



ISOBC NEWSLETTER

Volume 13, Number 1



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Iran Society of Biophysical Chemistry



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Scientific reflections from scientists in the area of Biophysical Chemistry *Lars Onsager*

Theoretical physicist and physical chemist who was born at November 27, 1903 in Kristiania.



Lars Onsager is famous because receiving the Noble price of Chemistry in 1968 "for the finding of the reciprocal relations bearing his name, which are basic for the thermodynamics of irreversible processes". The main subjects that he was concern about them are "statistical mechanics" and "thermodynamics". He had positions at Johns Hopkins University, Brown University, Yale University and Miami University. He was talented at expanding theories. In 1925 he presented modification to the Debye-Hückel theory of electrolytic solutions, to specify Brownian movement of ions in solution. His working at Brown University was involved mainly with the effects on diffusion of temperature gradients, reulting into Onsager reciprocal relations, a set of equations published in 1929. Onsager, during the late 1930s studied the dipole theory of dielectrics and made improvements for another topic that had been studied by Peter Debye. In the 1940s, Onsager studied the statistical-mechanical theory of phase transitions in solids, deriving a mathematically elegant theory. He received the detailed solution for the two dimensional Ising model in zero field in 1944 and won the title of J. Willard Gibbs Professor of Theoretical Chemistry In 1945. He also did research on the theories of liquid crystals and the electrical attributes of ice. While on a Fulbright scholarship to the University of Cambridge, he did research on the magnetic attributes of metals. He expanded significant ideas on the quantization of magnetic flux in metals. Onsager wonthe Lorentz Medal in 1958, and the Willard Gibbs Award in 1962. In memory of the unique spirit of Lars Onsager and his passion for analytical results, Drs. Russell and Marian Donnelly endowed Lars Onsager price consists of \$10,000 as well as a certificate citing the contribution produced by the recipient in 1993 for recognizing outstanding research in theoretical statistical physics including the quantum fluids. He passed away on October 5, 1976, in Coral Gables, Florida, United States [1].

[1] From Nobel Lectures, Chemistry 1963-1970, Elsevier Publishing Company, Amsterdam, 1972. This autobiography/biography was written at the time of the award and first published in the book series Les Prix Nobel. It was later edited and republished in Nobel Lectures. To cite this document, always state the source as shown above.

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Biophysics week glorification

Physical scientists use mathematics to explain what happens in nature. Life scientists want to understand how biological systems work. These systems include molecules, cells, organisms, and ecosystems that are very complex. Biological research in the 21st century involves experiments that produce huge amounts of data. This is where biophysicists come in. Biophysicists are uniquely trained in the quantitative sciences of physics, mathematics and chemistry and they are able to tackle a wide array of topics, ranging from how nerve cells communicate, how plant cells capture light and transform it into energy, how changes in the DNA of healthy cells can trigger their transformation into cancer cells, and so many other biological problems.

Nowadays scientists in the field of Biophysics succeed to solve many challenges in the field of biology, using various knowledge fields such as Biochemistry, Nanotechnology, Neurobiology, Materials, Computational biology, Computer, Engineering and Systems biology.



Celebration of the World Biophysics Week **گرامیستانت هفته جهانی بیوفیزیک**
Institute of Biochemistry and Biophysics (IBB) University of Tehran
مرکز تحقیقات بیوشیمی و بیوفیزیک، دانشگاه تهران ۲۴-۲۱ اسفند ۱۳۹۶
Biophysics, promising solutions in Health, Pharmaceuticals, Agriculture and Environment

Programs:

- Lab tours**
Practical demonstration (Post and undergraduate students, member of academics, Experts in governmental and private sectors)
- National and world achievements of Biophysics**
 - Discoveries
 - Inventions
 - Problem solving
 - Targeted horizons
 - Interdisciplinary/integrative approach
- Biophysics debate**
(Education, Research, Collaboration, Spin-of-companies)
- Scientific Excursions**
 - Basir Eye Health Research Center
 - University of Tehran, Science and Technology Park
 - National Brain Mapping Lab
 - Aerospace Research Center

Registration fee: 400000 IRR
Program details: <http://www.ibb.ut.ac.ir>

مهرت ثبت نام برای حضور رایگان همه ۱۲ اسفند ۱۳۹۶
Shahram.jezani@ut.ac.ir, Tel: 61113375

Biophysical world society, by organizing many seminars and workshops in Biophysics week in all over the world has tried to introduce biophysics and its applications to various branches of biology for all people from 2016. Institute of Biochemistry and Biophysics, University of Tehran, simultaneous to this event, is organizing a series of meetings and presentations related to this event between 12-16 March 2018.

