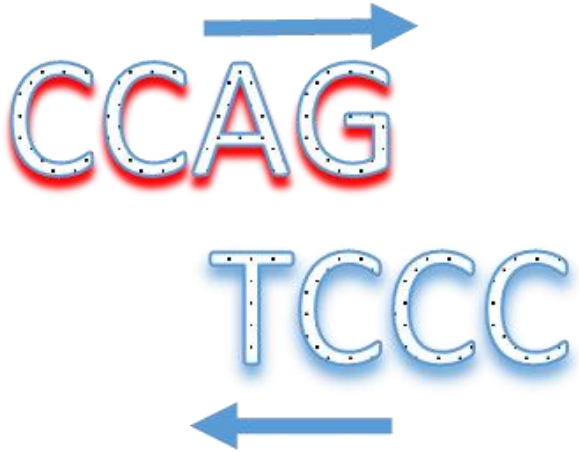
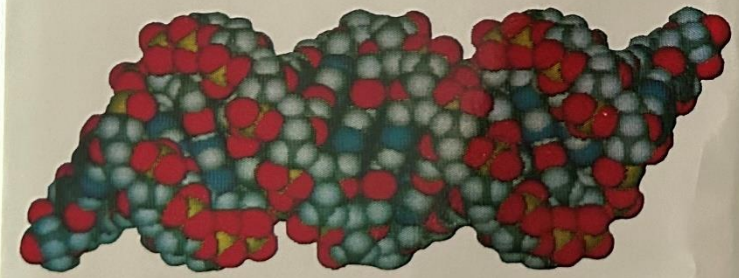


Daniele F. Condorelli 10 Nov 2023

F. Crick and J. Watson. "The Complementary Structure of Deoxyribonucleic Acid." Proceedings of the Royal Society of London.

FRANCIS
CRICK

LA FOLLE CACCIA



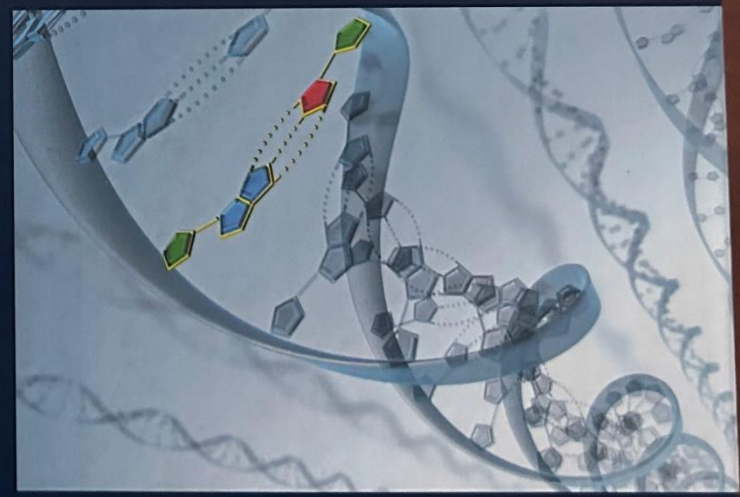
La vera storia della scoperta del codice genetico

RIZZOLI

LA GRANDE BIBLIOTECA DELLA SCIENZA

James D. Watson

LA DOPPIA ELICA



FABBRI EDITORI

Pag 737-738

equipment, and to Dr. G. E. R. Deacon and the captain and officers of R.R.S. *Discovery II* for their part in making the observations.

[1] Young, F. B., Gerrard, H., and Jevons, W., *Phil. Mag.*, **40**, 149 (1920).
[2] Longuet-Higgins, M. S., *Mon. Not. Roy. Astro. Soc., Geophys. Supp.*, **5**, 285 (1949).
[3] Von Arx, W. S., Woods Hole Papers in Phys. Oceanog. Meteor., **11** (3) (1950).
[4] Ekman, V. W., *Arkiv. Mat. Astron. Fysik.* (*Stockholm*), **2** (11) (1905).

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

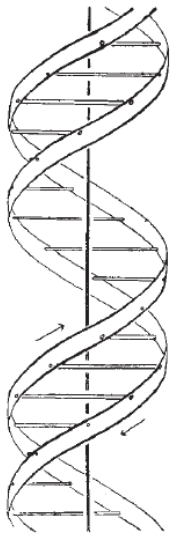
A Structure for Deoxyribose Nucleic Acid

We wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey[1]. They kindly made their manuscript available to us in advance of

J. D. Watson
F. H. C. Crick

Medical Research Council Unit for the Study of the Molecular Structure of Biological Systems,
Cavendish Laboratory, Cambridge.



