



Knowledge Inn (in nature)

 **EscapeCorona**

 **Research Profile of Richard R. Ernst (Nobel Laureate)**

KLab

rsr.chem1979

Escape Corona

Time line of Covid-19 (Pandemic infection)Data

SARS-CoV-2 (Globe)

Up to dd-mm-yy	Infected	Deaths	Recovered
17-06-20	80,35,364	4,36,918	38,72,963
28-06-20	98,91,727	4,96,075	50,04,567
15-07-20	1,32,87,651	5,77,954	53,35,213
18-7-20	1,40,60,402	6,01,820	78,61,823

SARS-CoV-2 (India)

Up to dd-mm-yy	Infected	Deaths	Recovered
15-7-20	9,58,044	24,713	6,05,556
18-7-20	10,40,089	26,285	6,54,078

SARS-CoV-2 (USA)

Up to dd-mm-yy	Infected	Deaths	Recovered
17-06-20	21,77,377	1,18,618	6,79,161
15-07-20	34,83,905	1,38,358	10,26,816
18-07-20	36,77,453	1,40,888	10,76,823

SARS-CoV-2(18-07-20)

Country	Infected	Country	Infected
Brazil	20,64,328	U K	2,94,803
India	10,40,089	Italy	2,43,967
Russia	7,59,203	Spain	2,58,855

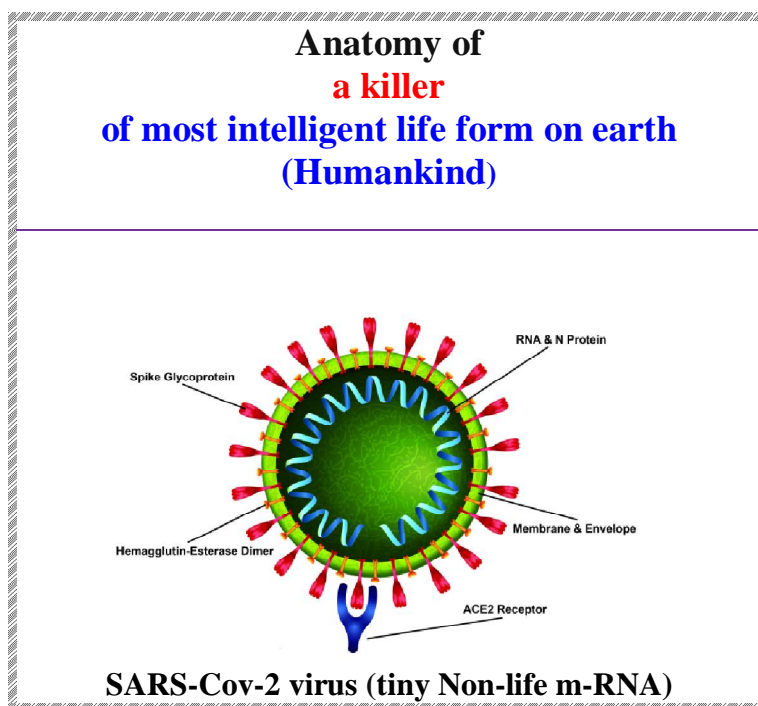
Reference

Title	Evolutionary-scientific-cure[Esc.]:Part 1. Corona virus disease [CVD]
Journal	Journal of Applicable Chemistry, 2020, 9 (3): 344-361
Authors	K. Somasekhara Rao, K. Ramakrishna, Ch. V. Kameswara Rao and R.Sambasiva Rao

