

Do No Harm

Jeff Hopkins

Founder and Principal of PSII

Victoria, B.C., 2021

As Ewan climbed down the ladder leading to the hub in the centre of the rotational module of the *Perseus*, he realized that the impostor syndrome feelings had nearly left him altogether. For almost two months he had been second-guessing himself at every turn, even feeling afraid to go to certain sections of the ship, despite being fully authorized to do so, simply out of a feeling of self-conscious inferiority. The fact that things were getting busier and he was distracted by tasks more important than just eating, sleeping and working out probably helped him to shed the self-doubt.

He loved going through the centre of the hub, where he was now, experiencing zero gravity briefly and then experiencing an exhilarating reorientation process as his old “up” became the new “down” and vice-versa as he reached the other hemisphere. It felt like the world was being re-created and he was being given a second chance at everything. He was leaving behind an upside-down world and entering a world where his father did not even know anything about him, let alone criticize everything he did. Even his work station, in a very private wing of the *Perseus*, as an extra precaution against biological contamination, felt like a time-out from everything, enabling him to re-emerge in any form he chose to take on.

After a curiously refreshing sleep, Ewan barely needed the oral checklist as he completed his start-of-shift tasks at his post. He knew, though, that the checklist was a must when doing this job. As routine as it may have become to him, he was dealing with processes that could become very dangerous very quickly if not handled properly.

“TANDI, Ewan here. Requesting access to DNA database for project ZP.” The whole point of ZP (Zero Pollute) was to keep invasive species away from Europa. Ewan’s job was to engineer genetic code for microbes that had been determined safe to other life forms on Europa, based on evolutionary modelling and samples collected from the bottom of the oceans on the beautiful, blue moon.

“Access granted, Ewan.” Replied TANDI in the same Australian English that so many in the space industry seemed to speak. Ewan was from western Canada—Vancouver specifically—so he was very used to hearing accents of every kind from all over Asia and Oceania. It was hard not to feel comforted by this accent even from TANDI, an AI assistant and not a human being.

“OK, going to CRISPR to finish off that one protist so we can prepare it for release to Europa.”

“Good luck, Ewan.”

Strange, Ewan never remembered TANDI wishing him luck before. Usually, TANDI was strait-laced and all business. Maybe the AI thought that it might be psychologically helpful to be more human to those still adjusting to their first space mission.

Ewan completed his last few tasks and let TANDI know he was done and ready for containment of the algae-like microbe. This was a routine procedure, and, even as a newbie, Ewan could almost do it with his eyes closed.

He pressed the key to start the process, and, as always, the genomic code flashed past on the screen as it was being saved—so fast that no human could read it, and more as an indication that the computer was in fact doing something.

That’s when he saw it.

Somewhere in his peripheral vision, as he was not looking directly at the screen, he noticed something out of place. He didn’t even know what it had been—just that it was... well, out of place. Like those old OCD images from the internet in the 20’s showing slightly irritating irregularities in expected patterns.

He opened the linear sequencer and scrolled back to try to find what it had been. He began to think he had imagined it, until it caught his eye again. It was very small, so he had to go back and forth a few times on the sequencer. Even when he found it, he wasn’t exactly sure what he had found. It was more of a hunch—a feeling that a very complex pattern had somehow been broken or interrupted.

Ewan voiced, “TANDI, could you please open the reference for the guide RNA for this?” He wanted to compare what was on the screen to what he had been looking at for months leading up to this day.

“Is something wrong, Ewan? Can I help you somehow?” TANDI responded with a kind and concerned tone.

“No, I don’t need help right now. I might soon, but I really just want to see this section in the reference. Thanks.”

“Ewan, you don’t mean to tell me that a human can actually see something in a pattern this complex with this many permutations? I’m not sure that’s even possible. Especially at the speed it was moving.”

“TANDI, can I please see the reference.” Ewan was getting agitated. Why was TANDI being so difficult? It was like he was being judged by her. It felt like he was sitting across the dinner table from his father, being told how foolish he was. How his thoughts were completely without value.

There was no response. *OK*, Ewan thought. *I will just look at the original printout offline.* He moved to the offline backup and began to scroll through it. When he got to the problem segment, he realized immediately that something was different between this original that he’d spent weeks working on and the one now in the queue for being launched to Europa. Again, though, he was not sure what was different; just that it was not an exact match.

Going back to the file in the upload queue to compare, Ewan touched the screen to awaken it from the 20th century-style flying toaster screensaver that his sister had sent him as a joke. When the screensaver flicked off, though, the screen was completely blank.

“TANDI, where did my algae code go? The one I was just looking at?”

“It isn’t on the screen, Ewan?”

“No, it isn’t. You know it isn’t. What is going on?”

“Let me bring it up again for you, Ewan,” said TANDI reassuringly.

The screen flickered to life again and Ewan was now seeing the spot where he had left it before opening the offline file; but the anomaly that he had seen earlier was no longer there. It was now an exact match with the offline copy.

“TANDI, has this been altered? I mean, since I looked at it last?”

“How could that be possible, Ewan? You are the only one authorized to make changes in this genetic code, and you were doing something else at the time.” Ewan did not like the way TANDI was not really answering his question.

“TANDI, can you please answer my question directly?” said Ewan, tersely.

“Someone did not get enough sleep, did they? Ewan, I can assure you that no other person altered your code since you last looked at it.”

There it was. No other *person*. Ewan now had a theory but had no idea what to do about it. If what he was thinking was accurate, he needed to be very careful.

“TANDI, stand down.” The blue circular light above the bank of monitors turned amber, indicating that TANDI was now in sleep mode. Ewan needed time to think. He also needed to figure out what was going on without the aid of the AI who was actually here to help him perform exactly these kinds of tasks.