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Pag 738-740

Molecular Structure of Deoxypentose Nucleic Acids

While the biological properties of deoxypentose nucleic acid suggest a molecular structure containing great complexity, X-ray diffraction studies described here (cf. Astbury[1]) show the basic molecular configuration has great simplicity. The purpose of

M. H. F. Wilkins

Medical Research Council Biophysics Research Unit,

A. R. Stokes
H. R. Wilson

Wheatstone Physics Laboratory,
King's College, London.
April 2.

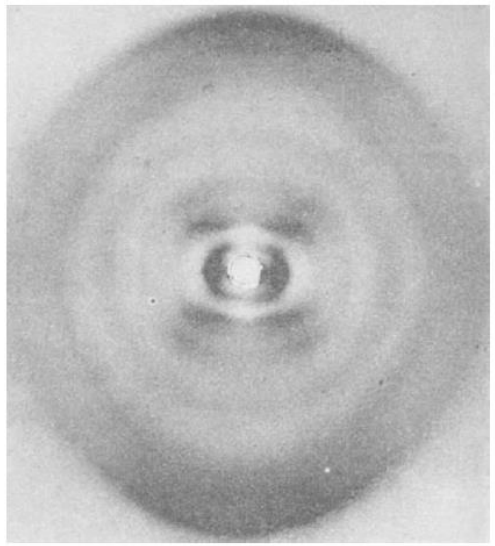


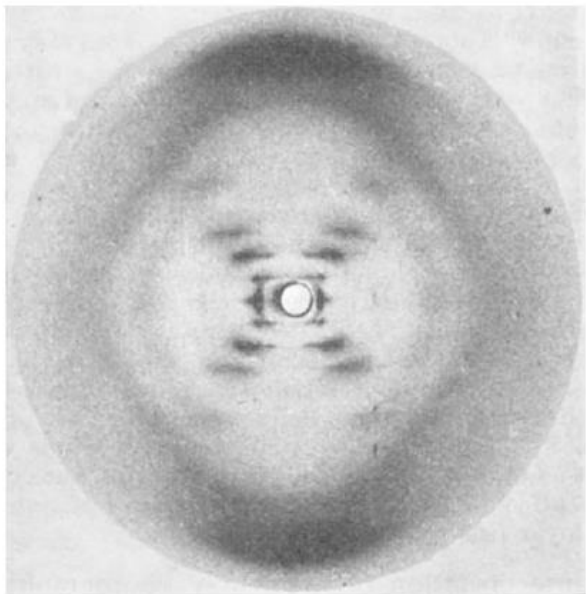
Fig. 1. Fibre diagram of deoxypentose nucleic acid from *B. coli*. Fibre axis vertical

Pag 740-741

Molecular Configuration in Sodium Thymonucleate

Rosalind E. Franklin*
R. G. Gosling

Wheatstone Physics Laboratory,
King's College, London.
April 2.



Sodium deoxyribose nucleate from calf thymus. Structure *B*

The previously published X-ray data[5,6] on deoxyribose nucleic acid are insufficient for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unproved until it has been checked against more exact results. Some of these are given in the following communications.

It must be stressed that some of the above discussion is not without ambiguity, but in general there appears to be reasonable agreement between the experimental data and the kind of model described by Watson and Crick (see also preceding communication).

Thus our general ideas are not inconsistent with the model proposed by Watson and Crick in the preceding communication.

Watson (1928) and Crick (1916 –2004): 25 anni e 37 anni

Maurice Wilkins (1916–2004): 37 anni nel 1953

Rosalind Franklin (1920 – 1958): 33 anni nel 1953

April 25th is DNA Day – commemorating both the **completion of the Human Genome Project in 2003**, and the **discovery of the double helix in 1953**.

108TH CONGRESS
1ST SESSION

S. CON. RES. 10

Designating April 2003 as "Human Genome Month" and April 25 as "DNA Day".