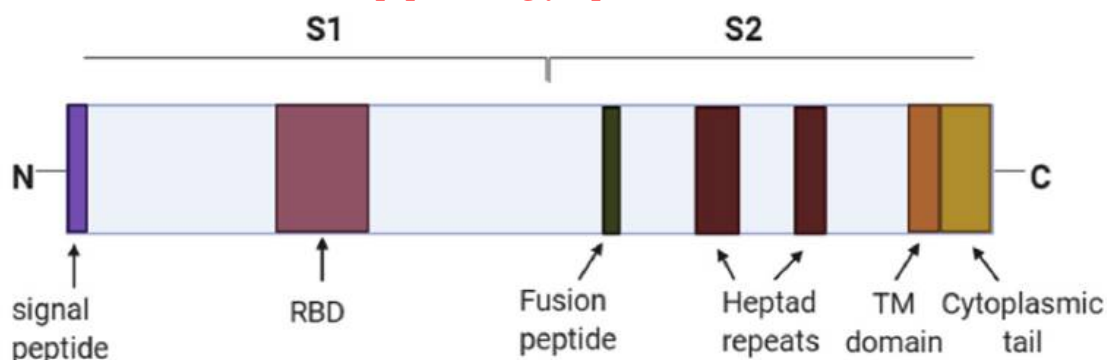
KIDs to Escape Corona

KIDs: Knowledge Intelligent (Information) Data systems

Information Source: ACS.org ;sciencedirect.com



A linear mapspike (S) glycoproteinof SARS-Cov-2



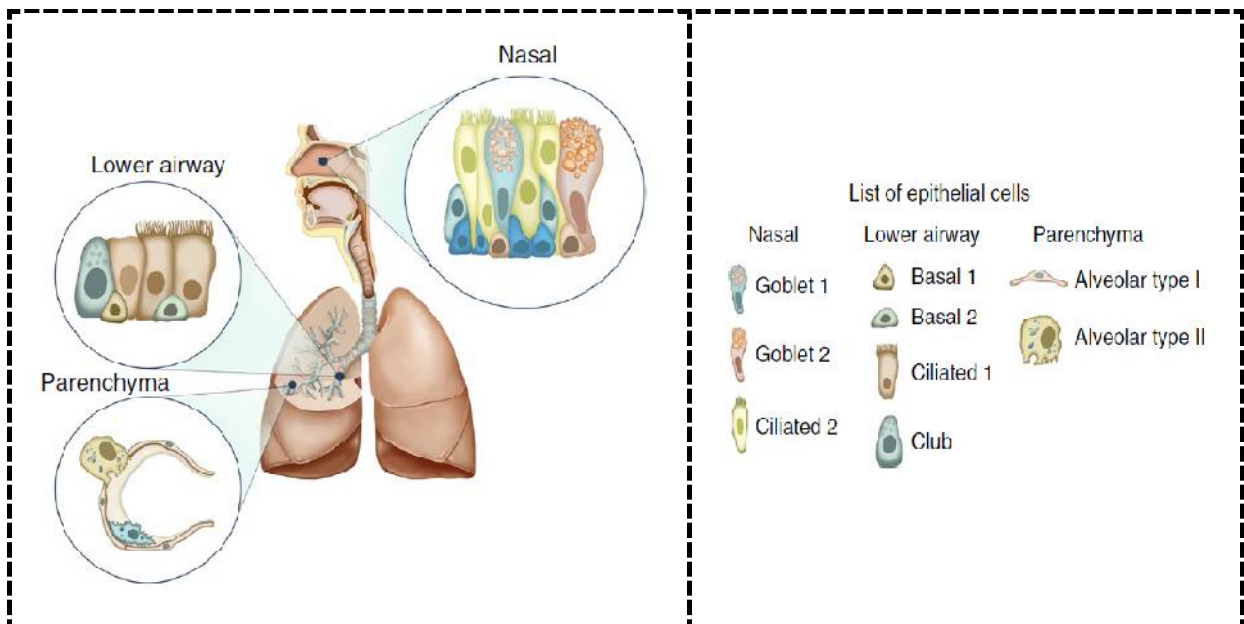
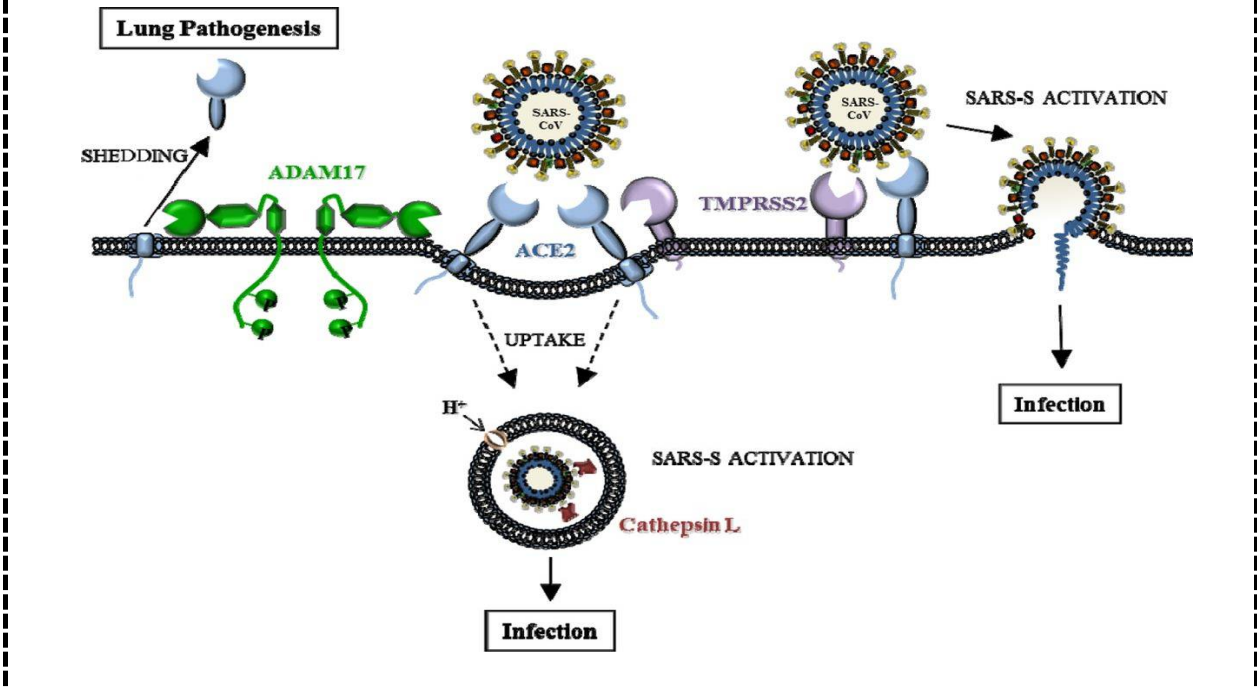
N-terminus S1 unit

