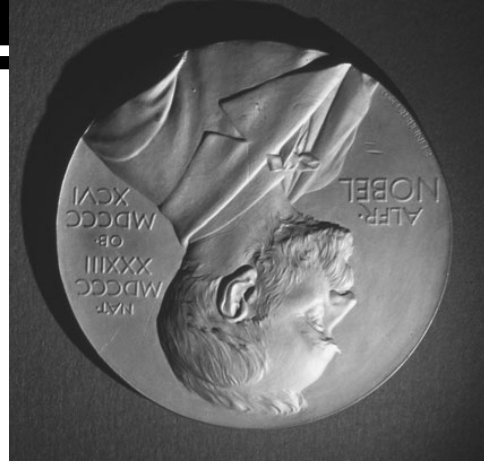


THIS YEAR'S NOBEL PRIZE IN MEDICINE



Visual proof that this shameful wrong must be righted

No signal, no image. No signal differences, blank image.

In our effort to right the shameful wrong that has been done to Raymond Damadian, M. D., by this year's Nobel Prize Committee for Physiology or Medicine, we now share with you, in historic photographs, the "exciting discovery" that "opened the door for a complete new way of imaging the human body"¹ and the subsequent technical improvements that have led to today's MRI.

These photographs and other materials are an arguable testimony to the truth of discovery. The only violation of the truth — and to Alfred Nobel's requirement to reward only "discovery" in medicine² — resides in Stockholm, where unacceptable manipulations allowed this shameful wrong to be perpetrated and where those responsible are prepared to celebrate both wrongs on the evening of December 10th.

THE LANDMARK DISCOVERY THAT REVOLUTIONIZED MEDICAL IMAGING

The signal we've illustrated in Picture A is the 1970 discovery that "opened the door for a complete new way of imaging the human body.... NMR [the former name of MRI] developed into a laboratory spectroscopic technique capable of examining the molecular structure of compounds, until Damadian's ground-breaking discovery in 1971.³ The exciting discovery that the signal from cancer tissue is much stronger⁴ (long T1 and T2 relaxations) than the signal from normal tissue prompted Dr. Damadian to propose the first MR body scanner.

To make it a reality, he invented the first method ever for achieving an MR scan of the body. His method provided the necessary 3-dimensional technique. This method was reported in the *Downstate Reporter*, Spring 1971, and was recorded in his 1972 patent.

Paul Lauterbur, one of this year's Nobel Prize winners in medicine, did not attempt to improve Damadian's method until the fall of 1971. He proposed the application of the magnetic gradient of Gabillard, Carr, and Purcell, but his initial effort simply replicated the 1-dimensional technique they had demonstrated in the 1950's.

The first ever scan of a live human being was achieved by Damadian, using the method of his patent (see historic image below).

NO SIGNAL DIFFERENCES, BLANK IMAGE

The MRI image is only there because of the signal differences in tissues that Dr. Damadian discovered. The marked difference of the two signals supplied the contrast needed to see cancer. This difference had been lacking in X-ray pictures for almost a century and badly hampered the ability of medicine to detect serious disease within the body.

DAMADIAN'S LANDMARK WORK WITH NORMAL TISSUES

When Dr. Damadian was measuring the strength of the cancer signal, he had to measure the strength of the NMR signals from a variety of normal tissues. This was necessary so he could compare the signals from normal tissue of the same type as the cancer tissue. During the process, he measured the NMR signal differences from a full range of normal tissues, including muscle, liver, stomach, small intestine, kidney and brain.

Although a number of random measurements had previously been made on isolated normal tissues, he was the first to measure a full spectrum of normal tissues under identical conditions — using the same magnetic field strength, same animals, and same NMR method — thereby making a direct comparison of their signal strengths possible. He tabulated them in his *Science* paper. He discovered that the signal strength differences among the healthy tissues were also enormous — a range of 132%, compared with X-ray's maximum variation of 4%. For example, a difference of 257 milliseconds for the small intestine and 595 milliseconds for the brain.

