

## Combating Misinformation

### *How to Avoid Becoming the Next Wei Zexi*

On April 12, 2016, a 21 year-old college student named Wei Zexi [died](#) after receiving a grossly exaggerated [experimental treatment](#) for [synovial sarcoma](#), a very rare form of cancer. He found the treatment through Baidu, after going through traditional forms of treatment to no avail. The link was an [inconspicuously marked paid advertisement](#), and although the hospital was a legitimate military hospital, the department offering the treatment was reportedly outsourced. Hundreds of thousands in wasted funds later, Wei [posted his experience online](#), placing the blame on Baidu for putting profit above all else.

As expected, internet outrage ensued. Armed with righteous indignation, people blamed everything from lax regulations, evil corporations, greedy hospitals, western medicine, charlatans, the legacy of [barefoot doctors](#), to the victim himself. Instead of participating in the blame game, let's take a more productive approach and see if we can avoid similar situations by applying some skepticism.

### *The Age of Misinformation*

The digital age ensures that information is always at your fingertips without the need to flip through flattened dead trees. Along with the ease to access information is the ability to quickly create and share information, which is liberating but also dangerous. Without traditional editors, anyone can put up an authentic-looking, fact-free webpage with information pulled directly out of, uh, thin air. As a result, most of the information online is actually misinformation.

Schools do not prepare us for this, as our education system responds to the real world about as nimbly as a sloth, especially in Asia. Not surprisingly, students often graduate feeling fully prepared for life...in the 18<sup>th</sup> century. They are given a curated set of materials to learn, and their success is measured in tests against these "truths". The problem is, if students have only been exposed to truths, how do we expect them to recognize falsehoods? One cannot be expected to navigate the rough seas of misinformation having been taught to swim in a heated pool.

### *How to Judge the Accuracy of Information*

So how do we judge if the information on a webpage is accurate? Here are some things to check for:

1. Author qualification. Is the author qualified to make the claims on the topic? A "Dr." prefix in front of the name does not automatically mean one is qualified; it has to be in a related field.
2. Claims. Look at the primary source (the actual study), and see if it supports the claim. Check if the study is preliminary or well established. Hyperbolic terms like "miracle", "breakthrough", and "magic bullet" are excellent indicators of unreliable information.
3. Overreliance on testimonials and experience. Anecdotes and narratives may be emotionally appealing but mean practically nothing.
4. Conspiratorial/ideological slant. Language like "the drug companies don't want you to know about this", "Big oil/pharma/GMO", "evil (corporation name)" indicate binary thinking and a lack of basic logic. Good information comes from someone who is interested in providing facts, not someone who wants to convince you that he is smarter than everyone else.

5. Agenda. What is the nature of the site (commercial, governmental, academic, not-for-profit, personal, etc.)? Information on a commercial site is not necessarily wrong; it is just more likely to be biased. [Every site has an agenda](#).
6. References. A legitimate article will have plenty of references and verifiable sources, either as links or footnotes. Always check to see that those sources are legitimate, up to date, and have not been retracted.
7. Tone. If the tone is one-sided, exaggerated, or if the arguments are overreaching, look for a different site.
8. Existing consensus. If a [scientific consensus](#) exists, it is a good bet to strongly consider what the vast majority of active domain experts agree upon. A [survey](#) was done in 2015 comparing what members of the American Association for the Advancement of Science (AAAS) think against what the public thinks, and the [difference is quite eye-opening](#).
9. Verification. Try to independently verify all the key pieces of information. You'd be surprised at how often qualifications are faked and studies are twisted to fit a narrative.

### *Overcoming Confirmation Bias*

There is one more hurdle to overcome, which is [confirmation bias](#). Confirmation bias is the tendency to search for information that confirms one's preexisting belief, and nobody is immune to it. For example, you are far more likely to turn to a conservative channel if you lean right, and have mostly liberal books on your shelf if you are politically left. Why is that? It is because deep down we all want to be right, and confirmation bias acts as the unconscious filter that only lets through what supports our narrative. We hear what we want to hear by presupposing that others share our belief or desires.

How do we overcome this bias? The key is to *actively seek out* a different viewpoint, and evaluate it solely on their arguments. Sounds easy, but it is difficult in practice. Consciously seeking out disconfirming evidence messes with the story in our head, which is mentally uncomfortable. Don't believe me? Try it out yourself. Choose a topic you're passionate about (politics, religion, literature, social issues, etc.), and force yourself to suspend judgment and read an intelligent article on the opposite side of the spectrum.

### *About the Wei Case*

If we apply our skeptical eye to the "80-90% effective" DC-CIK therapy that Wei underwent, we will quickly find that it is preliminary, experimental, and the results are [far less impressive](#). Curiously, DC-CIK therapy is almost [exclusively performed in China](#) – in fact, all 71 [studies listed](#) on PubMed have Chinese authors. How many of those studies apply to synovial sarcoma? Exactly zero. Yes, that loud ringing you just heard would be warning bells going off.

### *Conclusion*

We all freak out when faced with a life threatening disease such as cancer. Without a good option, we tend to reach for any straw that is rumored to float. More often than not, that straw is made of lead. Wei's case shows how important it is to protect ourselves by exercising due diligence, especially when the stakes are high. It is sad that we live in a world where trusted physicians, the people most qualified to guide, sometimes exploit the most vulnerable in their care. We cannot make the world a better place overnight, but at least we can protect ourselves by being skeptical.

## References

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