- ☞ Contains receptor binding domain (RBD)
- 📖 Required for binding of virus to ACE2

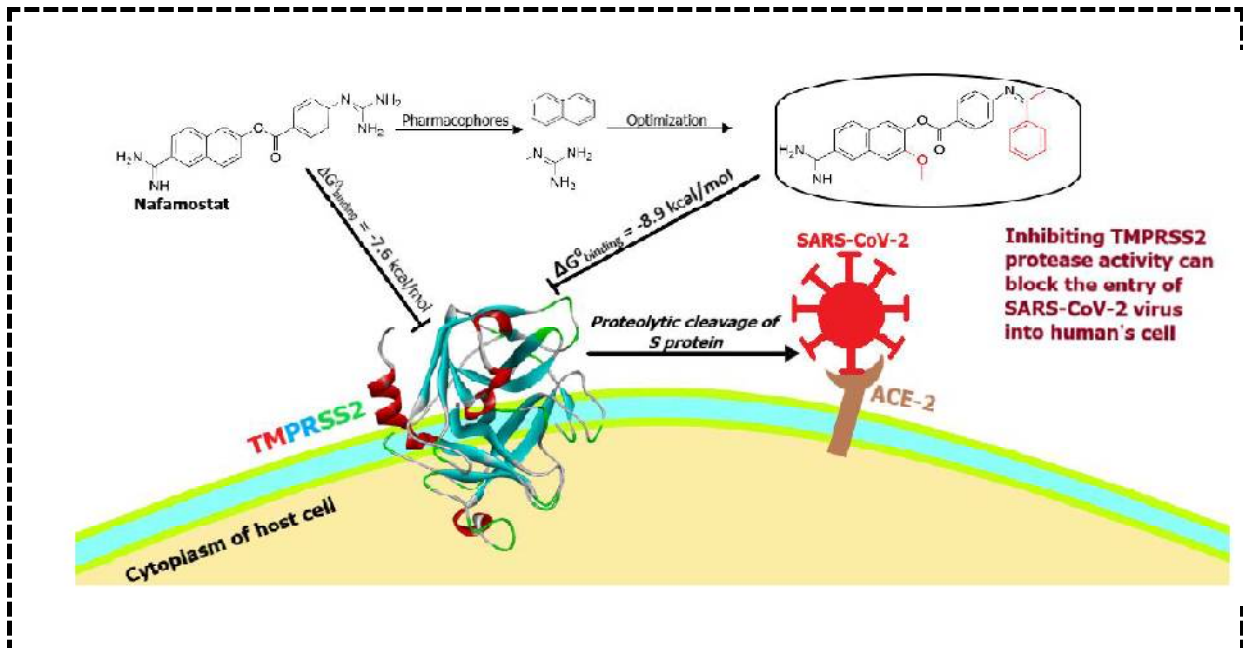
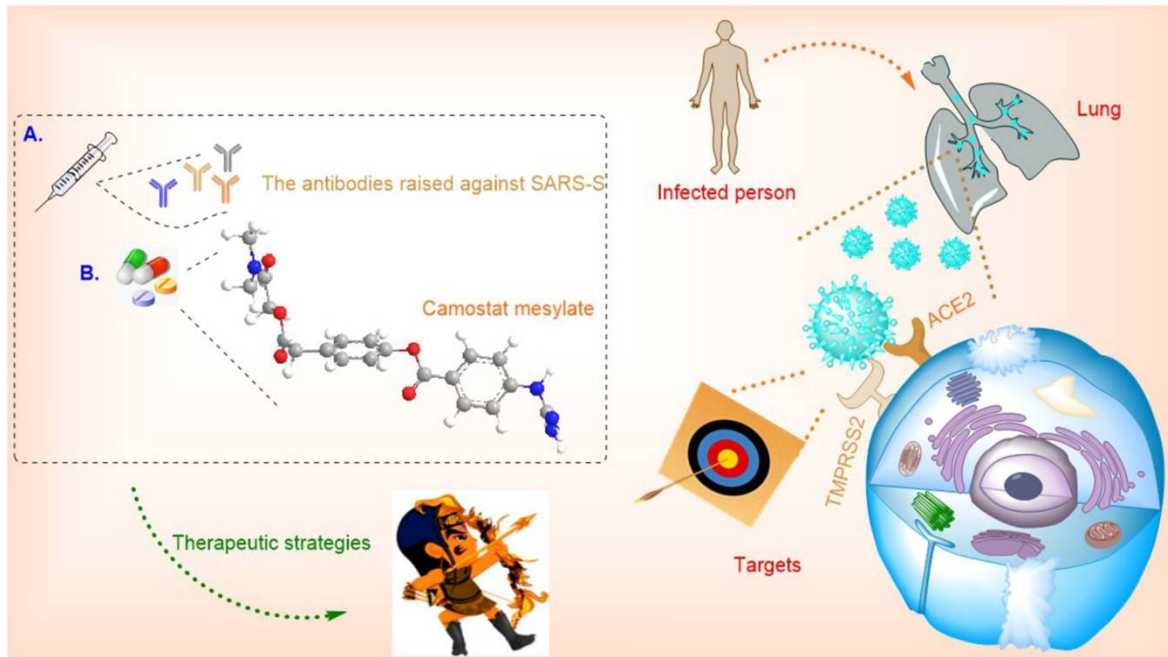
C-terminus S2unit