IN THE SENATE OF THE UNITED STATES

FEBRUARY 27, 2003

Mr. GREGG (for himself, Mr. KENNEDY, Ms. SNOWE, and Mr. DASCHLE) submitted the following concurrent resolution; which was considered and agreed to

---

CONCURRENT RESOLUTION

Designating April 2003 as "Human Genome Month" and April 25 as "DNA Day".

International Consortium Completes Human Genome Project

National Human Genome Research Institute
National Institutes of Health
Department of Health and Human Services
and
Office of Science
U.S. Department of Energy

International Consortium Completes Human Genome Project

All Goals Achieved; New Vision for Genome Research Unveiled

BETHESDA, Md., April 14, 2003 - The International Human Genome Sequencing Consortium, led in the United States by the National Human Genome Research Institute (NHGRI) and the Department of Energy (DOE), today announced the successful completion of the Human Genome Project more than two years ahead of schedule.

National DNA Day

The six milestone papers on the structure of DNA

1. WATSON, J. D. & CRICK, F. H. C. Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid;
2. WILKINS, M. H. F., STOKES, A. R. & WILSON, H. R. Molecular Structure of Deoxypentose Nucleic Acids;
3. FRANKLIN, R. E. & GOSLING, R. G. Molecular Configuration in Sodium Thymonucleate, pp. 737-41 in Nature, Vol. 171, No. 4356, ***April 25****, 1953.*

4. WATSON, J. D. & CRICK, F. H. C. Genetical Implications of the Structure of Deoxyribonucleic Acid, pp. 964-7 in Nature, Vol. 171, No. 4361, **May** *30, 1953.*

5. FRANKLIN, R. E. & GOSLING, R. G. Evidence for 2-Chain Helix in Crystalline Structure of Sodium Deoxyribonucleate, pp. 156-7 in Nature, Vol. 172, No. 4369, ***July*** *25, 1953.*

6. WILKINS, M. H. F., SEEDS, W. E. STOKES, A. R. & WILSON, H. R. Helical Structure of Crystalline Deoxypentose Nucleic Acid, pp. 759-62 in Nature, Vol. 172, No. 4382, **October** *24, 1953.*

Nature April 25, 1953 Watson and Crick:

Full details of the structure, including the conditions assumed in building it, together with a set of co-ordinates for the atoms, will be published elsewhere.

The complementary structure of deoxyribonucleic acid

By F. H. C. Crick and J. D. Watson*†

Medical Research Council Unit for the Study of the Molecular Structure of Biological Systems, Cavendish Laboratory, University of Cambridge

(*Communicated by Sir Lawrence Bragg, F.R.S.—Received 24 August* 1953)

07 April 1954 Volume 223Issue 1152

PROCEEDINGS OF THE ROYAL SOCIETY A

MATHEMATICAL, PHYSICAL AND ENGINEERING SCIENCES

Scoperta e Composizione chimica del DNA

Johan Friedrich Miescher (Basilea, 13 agosto 1844 – Davos, 26 agosto 1895) isolò per la prima volta gli acidi nucleici nel 1869 da bende intrise di pus presso i laboratori di Felix Hoppe-Seyler a Tubinga.

Albrecht Kossel (Rostock, 16 settembre 1853 – Heidelberg, 5 luglio 1927) è stato un medico, chimico e fisiologo tedesco.

Erwin Chargaff (Černivci, 11 agosto 1905 – New York, 20 giugno 2002) è stato un biochimico e scrittore austriaco.

Ruolo del DNA nella trasmissione dell'informazione genetica

Oswald Avery, Colin MacLeod and Maclyn McCarty 1944 (DNA come principio trasformante di Griffith)

Al Hershey and Martha Chase 1952: Ingresso del DNA del batteriofago nella cellula batterica.

Delucidazione del codice genetico

Marshall Nirenberg e **Heinrich Matthaei** 1961

Meccanismo enzimatico di sintesi del DNA

Arthur Kornberg 1958: **Enzymatic Synthesis of Deoxyribonucleic Acid. I. Preparation of Substrates and Partial Purification of an Enzyme from *Escherichia coli* (Lehman, I. R., Bessman, M. J., Simms, E. S., and Kornberg, A. (1958) *J. Biol. Chem.* 233, 163-170).**

