



ISOBC NEWSLETTER

2024

Volume 19, Number 1



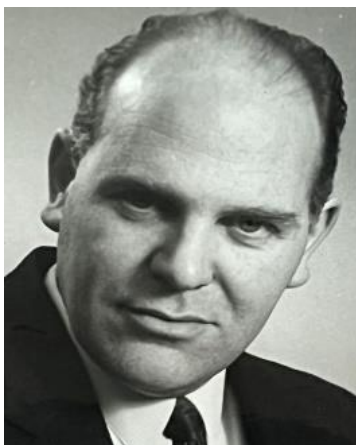
ISOBC Newsletter

March 2024

Volume 19, Number 1

Iran Society of Biophysical Chemistry

Obituary



Malcolm N. Jones (14 October 1936 – 22 June 2023)

**Prepared by Ali A. Moosavi-Movahedi
Institute of Biochemistry and Biophysics,
University of Tehran, Tehran, Iran**

It is with a heavy heart that I extend my deepest condolences to myself and the scientific community, particularly to Biophysical Chemists worldwide, on the passing of Professor M. N. Jones.

I had the privilege of joining Professor Jones' research group at the Department of Biochemistry, Medical School, University of Manchester, as a PhD student in 1984. He served not only as my mentor but also as a caring supervisor. Even before delving into the research for my thesis, he ensured the well-being of my family and me, striving to create a peaceful environment for us. With his guidance, I embarked on my thesis journey, titled "Thermodynamic studies of the interaction between detergents and catalases".



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Although I had two supervisors, including Prof. G. Pilcher from the Chemistry Department, University of Manchester, most of my work was under the supervision of Prof. M. N. Jones. My research started with investigating the interaction of sodium dodecyl sulfate (SDS) with catalase using isothermal batch calorimetry, alongside exploring various biochemical and biophysical tools. Given the prolonged time required to obtain enthalpy curves with the isothermal batch calorimetry device, we envisioned designing a more efficient method. With Prof. Pilcher's assistance, we pioneered the development of an isothermal titration calorimetric technique, a novel approach at the time. This involved creating a new titration cell for the Benzinger's calorimeter, significantly reducing the time required for each sample point and obtaining an enthalpy curve in about an hour, compared to several weeks with batch calorimetry. The results of my thesis research were published in several journals (1-5).

I recalled engaging in scientific discussions with Prof. Jones, and one particular memory stands out. I once posed a complex question about the most meaningful and efficient physicochemical parameter. After a few minutes' thoughtful consideration, he suggested that the binding equilibrium constant (K) might be the most suitable option. Remarkably, after four decades of research in Biophysical Chemistry, I arrived at the same conclusion.

In an era before email and computer communication, I corresponded with Prof. Jones through letters, treasuring each exchange. His integrity and greatness inspired me to share his wisdom with my students. I even arranged for one of my students to collaborate with him in his laboratory in Manchester for about six months in 1992, resulting in a joint publication (6).

Prof. M. N. Jones authored several books, including "Biochemical Thermodynamics" (Elsevier, 1988) and "Biological Interface" (Elsevier, 1975). His cultured personality and moral character left a lasting impression on me, and I will

always cherish the lessons learned from him. May God grant him mercy and eternal remembrance for his noble deeds.

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Thomas E. Creighton: A Scientific Journey

Prepared by Javad Azadipour

PhD student in Biophysics, Institute of Biochemistry and Biophysics, University of Tehran.

Thomas E. Creighton, born in Scotland in 1944, harbored a profound fascination for science and chemistry from an early age. His academic journey led him to the University of Edinburgh, where he earned a BSc in chemistry in 1966. Subsequently,

he ventured to Cambridge University, where he became part of the renowned laboratory led by Frederick Sanger, a Nobel laureate celebrated for pioneering protein sequencing.

Within this scholarly haven, Creighton delved into the intricate realms of insulin and various proteins, culminating in the acquisition of his PhD in biochemistry in 1970. He embarked on postdoctoral research at Harvard University and the University of California, San Francisco, collaborating with the illustrious figure in protein folding research, Cyrus Levinthal.

His research was centered on unraveling the mysteries of ribonuclease A, a petite enzyme catalyzing RNA cleavage. He employed an arsenal of techniques, encompassing circular dichroism, fluorescence spectroscopy, and hydrogen exchange labeling, to meticulously monitor protein structural changes during folding and unfolding. Temperatures, pH levels, denaturants, and disulfide bonds were scrutinized for their impacts on the intricate dance of protein folding.

In 1978, Creighton's journey led him to the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, where he assumed the roles of a group leader and senior scientist. There, he founded a research group dedicated to exploring the domains of protein folding and stability. His scholarly explorations expanded to encompass the pivotal role of molecular chaperones, proteins that guide others through the labyrinthine path of correct folding.