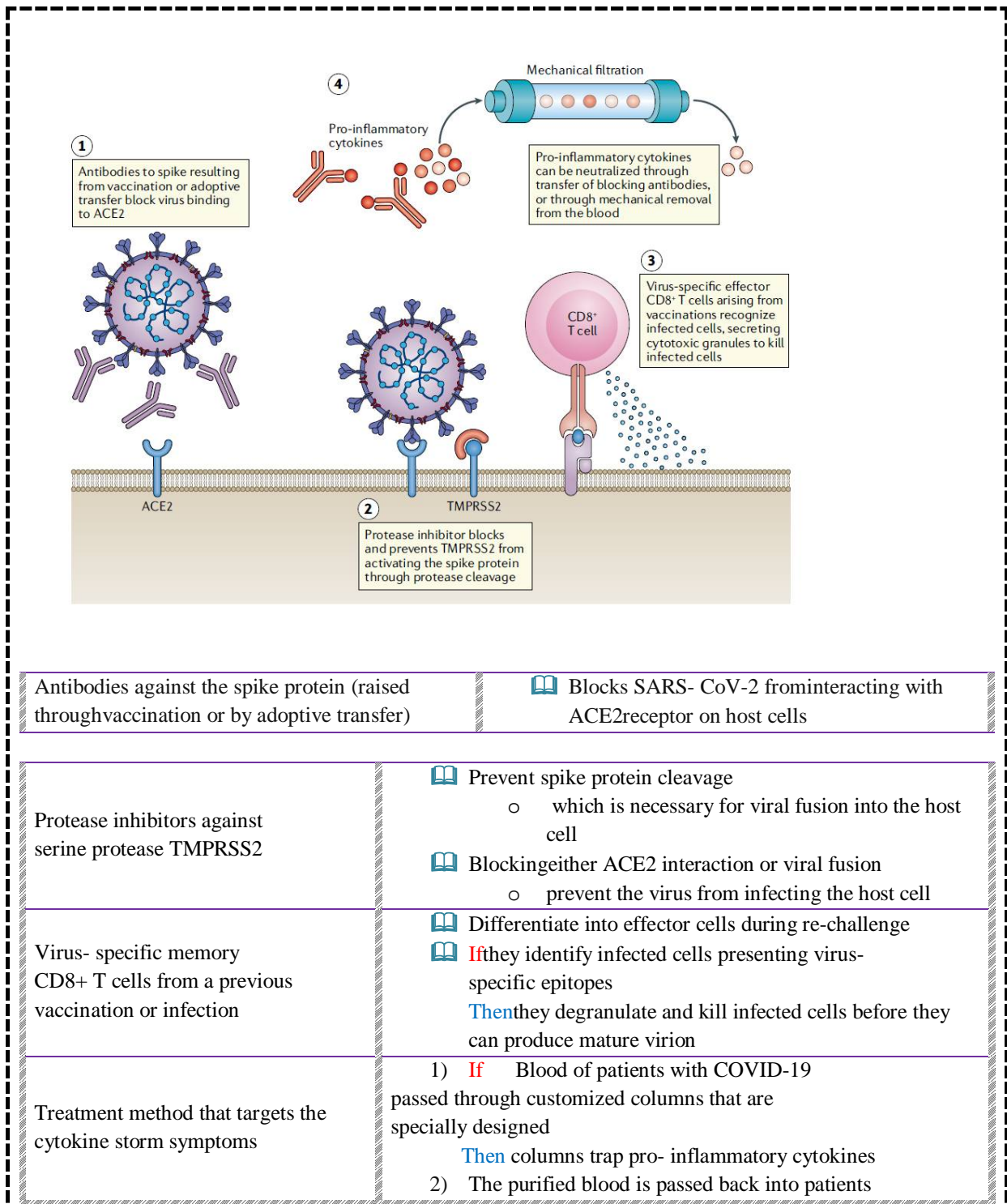
- 1) Harbours functional elements required for fusion
- 2) Contains a transmembrane domain (TM) for membrane anchoring
- 3) Cytoplasmic tail for appropriate intracellulartrafficking

