

# Why Every Tinnitus Patient Should Be Happy Emirates Team New Zealand Won The America's Cup?

By Dirk De Ridder

I had the unique privilege to accompany Matteo de Nora, the founder of the Tinnitus Research Initiative, our TRI, in accompanying him on a chase boat for some of Emirates Team New Zealand's races in the America's Cup. And while I was thrilled by the sailing, or should I rather say flying, of these vessels, I quickly realized that Emirates Team New Zealand was destined to win, and that this was very good news for the tinnitus community, for multiple reasons.

First, a little explanation. The America's Cup, affectionally known as the Auld Mug, is the oldest international sporting trophy, dating back to 1851. It is the Formula 1 of sailing, held every 3-4 years, and this time in Auckland, New Zealand, because Emirates Team New Zealand won the previous edition in 2017. And, the winner dictates the rules and the design of the boats for the next challenge.

New Zealand is a very beautiful, tiny country, still covid-free, with 5 million people, very remote, more than 4000 km further than Australia (in a Eurocentric vision). It is known for Lord of the Rings, the Rainbow warrior bombing, its popular prime minister, multiculturalism (Maori and Pacific Islanders, European and Asian), gender equality, the kiwi, its stunning landscapes and sports, especially rugby with its famous All Blacks, and...sailing. Pro capita, New Zealand is one of the most successful Olympic medalist winners.

But why is it important that Emirates Team New Zealand won? Well it is for multiple reasons.

A first reason, of course, is that the founder of the TRI is one of the two driving forces of this remarkable team, and so we, as TRI are proud that he and his team won.

A second reason is that I live in New Zealand, love its people, its commonsense no-nonsense approach and want my new country to win.

But most importantly, because it provides hope for people living with tinnitus, and I will explain what went through my head while I was in one of the chase boats with Matteo de Nora.

What first blew my mind was the exceptional design of these boats. They do not sit in the water, they hardly touch the water, they seem to fly over the water, only in contact with the water by 2 hydrofoils. These are not sailboats but flyboats.



And even more amazing, these sailboats can sail/fly 3 to 4 times faster than the speed of the wind. To me, this looked like magic, something what appears impossible, yet, can be achieved by the right engineering, and not accepting it is impossible, as long as it falls within the laws of physics and biology. Yet, it requires way more than just concocting a sailboat. It requires an extraordinary amount of highly dedicated unrelentless professionalism, rarely seen outside this team, with Grant Dalton taking care of the sailing/flying and Matteo de Nora of the organization, management, politics, and finances. The two form an incredible tandem. According to Wikipedia, the America's Cup "is a test not only of sailing skill and boat and sail design, but also of fundraising and management skills. Competing for the cup is expensive, with modern teams spending more than \$US100 million each; the 2013 winner was estimated to have spent \$US300 million on the competition". And Emirates Team New Zealand is probable the team with the lowest budget. Why is this relevant?

Because it shows that by being creative even a more restricted budget than the almost unlimited USA and UK budgets does not prevent success. And this is where the tinnitus research world can learn from sailing.

So, what can we learn? That success is all about creativity, innovation, team building, dedication, preparation, and professionalism. The fact that a tiny country with a more restricted, albeit still huge budget in most people's counting, can win against very wealthy competitors with almost unlimited budgets and a selection of an almost unlimited amount of professional sailors sets the example for tinnitus research. Like Emirates Team New Zealand, tinnitus research is a small community with very limited budgets. But Emirates Team New Zealand proves this is no excuse not to be successful. So, what should we do? Well, we should look at what brought this success about and mimic the story of Emirates Team New Zealand.

What did Emirates Team New Zealand do to win? What is the magic sauce, the secret, the ingredients of success?

It starts with a motto I saw on one of the sponsors, Toyota, an unlikely motto for a Japanese company: "In crazy we believe".



The kiwis, as New Zealanders are called, and call themselves, still embrace risks and are creative and innovative by necessity. They are willing to take chances as a matter of habit, but the risks are

calculated, originally based on experience, now aided by artificial intelligence. The kiwis were the first to imagine a catamaran as a foiling yacht. They were the first to put cyclists on a boat. And they proposed a single hull foil sailboat for the 2021 America's cup. This is what the tinnitus field also has to do: embrace crazy ideas, be open-minded to novelty and go for it.