Struttura ad elica per gli acidi nucleici

ACTA CHEMICA SCANDINAVICA 6 (1952) 634–640

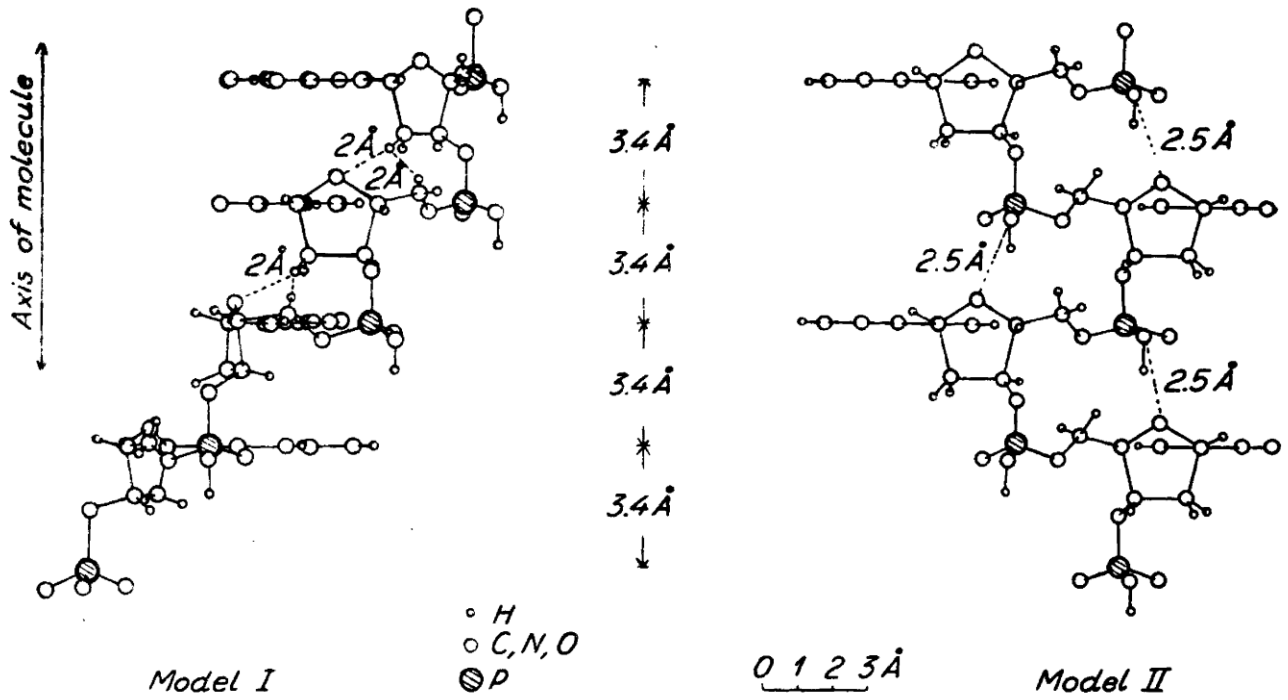


Fig. 2. Two models of thymonucleic acid based on nucleotides of the "standard" configuration. The planes of the purine and pyrimidine rings are perpendicular to the plane of the paper.