Lung Pathogenesis



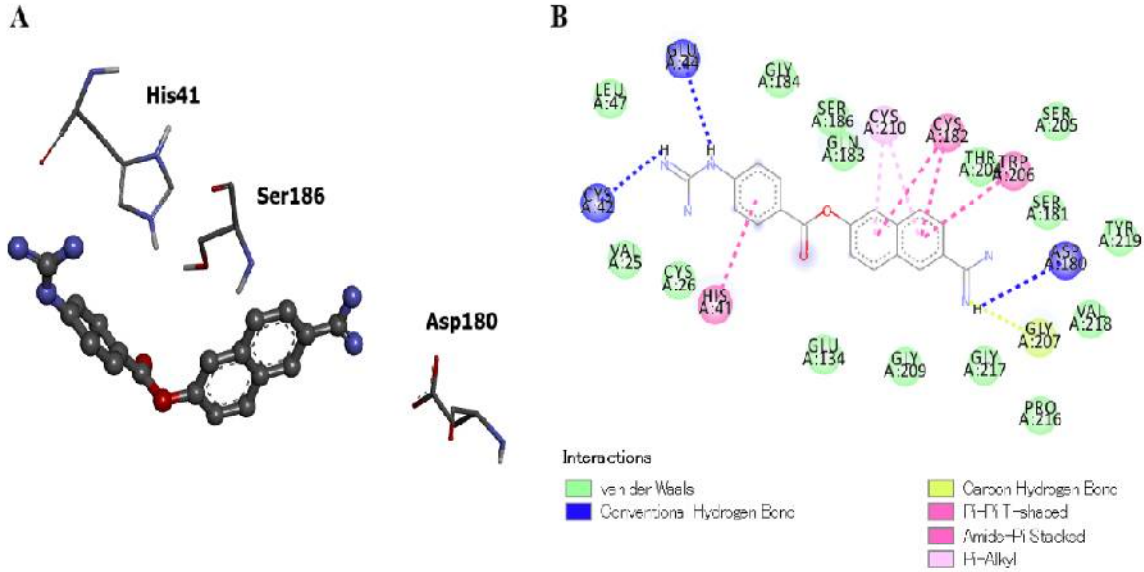
Therapeutic strategies





Interactions

Vander waals. Hydrogen bond, carbon-hydrogen bond, pi-pi



Modest improvements in medical treatment

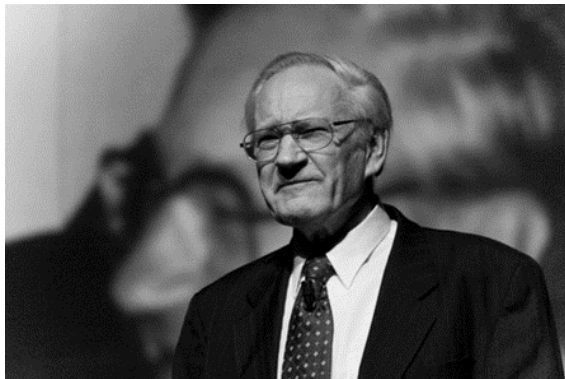
make a big difference

in patents' health

Research Profile of Richard R. Ernst (Nobel Laureate)