So, how did Emirates Team New Zealand do that?

The sailboats used in this edition of the America's Cup are actually more akin to airplanes than sailboats. The way these boats fly is based on the same physics that make airplanes fly. Thus, the kiwis realized they needed help from aircraft engineers who design airplane wings, and thus, many young talented aerospace engineers were attracted to help design this boat. But the boat should not take off and leave water, a similar problem encountered by F1 cars. So, Emirates Team New Zealand attracted F1 engineers to help design the boat. Yet, going on uncharted territory comes with a huge amount of new information, and it is critically important to separate signal from noise, to retain valuable information and discard uninteresting data. And that is where artificial intelligence comes in, to help discern relevant patterns in all the new information and use that to perfect the boat. So, a whole new breed of AI people were attracted to help design and perfect the boat. And, oh yes, also some boat designers are needed of course, even if only to design the sails. And as you may guess by now, the sails also are unique. They are double sails, with space between the two leaves, as AI shows this further provides extra speed.

All of this is well, but how do you make this work, specialists from very different domains, all working together? Well, you first need a common language, a 'company culture' as marketeers tend to call this. And what is this culture? I think it can be summarized by 1 sentence:

**"In science we trust, in crazy we believe".**

So maybe that should become the philosophy of tinnitus research, promoted and advocated by the TRI, which was founded by the same person who is co-responsible for Emirates Team New Zealand's exceptional success story.

On the way back home I thought about what Matteo de Nora told me on the chase boat, that he was frustrated he had not been able to create a similar 'winning' team within the tinnitus community, when he started funding the TRI. His vision was to do the same thing for tinnitus as what he has done for sailing. And he is right, we haven't found a solution for tinnitus at all, even though his contribution has made a landslide of difference, by generating a minimum level of basic knowledge about tinnitus, and by permitting international collaborations, but nothing in comparison to Emirates team New Zealand.

And there are multiple reasons for that. One reason is that when Matteo de Nora founded and started funding the TRI the first component of the motto "In science we trust, in crazy we believe" was completely absent. There was simply no data about tinnitus, so we didn't even know who to put into the team. Consequently, we embraced everybody, creating a very multidisciplinary group, involving psychologists, audiologists, neurologists, ENTs, neurosurgeons, basic scientists, information scientists etc. This was wonderful, but it came with an equal amount of different agenda's, different research cultures, individualists afraid of sharing their knowledge, and not, in contrast to the America's Cup, a single concerted and pragmatic approach that requires delivery at a defined

moment. Furthermore, there is also the geographic distance, and research has shown that physical proximity is still important for successful collaborations, even in this time of digital connectedness.

But just 'imagine', that one would organize a tinnitus research team based on the principles of Emirates Team New Zealand. Would that also be an equally successful team? Well, it is all about having all the right people, at the right time, in the right place. And the best team members are not always the smartest, they have to be team players. An individualist who is only interested in his/her own fame and glory cannot fit in a team approach, irrespective of how smart or intelligent he/she is. An Olympic sailing medalist who wanted to be part of Emirates Team New Zealand was kindly asked to leave the team, as he was not a team player. But you cannot be a specialist in everything, and if we want to solve the problem of tinnitus we need to use the team approach, the Emirates Team New Zealand approach, but with a vision set out by only 1 or 2 people, one single vision, not 10 different ones, all going in different directions. And this is what happened in the early years of tinnitus research. And that is good in the beginning, when nothing is known, just like the early explorers of unknown continents, who seem to wander around randomly exploring the unknown. But once the area is charted, a systematic concerted approach is required. And we are still exploring in the tinnitus field, but are at a transition time, when a new approach, an Emirates Team New Zealand approach is needed to bring together what is known into one concerted goal oriented approach, by a highly dedicated team of creative, innovative specialists who accept to work as a team, to crack the enigmatic code of tinnitus, not for their own fame and glory, but the benefit of the patients and the joy of winning, to understand how the brain and body works.