In 1992, Creighton presented his magnum opus, "Protein Folding," an authoritative tome serving as a comprehensive guide to the ever-evolving landscape of protein folding research. This seminal work covered diverse facets of protein folding, encompassing thermodynamics, kinetics, pathways, intermediates, models, simulations, experimental techniques, and the profound biological implications. Collaborating with esteemed experts in the field, including Martin Karplus, Oleg Ptitsyn, Robert Freedman, and Jean-Renaud Garel, Creighton's book etched its

name as an indomitable classic, an indispensable resource for anyone delving into the world of protein folding.

After an illustrious career at EMBL, Creighton retired in 2000, relocating to London, where he remains ardently dedicated to crafting and editing books and articles revolving around protein folding and its allied themes. His contributions were duly recognized, adorning him with honors such as the Max Planck Research Award (1994), the Stein & Moore Award (1997), and the Hans Neurath Award (2001). His influence extended to diverse facets of cellular and molecular biology, including the development of innovative techniques for protein folding studies, exploration of chaperone roles through biochemical and genetic avenues, investigation of disulfide bonds' impact through chemical modifications and mutagenesis, and editorial contributions to encyclopedias on molecular biology.

Creighton's literary repertoire boasts notable works:

"Proteins: Structures and Molecular Properties": A foundational tome elucidating the principles and concepts of protein chemistry, structure, and function. It serves as an enduring reference for those passionate about protein science. "Proteins: Structures and Molecular Properties": A comprehensive textbook, initially published in 1983 and revised in 1993, serves as an invaluable reference for students and researchers in biochemistry, biophysics, and molecular biology. It spans the spectrum of proteins, encompassing their biosynthesis, evolution, dynamics, ligand binding, catalysis, and structures.

"Protein Structure: A Practical Approach": A practical guide that outlines the methodologies and techniques for exploring protein structure. This resource touches upon various aspects, including protein purification, crystallization, spectroscopy, microscopy, modeling, and analysis, facilitating students and researchers in their endeavors. Initially published in 1990 and updated in 1997.



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"The Folding of Globular Proteins: A Progress Report": A review article encapsulating the progress, challenges, and mechanisms of protein folding. It delves into experimental methods, theoretical models, and the biological implications of protein folding research, highlighting the role of disulfide bonds, proline residues, and hydrophobic interactions. Published in 1988 in the journal of Biochemical Society Transactions.

"Experimental Studies of Protein Folding and Unfolding": A review article that scrutinizes the experimental approaches and outcomes of protein folding and unfolding investigations. It delves into the thermodynamics, kinetics, mechanisms, and factors affecting protein folding and unfolding. Published in 1979 in the journal Progress in Biophysics & Molecular Biology.

He has written a chapter of Book entitled Protein Folding Problems in Book: Mechanism of Protein Folding edited by R. H. Pain. This chapter is teaching for graduate students in Biophysics and Biochemistry at course: Special Topics in Physical Chemistry of Proteins at Institute of Biochemistry and Biophysics, University of Tehran.

References

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2. Books by Thomas E. Creighton (Author of Proteins) [Internet]. [cited 2023 Oct 17]. Available from: https://www.goodreads.com/author/list/141987.Thomas_E_Creighton

Kurt Wüthrich

Nobel Prize in Chemistry in 2002 in NMR of Proteins and Nucleic Acids

Prepared by R. Sattari

PhD student in Biophysics, University of Tehran, Iran



Kurt Wüthrich was born in Aarberg, Switzerland, on October 4, 1938. They were a group of seven students who specialized in natural sciences and were educated in mathematics and physics at university during their 14-18 years. In 1952, he began his formal training for an academic profession. Electron paramagnetic resonance (EPR spectroscopy) was part of his graduate studies starting in 1962 and continuing throughout [1]. In 1965-1967, he supplemented his postdoctoral training with nuclear magnetic resonance (NMR) spectroscopy for chemical physics projects, and since the fall of 1967, he has been using NMR for studies of biological macromolecules. The development of the NMR method for determining protein structure in solution in 1984 was a result of a sinuous pathway [2]. His interest was focused on metal centers rather than on polypeptide chains, and all his initial projects in high resolution NMR had to do with hemoproteins. He continued his research on hemoproteins using NMR and EPR spectroscopy. In addition, he started a systematic study program on the application of NMR techniques to polypeptides and small proteins [3]. In 1976, he started developing new NMR experiments and novel algorithms for the structural interpretation of NMR data, which eventually led to the NMR method for protein structure determination. The identification of

the nuclear Overhauser effect (NOE) as an NMR parameter that can be clearly connected to three-dimensional macromolecular structures was part of this. In 1977 the first 2D NMR spectrum of a protein was recorded, and by 1980 his group had assembled four 2D NMR experiments that were then used for the initial protein structure determinations: COSY (2D correlated spectroscopy), SECSY (2D spin-echo correlated spectroscopy), FOCYSY (2D fold over-corrected correlated spectroscopy) and NOESY (2D nuclear Overhauser enhancement spectroscopy) [1,4]. "NMR of Proteins and Nucleic Acids" covers primarily work in his research group during the period 1977-84. Finally, he was awarded half of the Nobel Prize in Chemistry in 2002 for "his development of nuclear magnetic resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution" [4].