Richard R. Ernst

Born on 14 August 1933



Winterthur, Switzerland

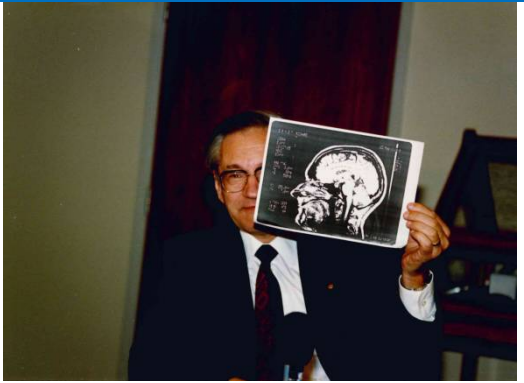
Affiliation

Swiss Federal Institute of Technology,
Zurich, Switzerland

Nobel Prize in Chemistry	Contributions to the development of the methodology of high resolution nuclear magnetic resonance (NMR) spectroscopy For the greatest benefit to humankind	1991
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Academic profile of Richard R. Ernst		
Undergraduate degree in chemical engineering	Swiss Federal Institute of Technology (Eidgenössische Technische Hochschule) in Zurich (ETH-Z)	1956
PhD Physical Chemistry	High-resolution NMR	1962

Employment. Richard R. Ernst		
1962-1968	Chemist at Varian Associates	Palo Alto, California
	Faculty member	
1968	Privatdozent in physical chemistry at the ETH	Zurich
1970	Assistant professor	ETH-Z
1976	Full professor	

<p>Awards (to) Richard R. Ernst</p>	
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Nobel Prize in Chemistry	Contributions to the development of the methodology of high resolution nuclear magnetic resonance (NMR) spectroscopy For the greatest benefit to humankind	1991
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Award(s)	year
Louisa Gross Horwitz Prize at Columbia University, along with colleague Kurt Wüthrich	1991
Wolf Prize in Chemistry in	1991.
Achievements in Magnetic Resonance EAS	1992
.....	

Royal Swedish Academy of Sciences' verdict

- 📖 Underscoring Ernst's impact, the Academy further stated, "This [development] has occurred because of a dramatic increase in both the sensitivity and the resolution of the instruments, two areas in which Ernst has contributed more than anybody else.
- 📖 Ernst's development of the methodology of high-resolution NMR spectroscopy is the most important instrumental measuring technique within chemistry.

(Open-heart musings of Richard R. Ernst)

- 📖 My life, so far, is full of chemical excitements
I confirm: A chemist remains a chemist
- 📖 I was born as an introverted person with difficulties to establish verbal human contacts
- 📖 Music became a way to live out my inhibited emotions
- 📖 Learned how to play violincello and demonstrated an interest in musical composition
- 📖 While exploring the family attic, I discovered a case filled with chemicals that had once belonged to my late uncle, who was a metallurgical engineer
- 📖 When I discovered the magic of chemistry, an exciting period of my life began: "I became almost immediately fascinated by the possibilities of trying out all conceivable reactions with them, some leading to explosions, others to unbearable poisoning of the air in our house, frightening my parents.
- 📖 However, I survived
- 📖 I wanted to understand the secrets behind my chemical experiments (at the age of twelve in 1945) and behind the processes in nature
- 📖 Soon, I knew that I would become a chemist, rather than a music composer
- 📖 I started to read all chemistry books that I could get a hand on, first some 19th century books from our home library
 - That did not provide much reliable information,
 - ! Then I emptied the rather extensive city library
- 👉 While studying college level chemistry at the Swiss Federal Institute of Technology, I continued my own studies through outside reading
- 👉 The text book Theoretical Chemistry by S. Glasstone was very influential,
 - It revealed fundamentals of quantum mechanics, spectroscopy, statistical mechanics, and statistical thermodynamics.
 - These subjects weren't typically addressed in academic lectures
- 📖 After receiving Ph.D., I wanted to leave the academic environment and find an industrial job in the United States
- ✓ Anderson's and my article on the application of Fourier transform spectroscopy to magnetic resonance was published in January 1966.
- ! Ernst recalled in his Nobel Lecture, "The paper that described our achievements was rejected

twice by the Journal of Chemical Physics. It was finally accepted and published in the Review of Scientific Instruments.