Even with such an approach, solving the tinnitus problem is not guaranteed, just like you cannot guarantee that Emirates Team New Zealand will certainly win, but the likelihood is tremendously bigger. Analogous to sailing and other sports you need a little luck, but luck can be helped. For example, using artificial intelligence to extract the what the wind and currents are like in the area of the races during the last 10 years may help to select the size of the foils. Large foils may be beneficial in low winds, but increase the resistance in the water, so may slow the boat down a little. Small foils have less resistance, and thus can go faster, but cannot lift the boat out of the water when winds are low, so are a little more risky. This focused goal oriented extremely professional approach incorporating calculated risks, is still missing in tinnitus research. We need to consider to really collaborate, in the same way Emirates Team New Zealand does.

How then?

Let me give you an example how understanding sailing success can be translated to tinnitus research, with neuromodulation as a treatment approach. The basic philosophy is that tinnitus is a phantom sound, characterized by loudness, location, tonality, thoughts, emotions, mood, stress and other aspects, all integrated in one unified percept for the patient. All the characteristics are likely emergent properties of different, interacting, partially overlapping dynamic networks. Furthermore, the brain communicates with neurotransmitters to the endocrine system and the immune system, and the immune system talks to the brain and endocrine system by cytokines, and the endocrine system communicates with the brain via hormones. But how these systems interact is also determined by one's genetic makeup. In other words, we have to accept that trying to find a solution limited to the brain may be insufficient, just like Emirates Team New Zealand had to go beyond building a sailboat with only boatbuilders.

if that is the case, we not only need people specialized in recognizing and extracting patterns of brain activity such as artificial intelligence specialists. We also need geneticists, and people specialized in neuroinflammation, which may be crucially involved in the transition from acute to chronic tinnitus. We need endocrinologists (hormone specialists), as indeed some postmenopausal tinnitus can be improved by hormone replacement therapy, and testosterone has anti-inflammatory effects. What we can learn from Emirates Team New Zealand is to think further, be creative, have a bold vision, and act accordingly. We need to design innovative brain stimulators that can treat not only 1 area at the time, like we do now, but simultaneously modulate all the involved networks. And this is not impossible. The stimulators exist, but need to be adapted to target tinnitus networks. And we need specialists in advanced functional imaging, so that we can understand how these networks are modified by these novel neuromodulation techniques. These advanced techniques go beyond what we routinely analyse, and may need to incorporate entropy measures to look at information, dynamic measures, to look at information transmission, to develop new measures, like aligning brain activity in time etc.

What is needed, is of course funding, not for one year, but for 4 to 10 years, and one single location, or even better 2 or 3 locations who compete to find a solution that can silence tinnitus, not only help people to learn and live with the sound. We need an America's Cup for tinnitus research. That requires funding of course, but also a tinnitus tower, a single place where all these specialists collaborate, developing products that can be tested, fail, tested again, based on specialist insight and artificial intelligence support.

And is all of this impossible? It is only as impossible as admitting it is, just like I thought sailboats could not go faster than the wind. It takes some craziness to be successful, but craziness is not enough. It requires organized, structured craziness. It requires a highly professional, extremely dedicated, hardworking team of complementary specialists to solve the tinnitus problem. But with the right funding, this Emirates Team New Zealand has shown that what seems impossible can be done.

So, every tinnitus patient should be happy Emirates Team New Zealand won the America's Cup, as it shows the path forward.

Just 'imagine' that F1 sponsors, America's Cup sponsors set up a competition, to be held every 4 years, in which the most successful new treatments are tested and compared against each other. Then I want to be a member of the Emirates Team New Zealand Tinnitus team, maybe not the wealthiest, but the most creative, innovative, daring, dedicated, well organized team, a low key team, without arrogance, but all dedicated to win the ultimate trophy: silence tinnitus.

From a personal point of view, I would like to thank Matteo de Nora for the wonderful time in Auckland, for his extraordinary generosity and for sharing the Emirates Team New Zealand spirit with me. I have learned a lot about 'winning', and I am convinced that the same approach can be used for tinnitus, pain or other pathologies. But above all, I thank him for believing in me, before anyone else did.

"In science we trust, in crazy we believe"



Figure: Matteo de Nora (left) and Dirk De Ridder (right) on a chase boat in front of Emirates Team New Zealand's flyboat