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- 3) Keller RM, Wüthrich K. The electronic g-tensor in cytochrome b5: high resolution proton magnetic resonance studies. *Biochimica et Biophysica Acta (BBA)-Protein Structure*. 1972 Dec 28;285(2):326-36.
- 4) <https://www.nobelprize.org/prizes/chemistry/2002/wuthrich/biographical>



News

The 5th Conference in Protein and Peptide Science will be held at Institute of Biochemistry and Biophysics, University of Tehran on 8th and 9th May 2024.



پنجمین کنفرانس علوم پروتئینی و پپتیدی ایران
Iran's 5th Conference on Protein and Peptide Science
University of Tehran, 8 & 9 May 2024

واکنش تهران ۲۰۱۹ - اردیبهشت ماه ۱۴۰۳

محورهای کنفرانس:

- ۱- پپتیدهای فعال زیستی و کاربرد آنها در صنایع مختلف
- ۲- مهندسی پروتئین و آنزیم و کاربرد آنها
- ۳- پروتئین‌ها و بیماری‌های متابولیکی
- ۴- فولدینگ، پویایی ساختاری و پایداری پروتئین‌ها
- ۵- شیمی و فیزیک پروتئین‌ها و پپتیدها
- ۶- کاربرد پروتئین‌ها و آنزیم‌ها در حل مسائل مختلف زیستی
- ۷- پروتئومیکس و پپتیدومیکس
- ۸- بیومارکرهای پروتئینی و پپتیدی
- ۹- درمان‌های مبتنی بر پروتئین‌ها و پپتیدها
- ۱۰- برهمکنش دارو-پروتئین و پروتئین-پروتئین
- ۱۱- محاسبات کامپیوتری در تحقیقات پروتئینی
- ۱۲- طیف‌سنجی جرمی پروتئین‌ها و پپتیدها
- ۱۳- طیف‌سنجی NMR پروتئین‌ها و پپتیدها
- ۱۴- بلورشناسی پرتو ایکس پروتئین‌ها و پپتیدها
- ۱۵- واکسن‌های مبتنی بر پروتئین و پپتید
- ۱۶- بیومواد مبتنی بر پروتئین‌ها و پپتیدها
- ۱۷- نانوتکنولوژی پروتئین‌ها و پپتیدها
- ۱۸- نوآوری در روش‌های تخلیص و سنجش‌های کمی پروتئین

آخرین مهلت ارسال چکیده مقالات
۱۴۰۲/۱۲/۲۰ می باشد.

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شماره تماس: ۰۲۱۶۱۱۳۳۸۸۷-۰۹۱۳۱۶۱۲۸۸۷
دورنگار: ۰۲۱۶۶۰۴۶۸۰



New Conferences:



Protein Sciences
IN DRUG DISCOVERY
2024

ELRIG UK

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18 - 19 NOVEMBER
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More information: <https://elrig.org>



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+ 62nd Annual Meeting of the
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at the KYOTO INTERNATIONAL
CONFERENCE CENTRE

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(including IUPAB lectures),
25-30 Symposia,
500+ Posters.
Bursaries available

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Single-molecule biophysics
Biolmaging
Theoretical biophysics
De novo enzyme design
Machine learning in biophysics
LLPS/membrane-less organelle
Synthetic biology
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+ Hands-on Training Programs

Abstract submission & registration
from 1 Nov 2023;
<https://iupab.org/event/iupabcongress2024/>

More information: <https://iupab.org/event/iupabcongress2024/>



EMBO | EMBL 50 YEARS 1974-2024 Symposium

Cellular mechanisms driven by phase separation

14 – 17 May 2024 | EMBL Heidelberg and Virtual
#EESPhaseSeparation

More information:
s.embl.org/ees24-06



Organisers:
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Dresden University of Technology, Germany
Sara Cuylen-Häring
EMBL Heidelberg, Germany
Dorothee Dormann
Institute of Molecular Biology and Johannes Gutenberg University
Mainz, Germany
Alex Holehouse
Washington University in St. Louis, USA