No wonder Dr. Freeman Cope, an NMR collaborator of Dr. Damadian's on other NMR studies, told Dr. Damadian, "Your cancer paper contains a second discovery. No one has ever reported a comparison study of the healthy tissues. There are major differences here as well."

The dramatic differences in signal strength among healthy tissues create the dramatic differences in pixel brightness that enable modern MRI machines to provide exquisite detail of the internal anatomy, such as the detailed structure of the brain.

WHAT THE TWO WINNERS CONTRIBUTED

The two winners the Nobel Committee for Physiology or Medicine have chosen to honor for the MRI did nothing more, or less, than contribute improved ways to image the tissue signals that Dr. Damadian discovered.

It was, however, only after the two winners — the chemist and NMR specialist Paul Lauterbur, Ph.D., witnessed a repeat of Damadian's landmark experiments and Damadian's experiments were brought to the attention of Peter Mansfield, Ph.D. — that they began to think about the possible applications of magnetic resonance to medicine.

THE MRI'S UNPRECEDENTED ABILITY TO DETECT DISEASE

For nearly 100 years, the detection of disease within the soft tissue of the human body was limited by the X-rays inability to see soft tissue clearly. It could distinguish it with a maximum contrast of only 4%. On the other hand, Damadian's breakthrough discovery

was the extraordinary difference in the contrast between MR signals from cancer tissue and normal tissue. It was as high as 182% — or over forty times greater than the X-ray. Here indeed was an unprecedented new tool for the early detection of disease.

As stated in the new MRI imaging textbook (*MRI From Picture to Proton*, Cambridge University Press, UK, 2003): "This exciting discovery [of Damadian's] opened the door for a complete new way of imaging the human body where the potential contrast between tissues and disease was many times greater than that offered by X-ray technology and ultrasound."

In Damadian's ground-breaking 1971 paper he used the word "detection" many times but he never once used the word diagnosis. Some non-medical people misunderstood why. There is a medical reason. The detection of disease is different from the diagnosis. Detection comes first, diagnosis second. All medical imaging machines are only meant to detect. Diagnosis can only be done with a needle biopsy of the lesion in the image and an examination of it under the microscope — a second step required no matter what kind

put them as pixel brightness represent an "insubstantial difference" from his patented use of the signals to detect cancer. And no wonder President Reagan awarded Damadian The National Medal of Technology for the MRI in 1988 (jointly with Lauterbur). Then in 1989 Raymond Damadian was inducted into The National Inventors Hall of Fame, which was established by the U. S. Patent Office, as the sole inventor of the MRI. (We also find Alfred Nobel in this hallowed hall.)

Without an immediate reconsideration that would include Dr. Damadian in this year's award for medicine, Nobel insiders will have heaped irremediable shame on the prize and, in fact, will render this year's Nobel Prize in Medicine scornfully irrelevant to history, as well as a violation of the will of Alfred Nobel.

AN OUTRIGHT VIOLATION OF ALFRED NOBEL'S WILL

Alfred Nobel was very meticulous in specifying what each award was to be given for.

In medicine he specifies that the prize for the person who "shall have conferred the greatest benefit to mankind" must be limited to "discovery."⁵ He does not allow inventions or improvements, as he does in chemistry and physics. Yet inventions or improvements are the only things this year's Nobel Committee has chosen to honor, while it excluded the only scientist who made the discovery that originated MRI.

WEAK EXCUSES JUST WON'T DO

The shameful wrong of Raymond Damadian's exclusion has yet to be honestly addressed and courageously righted.

One of the leading Nobel spokesmen, to evade the issue pressed on him because of Damadian's long-recognized seminal discovery and other MRI achievements, recently informed the press: "We're only giving the award for the image." Where on earth would the image be without Damadian's signal from tissues? Is this not like honoring the invention of the automobile while excluding the invention of the engine that drives it? Or as an MRI physicist wrote to the Nobel Committee, "It's like honoring the bicycle for transportation while excluding the wheel."