! Varian also resisted to build a spectrometer that incorporated the novel Fourier transform concept

☞ Myself and Anderson acquired the free induction decays in a time averaging computer and punched the data on paper tape

☞ The paper tape had to be carried from Palo Alto to IBM in San Jose to transfer the data to a bunch of cards.

☞ With the cards we went back to the Palo Alto Computer Service Center where the Fourier transformation and the plotting were done

☞ Tony Keller and his coworkers demonstrated in 1969 for the first time a commercial FT NMR spectrometer to the great amazement of Varian that had the patent rights on the invention

☞ My unexpected encounter with Tibetan Buddhist art in Nepal in 1968 was indeed “love on the first sight”. It continued to be one of my passions.



📖 Ernst learned that he had received the 1991 Nobel Prize in Chemistry while he was onboard an airplane flight to receive the Horwitz Prize. The aircraft's pilot called Ernst to the cockpit to give him the news about the Nobel award

Year	Select titles of research output of Richard R. Ernst high impact publications
2016	Witherspoon B, Braunlin K, Kumar AB. A Secure, Social Media-Based "Case of the Month" Module in a Neurocritical Care Unit. <i>American Journal of Critical Care : An Official</i>

	<i>Publication, American Association of Critical-Care Nurses.</i> 25: 310-7. PMID 27369029 DOI: 10.4037/ajcc2016203
2016	Renda L, Selçuk ÖT, Eyigör H, Osma Ü, Yılmaz MD. Smartphone Based Audiometric Test for Confirming the Level of Hearing; Is It Useable in Underserved Areas? <i>The Journal of International Advanced Otolaryngology.</i> 12: 61-6. PMID 27340985 DOI: 10.5152/iao.2016.1421
2013	Ernst RR. A chemist remains a chemist. <i>Angewandte Chemie (International Ed. in English).</i> 52: 61-7. PMID 23203565 DOI: 10.1002/anie.201205461
2012	Rance M , Sørensen OW , Bodenhausen G , Wagner G , Ernst RR , Wüthrich K . Improved spectral resolution in COSY (1)H NMR spectra of proteins via double quantum filtering. 1983. <i>Biochemical and Biophysical Research Communications.</i> 425: 527-33. PMID 22925669 DOI: 10.1016/j.bbrc.2012.08.019
2011	Kumar A , Welti D, Ernst RR. NMR Fourier zeugmatography. 1975. <i>Journal of Magnetic Resonance (San Diego, Calif. : 1997).</i> 213: 495-509. PMID 22152365 DOI: 10.1016/j.jmr.2011.09.019
2011	Bodenhausen G , Kogler H, Ernst RR. Selection of coherence-transfer pathways in NMR pulse experiments. 1984. <i>Journal of Magnetic Resonance (San Diego, Calif. : 1997).</i> 213: 276-94. PMID 22152348 DOI: 10.1016/j.jmr.2011.08.033
1999	Skrynnikov NR , Ernst RR. Detection of intermolecular chemical exchange through decorrelation of two-spin order. <i>Journal of Magnetic Resonance (San Diego, Calif. : 1997).</i> 137: 276-80. PMID 10053160 DOI: 10.1006/jmre.1998.1666
1998	Straus SK, Bremi T, Ernst RR. Experiments and strategies for the assignment of fully ¹³ C/ ¹⁵ N-labelled polypeptides by solid state NMR. <i>Journal of Biomolecular Nmr.</i> 12: 39-50. PMID 9729787
1998	Lienin SF, Brüschweiler R, Ernst RR. Rotational Motion of a Solute Molecule in a Highly Viscous Liquid Studied by ¹³ C NMR: 1,3-Dibromoadamantane in Polymeric Chlorotrifluoroethene <i>Journal of Magnetic Resonance (San Diego, Calif. : 1997).</i> 131: 184-90. PMID 9571091
1998	Brutscher B, Skrynnikov NR , Bremi T, Brüschweiler R, Ernst RR. Quantitative investigation of dipole-CSA cross-correlated relaxation by ZQ/DQ spectroscopy. <i>Journal of Magnetic Resonance (San Diego, Calif. : 1997).</i> 130: 346-51. PMID 9500898
1997	Utz M, Eisenegger J, Suter UW , Ernst RR. Determination of orientational anisotropy in glassy solids by 2D dipolar spectra with sample flipping. <i>Journal of Magnetic Resonance (San Diego, Calif. : 1997).</i> 128: 217-27. PMID 9356276 DOI: 10.1006/jmre.1997.1222
1997	Brutscher B, Brüschweiler R, Ernst RR. Backbone dynamics and structural characterization of the partially folded A state of ubiquitin by ¹ H, ¹³ C, and ¹⁵ N nuclear magnetic resonance spectroscopy. <i>Biochemistry.</i> 36: 13043-53. PMID 9335566 DOI: 10.1021/bi971538t
1997	Gan Z, Ernst RR. Frequency- and phase-modulated heteronuclear decoupling in rotating solids. <i>Solid State Nuclear Magnetic Resonance.</i> 8: 153-9. PMID 9211619
1996	Peng JW , Schiffer CA , Xu P, van Gunsteren WF , Ernst RR. Investigations of peptide hydration using NMR and molecular dynamics simulations: A study of effects of water on the conformation and dynamics of antamanide. <i>Journal of Biomolecular Nmr.</i> 8: 453-76. PMID 20859779 DOI: 10.1007/BF00228147