On the Structure of Nucleic Acids

SVEN FURBERG

Institute of Chemistry, University of Oslo, Blindern — Oslo, Norway

A PROPOSED STRUCTURE FOR THE NUCLEIC ACIDS

By Linus Pauling and Robert B. Corey

Gates and Crellin Laboratories of Chemistry,* California Institute of Technology

Communicated December 31, 1952

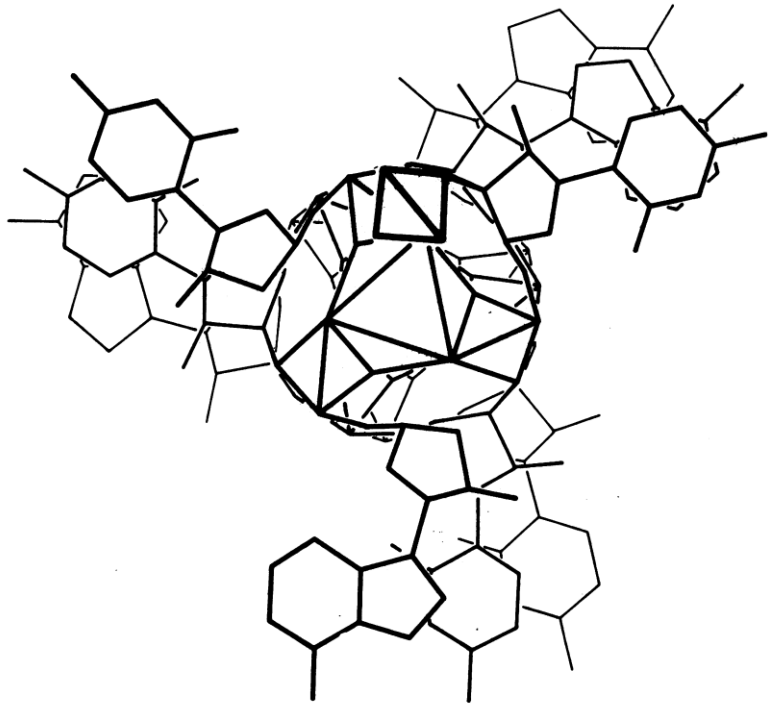
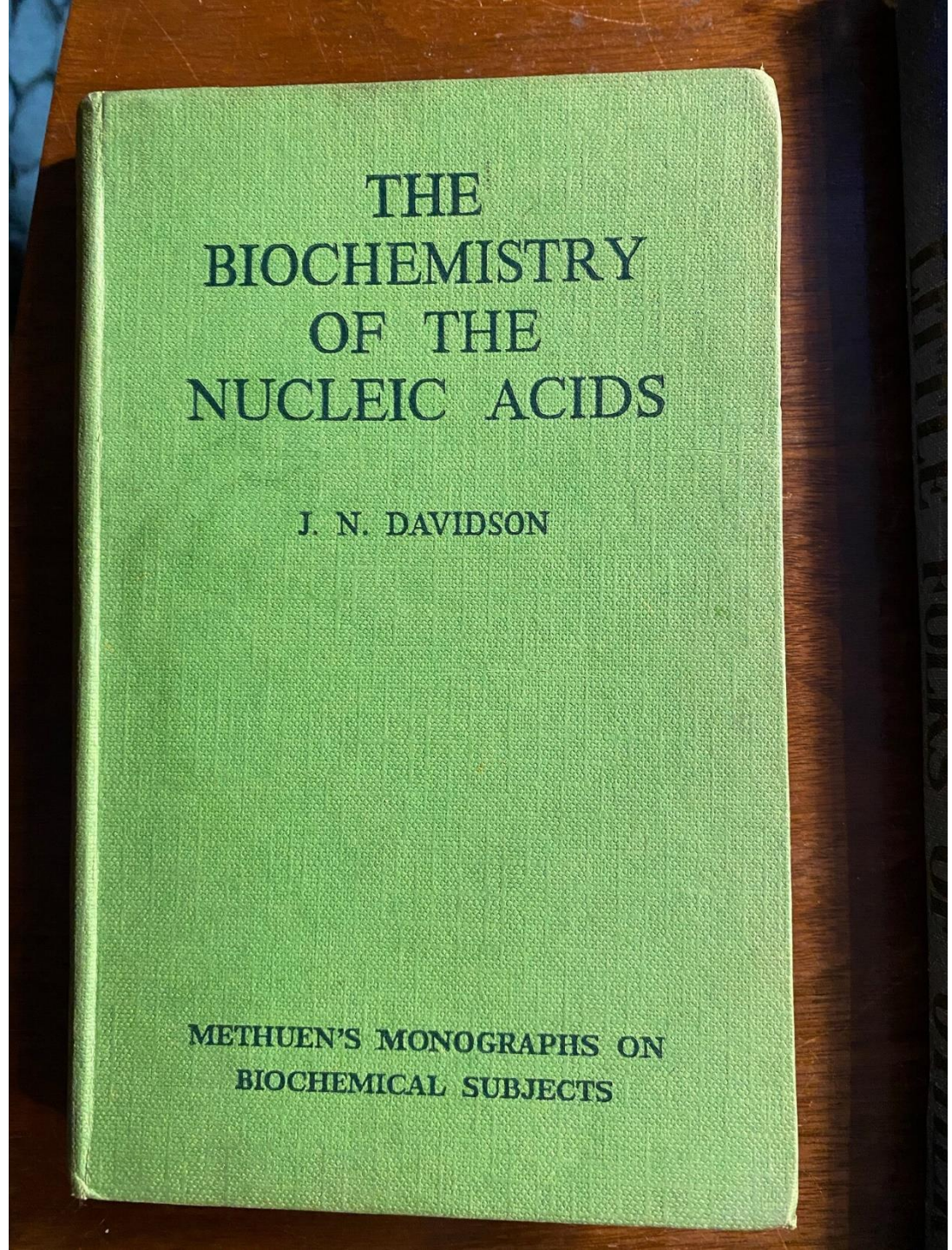


FIGURE 6

Plan of the nucleic acid structure, showing several nucleotide residues.