Here is another inexcusable tidbit, sent by two senior officials of the Nobel Committee to a knowledgeable and well-meaning scientist who had written them about this outrage: "You mention that you interpret our rules to mean that November 15 is the date of our yearly Award decision. The answer is that our statutes state that the award decision is to be made no later than October. This means that our yearly deadline is October 31.... You seem to suggest that another person deserves the Prize and that there is an issue. The answer is that our statutes prohibit us to reveal our discussions, evaluations, nominations, and considerations."

Who would call that the high-minded voice of moral humanity defending a valid decision? What we have instead is a persistent refusal to acknowledge the truth and honor it. Alfred Nobel mentions nothing about statutes in his will. More importantly, the "statutes" of Nobel's will itself appear to be of no consequence to the Nobel Committee, since, we note, they alter them whenever they like. So who can take seriously Committee statutes that do not even appear in Nobel's will?

THE ONLY STANDARD IS THE TRUTH

There is only one pedestal on which the Nobel Prize can rest if it is to remain the world's preeminent award for scientific achievement: the pedestal of truth, truth inviolable.

It was Damadian's idea to make the MR body scanner.⁶

And he provided the signal to do it.⁵

And he provided the first-ever scan method to accomplish it.⁶

And the first human image ever by using it.

Willfully exclude him? Can you imagine!

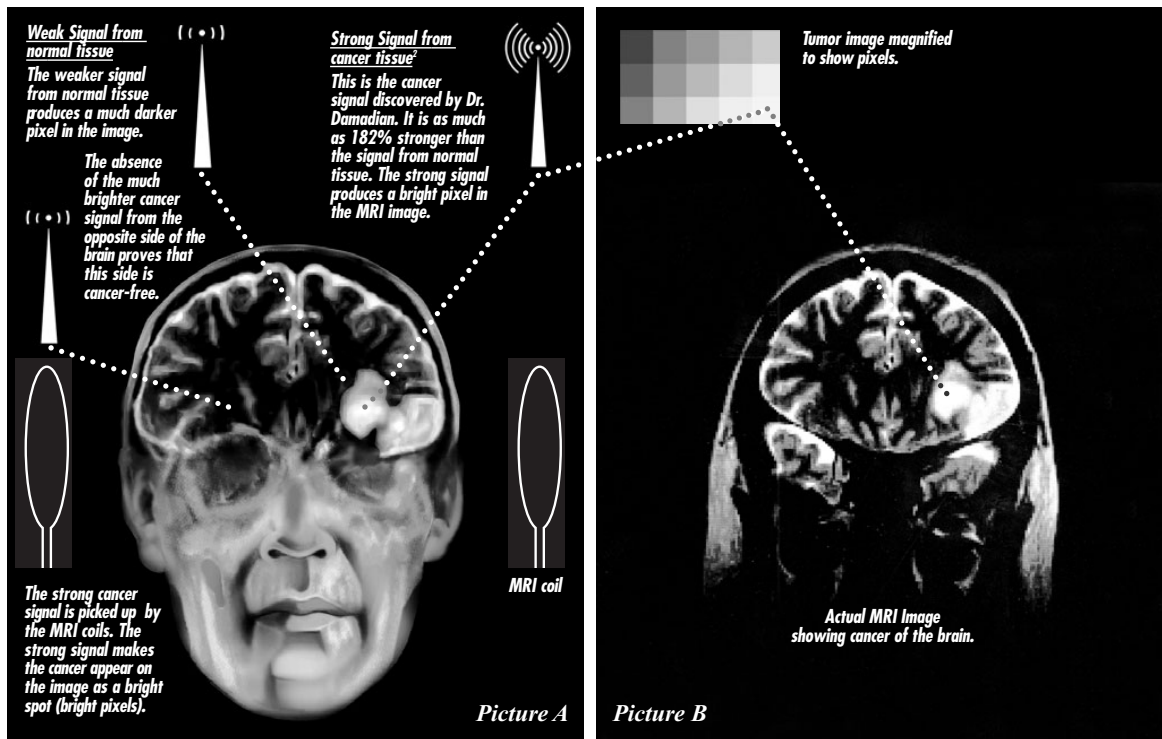
As Alfred Nobel said,
"Lying is the greatest of all sins."⁷

THREE WINNERS CAN BE NAMED

In our effort to right the shameful wrong that has been done to Raymond Damadian, M.D., and, along with it, to the will of Alfred Nobel, we appeal to concerned citizens everywhere to let your voices be heard in protest to this shameful treatment of the man who has been widely regarded as the inventor of the MRI for nearly 30 years and the shameful wrong to the very inventor who established the Nobel Prize.