1993	Blackledge MJ, Brüschweiler R, Griesinger C , Schmidt JM, Xu P, Ernst RR . Conformational backbone dynamics of the cyclic decapeptide antamanide. Application of a new multiconformational search algorithm based on NMR data. <i>Biochemistry</i> . 32: 10960-74. PMID 8218162
1993	Zhang S, Meier BH , Ernst RR . Local monitoring of proton spin diffusion in static and rotating samples via spy detection. <i>Solid State Nuclear Magnetic Resonance</i> . 1: 313-20. PMID 7834306
1992	Zhang S, Meier BH , Ernst RR . Polarization echoes in NMR. <i>Physical Review Letters</i> . 69: 2149-2151. PMID 10046411
1990	Roux B, Brüschweiler R, Ernst RR . The structure of gramicidin A in dimethylsulfoxide/acetone. <i>European Journal of Biochemistry / Febs</i> . 194: 57-60. PMID 1701388 DOI: 10.1111/j.1432-1033.1990.tb19426.x
1985	Schweiger A, Braunschweiler L, Fauth J, Ernst RR . Coherent and incoherent echo spectroscopy with extended-time excitation. <i>Physical Review Letters</i> . 54: 1241-1244. PMID 10030974
1983	Rance M , Sørensen OW, Bodenhausen G , Wagner G , Ernst RR , Wüthrich K . Improved spectral resolution in cosy 1H NMR spectra of proteins via double quantum filtering. <i>Biochemical and Biophysical Research Communications</i> . 117: 479-85. PMID 6661238 DOI: 10.1016/0006-291X(83)91225-1
1980	Kumar A, Ernst RR , Wüthrich K . A two-dimensional nuclear Overhauser enhancement (2D NOE) experiment for the elucidation of complete proton-proton cross-relaxation networks in biological macromolecules. <i>Biochemical and Biophysical Research Communications</i> . 95: 1-6. PMID 7417242
1980	Kumar A, Wagner G, Ernst RR , Wüthrich K . Studies of J-connectives and selective 1H-1H Overhauser effects in H2O solutions of biological macromolecules by two-dimensional NMR experiments. <i>Biochemical and Biophysical Research Communications</i> . 96: 1156-63. PMID 6159893
1979	Nagayama K, Wüthrich K , Ernst RR . Two-dimensional spin echo correlated spectroscopy (SECSY) for 1H NMR studies of biological macromolecules. <i>Biochemical and Biophysical Research Communications</i> . 90: 305-11. PMID 496980 DOI: 10.1016/0006-291X(79)91625-5
1979	Nagayama K, Bachmann P, Ernst RR , Wüthrich K . Selective spin decoupling in the J-resolved two-dimensional 1H n.m.r. spectra of proteins. <i>Biochemical and Biophysical Research Communications</i> . 86: 218-25. PMID 435302
1977	Nagayama K, Wüthrich K , Bachmann P, Ernst RR . Two-dimensional J-resolved 1H n.m.r. spectroscopy for studies of biological macromolecules. <i>Biochemical and Biophysical Research Communications</i> . 78: 99-105. PMID 907694

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