



The Young Darwinian™

## Star trek science comes alive

By

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As the Starship Enterprise power surged to warp power and set off to where 'no man had been before', in the sick bay, with Mr Spock looking on, Dr 'Bones' McCoy diagnosed and treated the near fatally wounded Captain Kirk with his trusty hand held Tricorder.

23<sup>rd</sup> century science fiction, but the writers in the 1960's were imaginative, visionary and prophetic<sup>1</sup>. Take the Star trek communicator for example. This was a great idea, but actually not as good as my smart phone. The computer was powerful, yet did not connect to an 'internet', this was too far fetched. The power source for the warp drive involved mixing matter and anti matter, (frozen anti hydrogen,) and dilithium crystals. The antimatter has in fact been made, albeit in microscopic amounts, unfortunately dilithium hasn't been discovered yet. The 'ion drive impulse engines' have materialised as 'Hall Thrusters', which can propel rockets within our solar system. The engineered androids and the deflector shield no longer seem impossible. I await with much anticipation the invention of the warp travel and the transporter (Beam me up Scotty). And the tricorder, how has this progressed in the last forty years?

The original 23<sup>rd</sup> century Tricorder<sup>2</sup>, short for Tri-functional recorder, was able to visualise inside solid objects, make amazing medical diagnoses and even treat life-threatening wounds. Today we routinely use imaging inside the human body based on Nuclear Magnetic Resonance with excellent resolution, undreamt of just 40 years ago. But another discovery, being developed at Imperial College London, is still hard to fathom. There the scientists are diagnosing people with oesophageal and stomach cancer, just by analysing their breath<sup>3</sup>. Similar methodology is being developed to detect if someone has TB infection in the lung. They are doing this by measuring the amount of certain small organic acids and molecules: Butyric, pentanoic and hexanoic acids, butanal and decanal. The technique is called selected ion flow-tube mass spectrometry (SIFT-MS), and the pattern of results in a breath sample can be related to the cancer or infection.

*Curiosity inspires, discovery reveals*

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Now that will be an amazing advance if it is developed and gets into medical practice. Captain Kirk and Dr McCoy would be proud!!

Breath testing is routine for measuring hydrogen to diagnose lactose intolerance<sup>4</sup>. (see the project )It is also used a road side test for alcohol on the breath of a drink driver.

Imagine my delight when I came across a real life, real time Tricorder project, inspired by the Star Trek vision. The X Prize Foundation, sponsored by Qualcomm, is offering ten million US dollars in prize money, (7 million first prize, 2 million second and one million third prize) to come up with a 21<sup>st</sup> century Tricorder<sup>5</sup>. This must be non invasive, portable, weigh less than 2.3kg, and be able to diagnose over 12 medical conditions including HIV, whooping cough, high blood pressure, glandular fever, shingles, melanoma and osteoporosis. Wow!!!

Ten companies have been shortlisted. The research going into this is immense. This is so motivational for these companies and even if they don't win will have valuable research and equipment. The power of this inducement prize competition is huge.

The results will be announced early in 2017. Watch this space.

1. [https://www.nasa.gov/topics/technology/features/star\\_trek.html](https://www.nasa.gov/topics/technology/features/star_trek.html)
2. <https://en.wikipedia.org/wiki/Tricorder>
3. [https://www.eurekalert.org/pub\\_releases/2017-01/eeco-btc012717.php](https://www.eurekalert.org/pub_releases/2017-01/eeco-btc012717.php)
4. our breath testing paper
5. [https://en.wikipedia.org/wiki/Tricorder\\_X\\_Prize](https://en.wikipedia.org/wiki/Tricorder_X_Prize)



Stephanie is a medical biochemist with a specialist expertise in cholesterol and heart disease, and food intolerance, pioneering LDL apheresis for people with severe cholesterol problems. In 1993, she helped Anthony form the Darwin Centre ([www.darwincentre.com](http://www.darwincentre.com)). She is an expert in mentoring projects for school students. She is a Fellow of the Royal College of Pathologists, and was short listed for Hospital Doctor of the year in 2003.

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