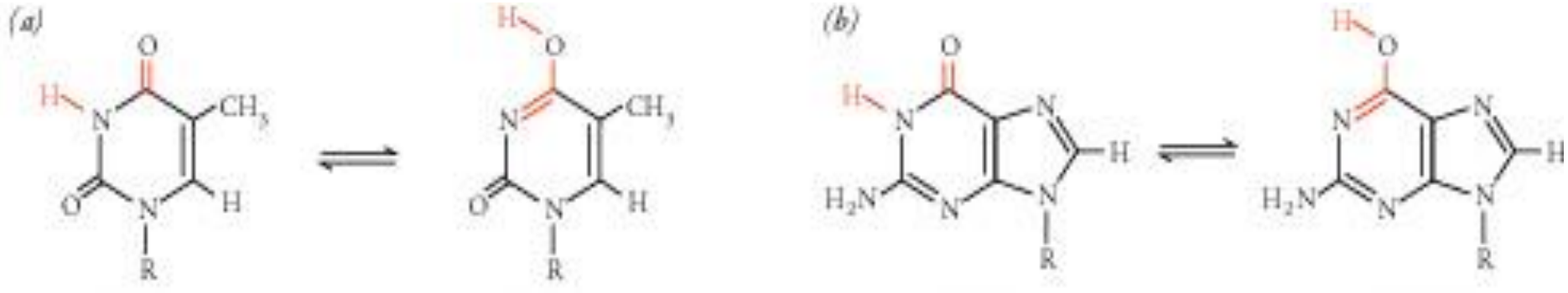

THE
BIOCHEMISTRY
OF THE
NUCLEIC ACIDS
J. N. DAVIDSON
METHUEN'S MONOGRAPHS ON
BIOCHEMICAL SUBJECTS

Jerry Donohue (June 12, 1920 – February 13, 1985) was an American theoretical and physical chemist. He is best remembered for steering James D. Watson and Francis Crick towards the correct structure of DNA with some crucial information. In 1952, Donohue was given a Guggenheim Foundation grant to study at Cambridge University for 6 months. He shared an office with Francis Crick and James D. Watson.

Watson and Crick Nature April 25, 1953

"We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on interatomic distances".

TIMINA **GUANINA**



Forma chetonica o lattamica	Forma enolica o lattimica	Forma chetonica o lattamica	Forma enolica o lattimica