It's worth mentioning that Iran Society of Biophysical chemistry (ISOBC) appreciates this event and supports this ceremony and appreciates all researchers in the field of biophysics who works to advance this field in integration with other scientific discipline.

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The plenary and keynote featured speakers of

The 3th conference of “peptide and protein science” In Shiraz, Iran



Professor Robert Huber, one of the plenary and keynote featured speakers of **The 3rd Conference on Protein & Peptide Sciences**, 25-26 April 2018, Shiraz, Iran, was the winner of the Nobel Prize in Chemistry in 1988. His prize motivation was for “the determination of the three-dimensional structure of a photosynthetic reaction center”. He has awarded more than 50



honors till now. At the moment his research interest is “Preparation, crystallization and structural analysis of proteins; development of experimental and theoretical methods for crystal structure determination of macromolecules”. He works at “Max-Planck-Institute für Biochemie” and has 1220 publications. He is one of the editors of “Journal of Molecular Biology”.

More information: <http://pps3.shirazu.ac.ir/>

https://www.nobelprize.org/nobel_prizes/chemistry/laureates/1988/huber-facts.html

<http://www.biochem.mpg.de/en/eg/huber>





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New International Conferences:

The 3rd Conference on Protein & Peptide Sciences

25-26 April 2018, Shiraz, Iran



More information: <http://pps3.shirazu.ac.ir/>



2018 International Exhibition on Surfactant & Detergent

Date: Apr.24-26, 2018

***Venue: Shanghai Convention & Exhibition Center of
International Sourcing, China***



More information: <http://www.iesdexpo.com>

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ISANH Middle East and Amman Antioxidants World Congress 2018



More information: <https://www.isanh-me.com/>



The 12th European Symposium on Thermal Analysis & Calorimetry (ESTAC12)



More information: <http://estac12.org/>



20th National &
8th International
Congress on Biology,
University of Maragheh, Iran,
22-24 Aug, 2018



More information: http://congress.ibs.org.ir/index.php?slc_lang=en&sid=1

Biophysicist in Profile

Vahid Sheikh-Hasani, PhD in Biophysics

ISOBC Member



Please introduce yourself as an ISOBC member.

I am graduated from Mohagheghe Ardabili University (UMA) with a BSc in General Biology, 2009, from Institute for advanced studies in basic sciences (IASBS), Zanjan, Iran, with a MSc in Biophysics, 2012. I received Ph.D. in Biophysics from University of Tehran, Tehran, Iran during the period of 2012-2017. Currently I am working in the area of single cell and molecule force measurements using optical tweezers. My second interest of study is molecular dynamics simulations of protein aggregation/disaggregation and protein folding pathways.

What was your dissertation topic?

My PhD dissertation topic was “Mechanical study of direct effects of statins family of drugs on single red blood cell deformability using optical tweezers”

What are some of your latest biophysical achievements?

As a part of a great molecular dynamics simulations project in 2010 we have proposed a mechanism for aggregation of short length peptides with specific sequence including charged and non-polar amino acid residues.

During my PhD, as the first report published in literature, I have studied the direct effect of statin drugs on mechanical behaviour of red blood cells. This study was done using single cell force measurement technique. Precious force measurements was done using optical tweezers and a new aspects of mechanical behaviour of red blood cells was demonstrated.

Please explain about your membership in ISOBC.

ISOBC has a dynamic scientific atmosphere. This provoked me to join this great community. This was a starting point for me to share my new experiences with expert researchers in the field of Biophysical and Biochemical sciences.

