



# FOR WHOM THE BELL TOLLS

The basic principles of Molecular Imaging & Theragnostics – by George Bennie

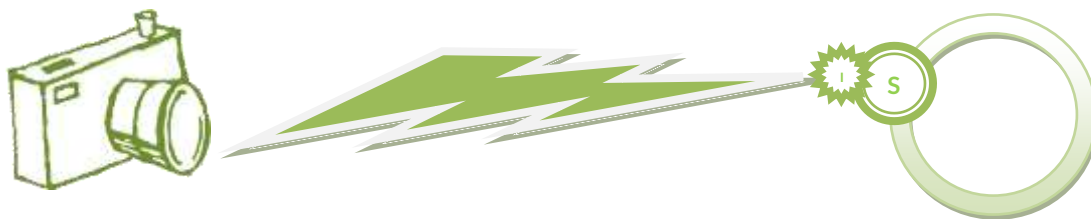
Every drug or medicine, by virtue of its chemical properties will attach itself to some or other target in the body – whether that target is a cancer cell, infection cell or heart cell et cetera.



Wouldn't it be lovely if every such drug or medicine (called the 'substrate') had a little "bell" or "light beacon" attached to it that rings or shines up every time the drug attaches itself to the target so that we could easily locate it?



In nuclear medicine we have such little "bells" in the form of radioactive particles called "isotopes" that emits a beam of energy that can be detected by a special camera and used to image the body from internally. These cameras can be either a gamma camera or a PET camera (simply designed to each detect a different type of beam).



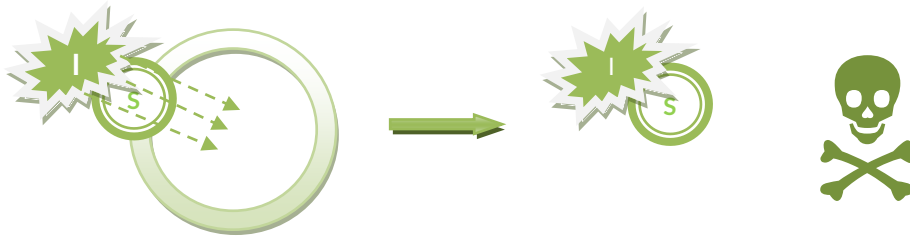
Up until now, the "bell" or isotope has allowed us to mostly only *image* a target e.g. cancer, or infection or other cells.

By replacing that bell with a with a canon, it would allow us to destroy that target once it has found it, a lot like an armed paratrooper infiltrating enemy lines.





This is exactly what has happened in nuclear medicine: We have replaced that small and fairly harmless bell with a stronger isotope that emits a different kind of beam and can subsequently be used to either injure or destroy the target – and it does this without causing damage to the remaining normal tissue in the body or to a very limited extent – thus having very few of those nasty side-effects.



All that changes in each case is the target disease or cancer type, the specific substrate designed to latch onto that cancer and the specific isotope depending on whether we want to detect or treat the cancer. All these components are the arsenal of a Nuclear Physician or Molecular Medicine Specialist.

While conventional treatments have proven formidable and withstood the test of time, Theragnostics (imaging *and* treatment of a cancer with the same substrate but different isotopes) has instantly given the world access to individually-tailored therapies in especially cancers and conditions that were previously thought to be untreatable and frankly a death sentence.

*So perhaps the bell needn't toll for the thousands of destitute patients anymore – we now have the capability of treating even the untreatable.*