More information: <https://www.embl.org>





EMBO WORKSHOP

Chemical biology 2024

9 – 12 September 2024
EMBL Heidelberg and Virtual

EMBO Workshop

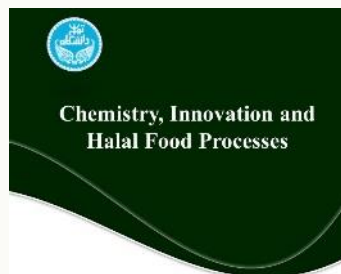
EMBO 50 YEARS 1974-2024

The banner features a blue and green background with molecular structures and chemical formulas. A white text box contains the event details. Logos for EMBO Workshop and EMBL 50 Years (1974-2024) are at the bottom.

More information: <https://www.embl.org>



New Books:



Authors:

Ali A. Moosavi-Movahedi
Maryam Moslehishad
Dina Alhooei
Maryam Salami

Book: Chemistry, Innovation and Halal Food Processes

Edited by: Ali A. Moosavi-Movahedi, M. Moslehi Shad, D. Alhooei, M. Salami

Publisher: University of Tehran Press

Language: Persian

ISBN: 978-964-03-7548-8

Published date: 2024

Today, with the increase in health concerns among the people of the world, the Halal food business has a high capacity. The concept of Halal indicates the health, cleanliness, and quality of consumed food, which improves the health of consumers. Therefore, knowing the science and knowledge of Halal products and the chemistry of Halal compounds are very important. The present book under the title "**Chemistry, Innovation and Halal Food Processes**" is the result of the research and experience of the authors, it was written in Persian language, which includes materials about science of Halal products, standards, how to obtain Halal logo certificate, the Chemistry of Halal compounds, Halal food products, laboratory methods for approving Halal products and the supply chain of Halal super food products.

This book can provide useful information to the producers of all kinds of Halal food products. By writing this book, a step will be taken to get familiar with the science of Halal food products, quality and health lifestyle, and the process of obtaining a Halal license.

The chapters of this book are as follows:

Business practices and trading of Halal products

The Halal standard and the procedures for issuing and receiving the Halal certificate

Halal and non-Halal additives

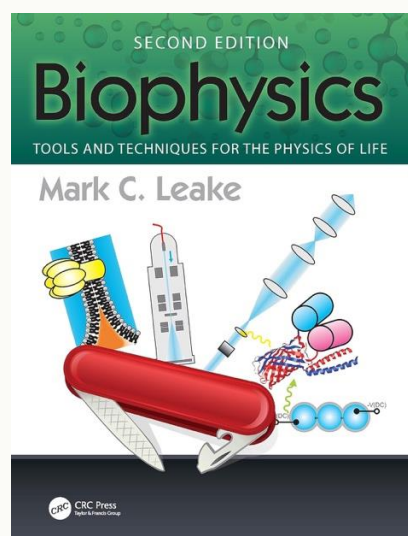
Fermented food products and Halal production process

Rules related to Halal slaughter and its effects on meat quality

Laboratory methods for approving Halal products

The supply chain of Halal food products

Today, Halal products are included under science and many books have been written about the science of Halal products at the international level, and various committees have been formed to review halal products in other countries, and each has its own Halal logo. Hope this book will answer part of the questions of students of food science and technology, biochemistry and food biophysics, and specialists, researchers and industrialists will benefit from it.

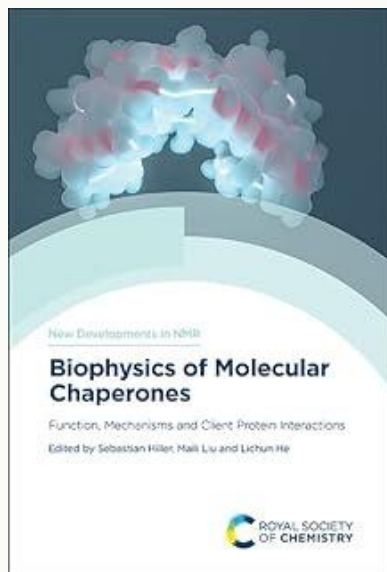


Biophysics: Tools and Techniques for the Physics of Life

By Mark C. Leake

<https://bookauthority.org>

Volume 19, Number 1



Biophysics of Molecular Chaperones: Function, Mechanisms and Client Protein Interactions

By: [Sebastian Hiller](#), [Maili Liu](#), [Lichun He](#)





As we embrace the arrival of spring, marking a renewal of nature and spirit, the Iran Society of Biophysical Chemistry extends its warmest wishes to all our members and their families. May this new year be filled with groundbreaking discoveries, prosperous collaborations, and immense personal and professional growth, Happy Nowruz



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