We ask you now to join the worldwide outcry and insist that this year's Nobel Prize in medicine be based on the truth of scientific discovery and on the will of Alfred Nobel.

Let your voice be heard, now.



Picture A (On Left): The Two Signals Together create bright cancer pixels surrounded by darker normal pixels. The marked signal difference discovered by Dr. Damadian supplied the needed contrast that had been lacking from X-rays of the vital soft tissues for almost a century. These are genuine radio signals put out from the atoms inside the tissues when the body is in a strong magnetic field. They are picked up by the receiving coils of the MRI shown in the illustration.
Picture B (On Right): The bright pixels detecting the tumor are only in the image because of the cancer signal discovered by Dr. Damadian.

of imaging machine is used to detect the disease.

With the observations by others who were following up Damadian's discovery, it was found that most disease tissues also have strong signals. Therefore, Damadian's initial cancer-signal discovery actually opened the door to the early detection of far more diseases than he originally imagined.

TODAY'S MRI MACHINES

The cancer signal discovered by Dr. Damadian is the engine that powered the MRI from the outset and continues to power every MRI machine in use today.

Of the contributions made by the two scientists named for this year's prize in medicine and Raymond Damadian, only Damadian's discovery is still in use on every MRI scanner, every day, throughout the world. The improvements of Damadian's original 3-D scanning technique by both Lauterbur and Mansfield have been replaced worldwide by the spin-warp imaging technique invented in 1980 by the University of Aberdeen group of Hutchison, Edelstein, and Mallard. A subsequent train of other inventors have made many more improvements since then.

Millions of cancers are detected around the world each year because of the Damadian cancer signal. The early detection that this highly sensitive signal allows is saving millions of lives every year, as well as preventing untold agony. It is also sparing millions of patients from unnecessary surgeries, and it is providing more frequent assessments of therapy, so the therapies can be modified to achieve success.

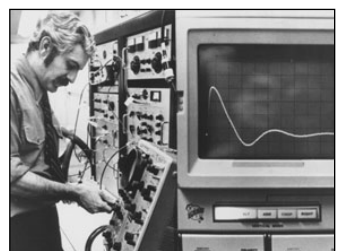
THE COMMITTEE KNEW THE TRUE HISTORY OF MRI

The true history of MRI is copiously documented, and all the documentation was meticulously and repeatedly provided to the Nobel Committee for Physiology or Medicine over the years that the award for the MRI has been under consideration. The scandalous truth is, the NMR clubhouse of Nobel insiders are attempting to rewrite the history of the MRI and write Raymond Damadian, M. D., out of it for the false distinction of their cronies.

The historical evidence is so compelling, no wonder The High Court of U.S. Patents and The U.S. Supreme Court concluded that Damadian's cancer-detecting method and cancer signal are used on all of today's MRI's. Both courts concluded that the way modern MRI's use the signal differences discovered by Dr. Damadian and the way they out-