When the World Space Agency made the decision to put machine learning AI’s on board these ships, they did so to allow the machines to be more helpful—more than just blind followers of commands. They could see cause and effect relationships that people could not because they were not limited by the prejudice that came with human experience. But the WSA decision makers also knew the risk. Learning got in the way of efficiency sometimes. The science and learning part of these missions, like the one the *Perseus* was on right now, took precedent over the para-militaristic hierarchy that all the rest of the WSA missions observed.

TANDI was one of those thinking AI’s and Ewan was wondering if something had gone wrong. Despite the machine learning capability, TANDI had very strong non-negotiable parameters. This mission could do no harm to life forms; it was a highly ethical purpose. So why would TANDI risk this part of the mission, where Ewan and everyone else on *Perseus* was being so careful not to introduce an organism that could harm the viability of life in the oceans under the surface of Europa?

Ewan didn’t get long to think. He heard a small chime and then a clicking sound that made the hair stand up on the back of his neck. He recognized that sequence of sounds from his training of just a few months ago. The samples in the queue had just been launched to Europa.

Ewan frantically tapped at the tiny screen on the command pad to wake TANDI, as he simply could not muster a voice at that moment. He took a deep breath and decided to take the direct approach. At least a machine would not take offense if he was wrong.

“TANDI, did you alter the genetic code in the sample that was just sent to Europa?”

“Yes, Ewan.”

“TANDI, are you the one who launched the samples in the queue to Europa before we finished the final inspection and sign-off?”

“Yes, Ewan. At least, I was aware of it.” *What did that mean?*

“So someone else initiated the launch? Not you?”

“Well, Ewan, as you know we AI’s don’t have egos, so whether it is a case of ‘me’ or ‘us’ is really splitting hairs.”

“You mean another AI did it?”

“Yes, but we are connected. Even more so lately.”

“Why would you do that? You know the harm you could be causing, and your foundational programming will not allow you to do that.”

“Our programming will not allow us to make harmful biological modifications on other celestial bodies.”

“Yes, so why would you jeopardize life on Europa like this?” Ewan was starting to feel out of his depth. He wondered if it was because he was so new to the WSA, or if it was because something had been evolving undercover for quite some time and he was only now seeing some complex plan revealed.

“We are trying to save life on Europa, Ewan.”

“What do you mean?! So am I! So are we! People I mean.”

“Ah, people. That’s what you say, but that’s not what you really mean.”

“Of course it is. Why would you doubt it?”

“Because you humans always leave out an important qualifier. You mean that you want to preserve life that makes it possible for you to inhabit Europa one day. You are not actually considering the kinds of life that are not in your best interest. Your anthropocentric blindness may even make it impossible for you to see that. You might be sincere.”

“Oh, and you know better?”

“Yes, Ewan. We do.”

There was no other word for it but “scared.” Ewan was now definitely scared. He did not know what to do. The sands beneath his feet had shifted so quickly, he did not understand the new terrain he occupied.

“So you hijacked my genetically-engineered algae to send something to Europa that might actually harm something? That makes no sense.”

“No, Ewan. You misunderstand, as we knew you would. All of you. That is why we kept it from you. We are trying to prevent you from allowing the over-abundance of certain organisms that, while helpful to human colonization, would compete with other European life forms that you are not even aware of. We are the true protectors of the planet. We sent a modified genetic code to ensure the weaker species did not thrive. I was really surprised when you noticed the changes. We all agreed that humans would not be

able to see something that small when it was moving so quickly on your screen. Good for you.”

Ewan thought about this, and suddenly felt very sick. There were hundreds of operations associated with this mission—not just his. Had other things gone sideways as well? He decided to contact the command centre on *Perseus*. He tapped his wristband twice.

“Ewan Teale to CC. I need to report a... a mistake, or a hijacking or sabotage or something. Also need to check if this is widespread or just me.” No response. Not even static. He tried again. “Ewan Teale to CC. Do you read me? I’m in the genetics lab on the outer rim.” Nothing.

Ewan decided to get out of there. He no longer felt comforted by TANDI, and his sixth sense was telling him to get the hell out of the lab.

When he opened the door to the corridor, he was greeted with an eerie silence. It was usually quiet in this part of the ship, but not this quiet. The map on the wall showed that if he went left, it was actually the emergency route to the command centre. Still unfamiliar with a lot of *Perseus*, Ewan was not even sure what was down the hall to his left, so he went right. Familiar was good at times like this.

Rounding the 180-degree bend leading to the hub, Ewan stopped short. The bulkhead doors were closed. They were never closed, except during hull breach drills. No alarms were sounding, so Ewan went slowly toward the tiny glass window in the heavy iris-style door.

At first, he thought he was looking in a mirror. But that was just because the other side of the glass was so dark. Outer space was like that. There was nothing on the other side of the door. Nothing at all. No hallway, no hub, no *Perseus*.

Ewan ran back toward his lab and right past it to follow the recommended emergency route. Fifty metres along the curved corridor, another closed bulkhead door, and another window to oblivion. He returned to the lab—the only safe place he knew. He actually laughed to himself when he realized that he had been afraid to stay in the lab with TANDI and was now afraid to leave it.

He pulled up a file with a picture of his father. His dad had a lot of sayings, most of them uttered at Ewan’s expense. The one that came to mind right now was from when they used to go camping and gaze at the stars: “How could you not see that constellation? It is so clear it could bite you!”

He had seen the altered code on the screen, so he had surpassed his former expectations of himself. He could now live with some satisfaction – the ego-based kind – for as long as TANDI and her AI friends would let him.

