitable “traffic” (to use a marketing term) by reducing the number of late-stage cancer sufferers with early detection methods?

I believe the economic will be a harder problem to solve than actually curing cancer!

If we can redefine cancer and evolution, and if we can stop underestimating our enemy, I believe curing cancer will be the easy part. I have no difficulty imagining a future where a \$6,000 treatment is hands-down superior to the current \$60,000 chemotherapy.

The problem is one that any savvy marketer can understand: If you’ve been selling BMWs for \$60,000 and suddenly you can only sell used Chevrolets for \$6,000... how are you going to keep that dealership running?

The economic problem is trickier than the medical problem!

Don’t get me wrong. The folks administering the \$60,000 solution that doesn’t work very well are not evil people for the most part. They are good people trying to save their fellow humans from a terrible fate. **But they are optimizing within a system that is fundamentally wrong.** And it needs to be abandoned for another approach.

But how do you do that?

I don’t know.

And the problem runs even deeper, because I do not believe that it is possible for a system that optimizes for short-term profit can maximize long-term patient health.

Case in point: Up to this point in my life I’ve spent *very* little on my own health care. Why? Because I’ve been incredibly healthy. That means I’m a terrible customer for the health care system!

Do you see what we are up against? Do you understand why we are losing this war so badly? Do you see why a new theory of cancer and a new theory of evolution are necessary to save millions of lives... probably the lives of people you know and love?

That’s the horror. That’s what we are up against. If you have ideas, I’d love to hear them.

Is there Hope?

The first step to winning the war against cancer is humility. We must admit we don't know nearly as much as we think we do. We must admit that our enemy is much smarter than we thought he was.



Then we must admit that understanding cancer is not a mechanical, chemical question. It's more like a question of *identity*. A question of self. It's a far more ancient, human, complex question than ever imagined. Scientists have long thought that these questions of self and identity were merely philosophical or psychological or perhaps even 'spiritual' and had nothing to do with biology. I contend that these questions have *everything* to do with biology.

Dear reader, what makes you...you? Is it just your particular combination of genes and tissues and chemicals? Or is there something more, something deeper, something mysterious, that bequeaths your true identity? I believe there is. I believe you are not merely a collection of matter and energy. And I believe that about you all the way down to your cells.

I, and some of the wisest scientists I know, believe cells are self-aware. Cells have will. Cells make decisions.

In my talk at our Cancer and Evolution symposium, I asserted that in biology, there are three levels of causation: chemicals, code, and cognition.

The chemical level is matter and energy—the periodic table of elements, Newton's laws of thermodynamics. The stuff you learn in physics and chemistry classes.

The code level is the entire world of messages, communication, symbols, languages, computer programs, mathematics, and logic.

As I've already shown, we've tried to solve the cancer question at the chemical level. And have not made much progress in fifty years. We've arguably made things worse.

And now in the last 20 years we've tried to solve the cancer question at the code level with billions and billions of dollars in genetics research. This approach has a far better chance of success than dumping chemicals. Consequently, the new analogy is that cancer is like a computer virus. If our antivirus detects a new, malicious "code"—a new virus—all we have to do is add a few lines of code to the antivirus program, and we'll prevent the virus from doing any damage.

But cancer is not a mechanical computer virus. It's a self. It has agency. It has the ability to alter its own identity. So every time the "antivirus" changes its code, the cancer cell will dip into its bottomless bag of evolutionary tricks and find a way over, through, around and under the defense.

To paraphrase Dr. Ian Malcolm in *Jurassic Park*, "Cancer finds a way."

The cognition level is identity, will, consciousness. Obviously, this third level is much harder to define. The cognition category is *squishy* because nobody truly knows what it is. But I believe this third level of causation, *cognition*, is where we will find the solution to cancer. It is more like a psychology question than a chemical or code question.

What is the psychology of a cell that pushes it to fight or flight mode? Why does it forget it's a good soldier cooperating with all the other good soldiers? Why does it suddenly change its identity to a rebel, hell-bent on murder and destruction? And can we switch his identity BACK to good soldier?



These might sound like crazy questions. But the answer to that last question is yes. Yes, we can.

Michael Levin, who presented at the Cancer & Evolution symposium, induced cancer in frogs using bioelectric fields. **Then he reverted the cancerous cells back into normal, functioning cells.**

Yes, “switching cancer on and off.” Changing cellular **“identities”** from normal law-abiding citizen, to radical violent terrorist, and back to normal peaceful citizen!



I’m surprised platoons of oncologists haven’t swarmed his lab at Tufts University and regaled him with questions. Yet I’m not that surprised... because the existing paradigm doesn’t have a folder in which to file such information.

Levin’s experiments raise profound questions about the entire concept of self and identity. We are not in the land of chemistry anymore. It’s not genetics either (in fact, the results of Michael’s experiments contradict age-old genetics wisdom). We’re in something like sociology now. And if you can apply sociology to tissues and biology, then you just bridged disciplines. You just created a synthesis. You just made vast realms of human knowledge in one department available to another department.

More Hope for the Future

As I explained above, in late-stage cancer, attacking it with chemicals makes it worse. And the reason we insist on attacking cancer has to do with a fundamental wrong fork in the road that evolution took 100 years ago.

There are two stages of evolution. **Microevolution and macroevolution.** With microevolution, stressors cause incremental changes. Think “dog becomes wolf.” This is what’s happening in stage one and stage two cancer. The new rebel soldiers are just slightly different from the good soldiers. You can cut them out with surgery, or you can knock them out with therapy. Sometimes stress reduction, diet and exercise might be enough. You can defeat them at the chemical level. As all of us know people who have succumbed to cancer, many of us also know people who were lucky enough to catch it early and beat it.

But when **macroevolution** kicks in, things grow far more complicated, as I explained above. Think “dolphin evolves into man-eating shark in 60 days.” Changes come fast and furious. Now you can no longer defeat it at the chemical level. In fact, *we know for a fact* that **current treatments push cancer cells into macroevolution.**



Our success with early-stage cancer, and the pitiful failure with late-stage cancer, should press us to invest in much better early detection methods. Jinsong Liu, a pathologist at M.D. Anderson, tells me there's a window of time in which cells can still be brought back. A space where they can be made to remember their original identity and flip back to normal like Michael Levin's tadpoles. But that window doesn't stay open very long.

In the next issue... even more hope for the future.

What Can You Do Be a Part of Evolution 2.0?

Evolution 2.0 is me, my assistants Lorena Ybarra and Emily Brookins with volunteer Sam Bart. Joana Xavier, a postdoc in Europe, vets our prize submissions. Plus a few other precious volunteers contribute hours here and there. **We can use your hands-on assistance.**

We have initiated new forays in cancer research that are consistent with the Evolution 2.0 model. Our organization is a 501c3 not-for-profit, so you can go to evo2.org and make a tax-deductible donation.

We could also use some volunteers.

We need people who are skilled in...

- **Administration and project management**
- Finances
- Scientific papers, research, and projects
- High-level mathematics
- Film (documentary screenwriters, editors)
- **All** forms of marketing ad copywriting, buying Google, YouTube and Facebook traffic, writing blog posts, shooting videos, podcasts, publicity angles, news media

If any of the above piques your interest, please reach out. Email evolution@evo2.org, let us know what your skills are and how you might like to help.

This is signature work. In the 22nd century, everybody is going to know how important this is. I believe that deep in my heart.

The average bear doesn't see how far-reaching this is. Most folks can't see past their next Instagram photo. But we are shifting the foundations of civilization.

We can save millions of lives. Maybe the life of someone you love. Maybe *yours*.

Carpe diem - Seize the day.

Perry Marshall