TIMELINE OF MRI

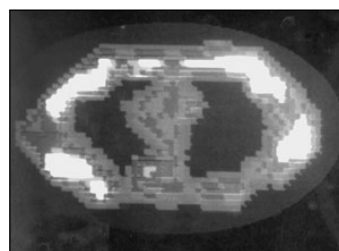
1969 Original Concept Damadian conceives of and proposes a whole-body MR scanner for the first time ever	1970 Key Discovery Makes MRI Possible Damadian identifies the T1 and T2 signal differences (that is, the signal strength differences) between cancer tissue and normal tissue	March 1971 First article published Damadian publishes his first article about his findings in the journal <i>Science</i>	Spring 1971 Scanning Method Proposed Damadian outlines his voxel-by-voxel scanning method, recorded in his 1972 patent. It works.	September 1971 Gradient Method Proposed Lauterbur's notebook proposal to use the gradient methods of Gabillard, Purcell & Carr to scan 1 dimension as Gabillard did. It's incomplete: 3 dimensions are needed.	March 1972 First Patent Filed Damadian files patent for his 3-dimensional voxel-by-voxel scan method (patent issued in 1974)	October 1972 2D Scan (image) Achieved Lauterbur submits a 2-dimensional MR scan (image) method with scan of 1mm tubes	March 1973 2nd Paper Published Lauterbur's second paper (2-D image) is published in <i>Nature</i>	1974 3D Scan Method Proposed Garrowsay, Grannell & Mansfield publish a 3-dimensional scan method	1975 Phase Coding Introduced Kumar, Welli & Ernst introduce phase coding	1977 First Human Scan Achieved Damadian and two of his graduate students, Minkoff and Goldsmith, achieve the first scan (image) of the human body using Damadian's original voxel method. It is a cross-section of Minkoff's chest, completed 4:45 AM, July 3, 1977	1980 Phase Coding Applied Aberdeen group of Hutchison, Edelstein, and Mallard achieves successful spin-warp technique in use throughout the world today to make MRI images	1980 First Commercial MRI Damadian - and the company he forms for the practical application of MRI technology to medicine - introduces the first commercial MRI scanner, utilizing his patented voxel method	1997 Patent Upheld High Court on U. S. Patents and the U. S. Supreme Court enforce Damadian's patent, finding an "insubstantial difference" between how modern MRI's produce an image and his T1 and T2 discoveries.
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Raymond V. Damadian, M.D., at the NMR in his Brooklyn laboratory, measuring the signals from human tissues. It's the same instrument model he used to make the original discovery that "opened the door for a complete new way of imaging the human body..."



Dr. Damadian with his postdoctoral research fellows, L. Minkoff and M. Goldsmith, and the first MR scanner, which the team built by hand at New York's Downstate Medical Center.



The world's first MR scan (image) of the human body, completed on a cross-section of Minkoff's chest by Raymond Damadian, M. D. and his team, utilizing the method of his patent.

In addition to making the original discoveries on which all MRI's are based (T1 and T2 tissue relaxations) and building the world's first MRI by hand, Dr. Damadian also invented the first Open MRI, the first mobile MRI, and now the first Stand-Up™ MRI.

Insist that this shameful wrong be righted, now.
HOW YOU CAN HELP RIGHT THIS SHAMEFUL WRONG
TO: The Nobel Prize Committee for Physiology or Medicine
Dear Members of the Nobel Committee: The TRUTH must have a place. 1/We believe this year's Nobel Prize for Physiology or Medicine should include Dr. Raymond Damadian.

Name _____
Address _____ City _____ State _____ Zip Code _____

Mail to: The Nobel Committee for Physiology or Medicine, Nobel Forum, Box 270 SE – 171
77 Stockholm, Sweden E-Mail to: seccr@mednobel.ki.se
Or call the Committee at 011-46-8-585-823-44 • 011-46-8-662-64-31 • 011-46-8-51-77-45-00

Paid for by The Friends of Raymond Damadian.
Contact DanielCulver@aol.com or call him at 631-694-2929.

1. *MRI From Picture to Proton*, Cambridge University Press, UK, 2003 2. A strong signal and a signal with an elevated relaxation time or prolonged decay rate are identical statements. In the T2 image shown, the relation of signal strength to decay time is given by $S = e \exp -TE/T2$, where S is the signal strength. Note that as the signal decay time increases (T2 increase), the signal strength simultaneously grows (TE held constant). 3. Nobel e-Museum 4. The first time ever in history anyone dared such an idea 5. The cancer-detecting signal that provided the goal worth pursuing such a scanner and the goal worth investing in its construction. 6. Spring, 1971, U.S. Patent #3,789,832 For more documentation, visit www.fonar.com.