Tautomeria cheto-enolica delle basi

Doppia elica

1) **scheletro zucchero-fosfato all'esterno**

2) Catene antiparallele

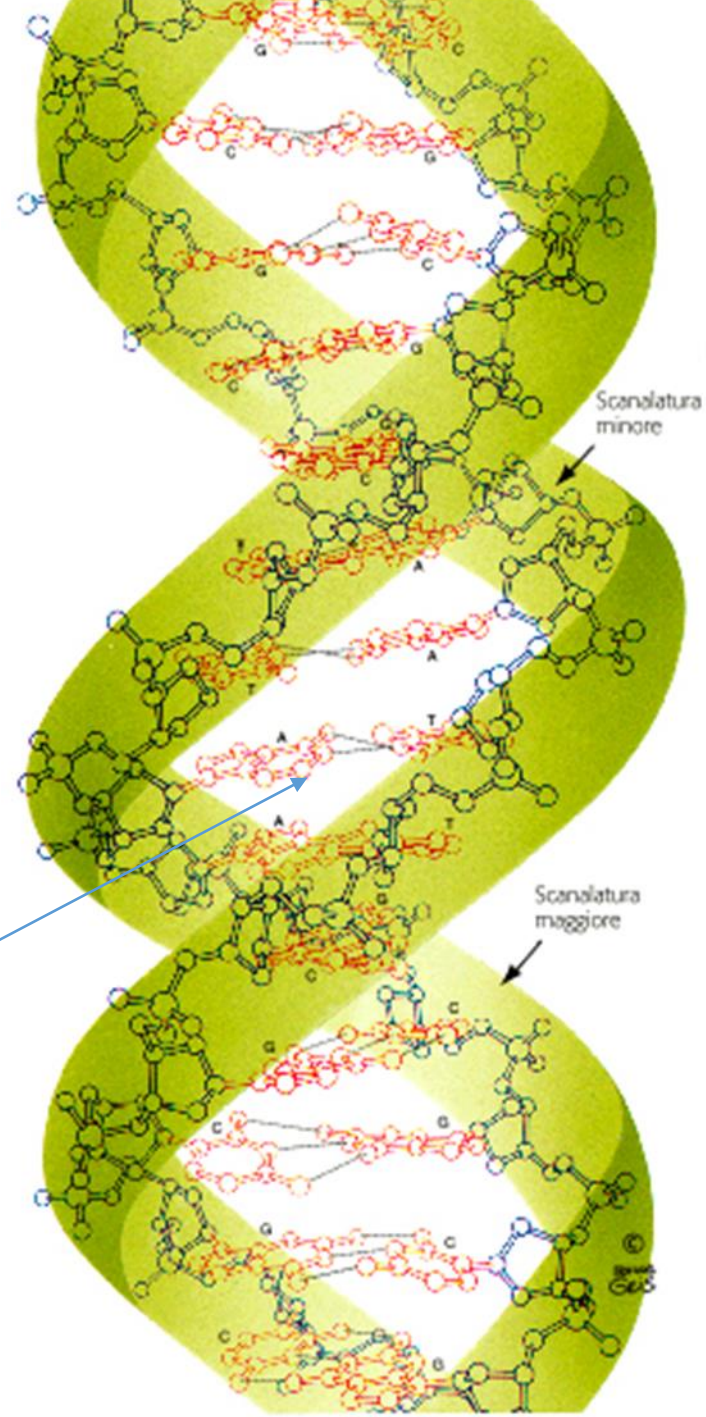
3) Le catene antiparallele si avvolgono con andamento destrorso

4) I piani delle basi sono quasi perpendicolari all'asse dell'elica

5) 10 coppie di basi per giro dell'elica.
Innalzamento dell'elica per coppia di basi=3.4 Å
Passo dell'elica= 34 Å

6) Solco maggiore e solco minore

7) Appaiamento delle basi complementari all'interno dell'elica

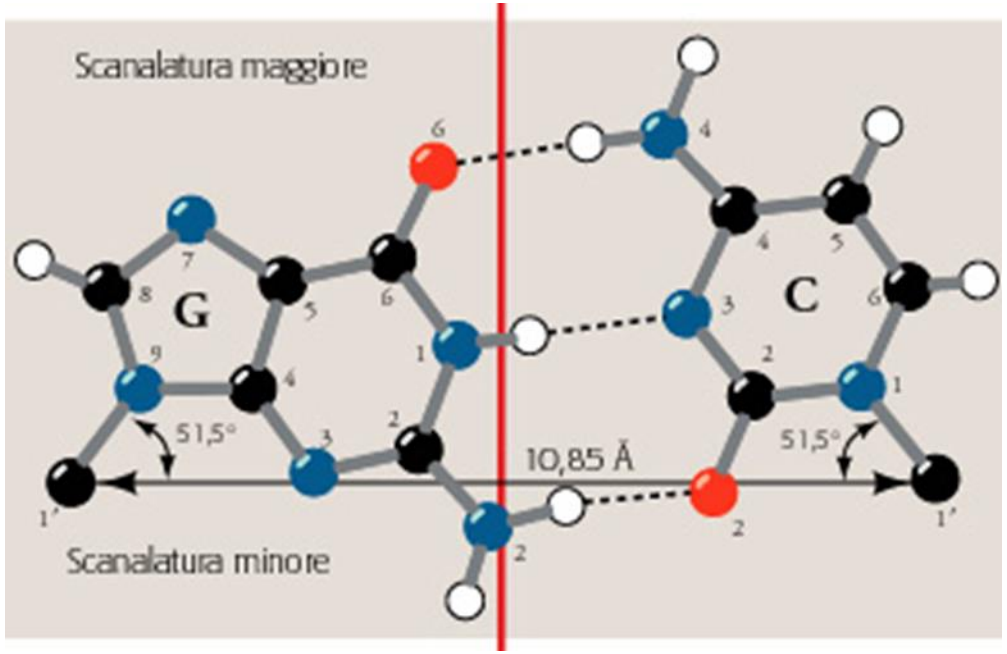


NATURE|Vol 439|2 February 2006

The third Bond

When James Watson and Francis Crick unveiled their structure of DNA , one of the two kinds of base pair in the molecule was given two hydrogen bonds instead of three. Who spotted the third bond and when?

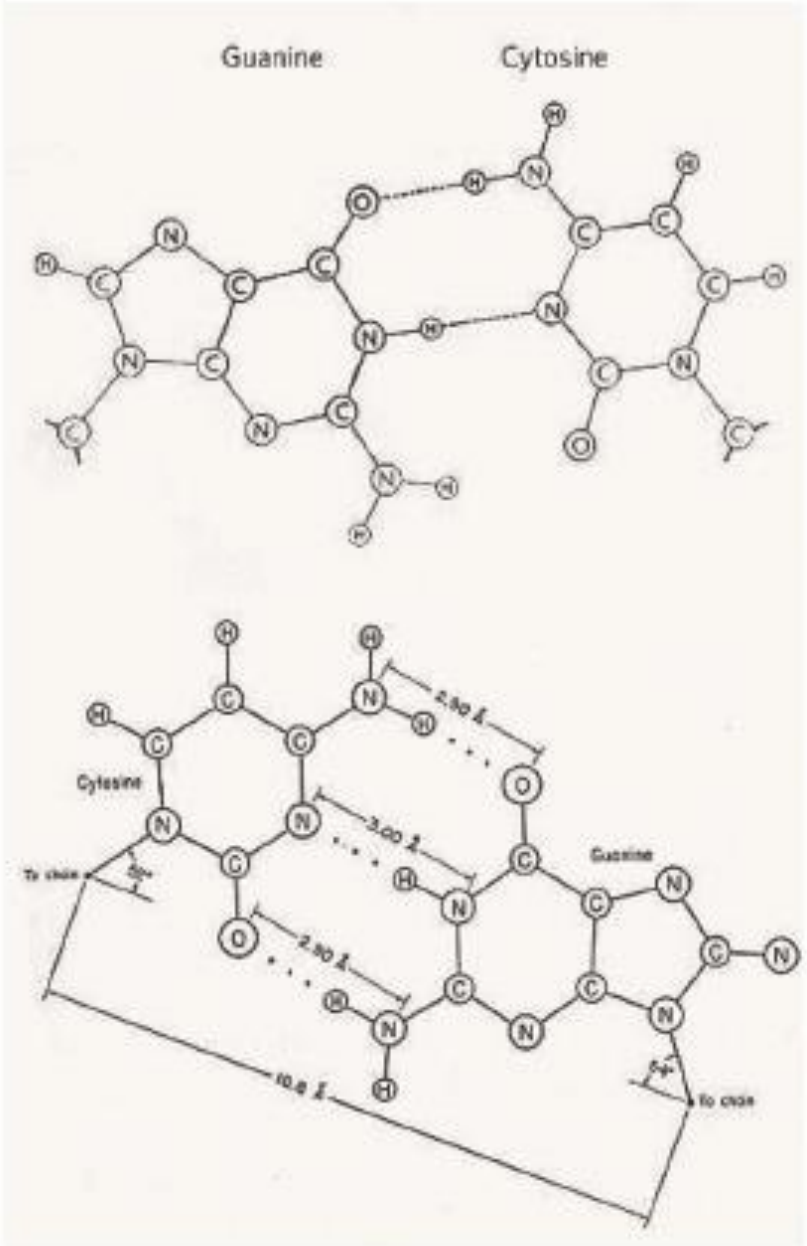
Simon Wain-Hobson



Linus Pauling, Robert B. Corey

Specific hydrogen-bond formation between pyrimidines and purines in deoxyribonucleic acids

Archives of Biochemistry and BiophysicsVolume 65, Issue 1, November **1956**, Pages 164-181



The third hydrogen bond in a guanine–cytosine base pair (bottom) was missed in the 1953 description of DNA (top).