



# ISOBC NEWSLETTER

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## ISOBC Newsletter

September / 2009

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Iran Society of Biophysical Chemistry



## *About Interactomics*

Interactomics is the omics study of interaction network, especially in biology.

Interactomics is a fusion science of biology, informatics, and engineering. It uses various experimental techniques to determine molecular and cellular level interactions to produce usually a large quantity of information. Bioinformatics is used to analyze the data and information to produce more meaningful information and knowledge.

source: [http://interactomics.org/index.php/About\\_Interactomics](http://interactomics.org/index.php/About_Interactomics)

### ➤ *What is omics*

Definition of Omics:

Omics is a general term for a broad discipline of science and engineering for analyzing the interactions of biological information objects in various omes. These include genome, proteome, metabolome, expressome, and interactome. The main focus is on 1) mapping information objects such as genes, proteins, and ligands, 2) finding interaction relationships among the objects, 3) engineering the networks and objects to understand and manipulate the regulatory mechanisms, and 4) integrating various omes and omics subfields.

### *An older definition of omics*

A new biological research paradigm to produce knowledge en masse from the networks of information objects in holistic principles and methods deviating from reductionism.

Source: From Omics.org

### *What is difference between Omics, Systems biology and Bioinformatics?*

The study of "-omics" is often regarded as the same as "systems-biology", although the relationship between the two is like the relationship between "computational biology" and "bioinformatics". One is a much more detailed and specialized subset of the other. While the basic principles and ethos of "systems-biology" are correct, "-omics" takes a much broader and more philosophical perspective.

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Modern uses of the term "omics" derive from the term genome (hence genomics), a term invented by Hans Winkler in 1920, although the use of -ome is older, signifying the "collectivity" of a set of things. The oldest of these terms, and one that seems due to come back into fashion, may be biome. Thus, although the explosion in the use of this terminology may appear fatuous, it does signify a widespread interest in moving toward an integrative, rather than reductionist, approach to biology, following from the early successes of genomics and functional genomics.

Source : [http://omics.org/index.php/What\\_is\\_omics](http://omics.org/index.php/What_is_omics)

Alphabetically ordered list of omes and omics can search from below website:  
[http://omics.org/index.php/Alphabetically\\_ordered\\_list\\_of\\_omes\\_and\\_omics](http://omics.org/index.php/Alphabetically_ordered_list_of_omes_and_omics)

### ➤ **Ahmed Zewail Prize in Molecular Sciences**

After our recent announcement of the second Ahmed Zewail Prize in Molecular Sciences the ACS Spring National Meeting in Salt Lake City, the Chief Editors and Elsevier, the Publisher of Chemical Physics Letters would like to take this opportunity to send you a few impressions of the award ceremony.





### News

#### ➤ *Iranian Journals Prosperities*

Journal of the Iranian Chemical Society (JICS) obtained impact factor >2 in year 2008.

Please see the web site: [www.ics-ir.org/jics](http://www.ics-ir.org/jics)

#### ➤ *Iran NanoTechnology Initiative Council patent support*

Iran Nanotechnology Initiative Council (INIC) provides financial support for research projects, patents, and equipment of laboratories which are active in nanotechnology. Under its new supportive regulations, the council also pays more than 80% of the costs of patenting in America and Europe to the researchers. For more information please see the website at:

[www.nano.ir/IP/index.php?pid=8](http://www.nano.ir/IP/index.php?pid=8)

#### ➤ *The Protein Society's 2010 Awards*

The Protein Society is seeking nominations for the 2010 Society Awards. All awards will be presented at the 24th Annual Symposium of The Protein Society in San Diego, California, August 1-5, 2010. Only complete nomination packages will be considered for judging – and will be accepted no later than October 1, 2009. All nominees must be living at the time of an award nomination.

To submit a nomination, please visit the Society website:

<http://www.proteinsociety.org/pages/page03c.htm>

#### ➤ *International Award*

Dr. Addeleh Divsalar has been awarded as 21st IUBMB International Congress and 12th FAOBMB Congress of Biochemistry and Molecular Biology Young Scientist, Shanghai, China, August 2 - 7, 2009. She is an ISOBC member and already she has a postdoctoral position at Institute of Biochemistry and Biophysics (IBB).

## ***Abstracts from three PhD's thesis and their achievements***



Seyed Jafar Mousavy  
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S.J. Mousavy is PhD student in Biochemistry and started his thesis 3 years ago. The title of his thesis entitled " Effects of mobile phone radiofrequency on the structure and function of the normal and beta thalassemia human hemoglobin ".The aim of definition of this thesis is the elucidation of the effect and damages of mobile phone radiofrequency on life system. The below short report is part of the research achievements from this thesis and published in International Journal of Biological Macromolecules 2009.

Extraordinary production and use of mobile phones has increased health risk in the world. It is required to investigate the effect of EMFs of this device on the biological systems. As a PhD student in Institute of Biochemistry and Biophysic (IBB) of Tehran University, I chosen title of "Effects of mobile phone radiofrequency on the structure and function of the normal and beta thalassemia human hemoglobin". In this thesis, we studied the effect of mobile phone radiofrequency (RF) on structure and function of normal human hemoglobin (HbA) and beta-thalassemia hemoglobin (HbThl). Our findings indicate that mobile phone radiofrequency decrease oxygen affinity of both hemoglobins. The effect of mobile phone on function of hemoglobin was increased by increasing of field intensity and time of mobile phone usage. Structural studies of effect of mobile phone on these hemoglobins were indicated that conformation of proteins changed significantly. But exposing of beta thalassemia hemoglobin in frequency of 910 MHz with 108.4V/m intensity was showed significant change in secondary structure. This finding showed that effect of EM fields of mobile phone on secondary structure of protein depends on not only to the frequency but also on field intensity. Structural and functional studies of exposed and unexposed HbA were indicated that effects of EM of mobile phone were significantly reversible. But results of structural studies of HbThl were indicated that the effect of mobile phone were irreversible process.

References:Mousavy SJ, et al. [Effects of mobile phone radiofrequency on the structure and function of the normal human hemoglobin](#). Int J Biol Macromol. 44(2009) 278-85.



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M.Salami is PhD student in Food Biotechnology and started her thesis 2 years ago. The title of her thesis entitled "Bioactive Peptide Production and Fractionation from Hydrolysis of Camel Milk Proteins ". Camel is a high-tech animal and therefore the aim of definition of this thesis are to investigate the bioactivity and functional properties of camel milk protein and peptides. The below short report is part of the research achievements from this thesis and published in International Dairy Journal 2008 and 2009.

Milk proteins exert a wide range of nutritional, functional and biological activities. Many milk proteins possess specific biological properties that make these components potential ingredients of health-promoting foods. Increasing attention is being focused on physiologically active peptides derived from milk proteins. Milk protein derived peptides have different functionality including antioxidant activity, antimicrobial activity and blood pressure-lowering effect. Most of the studies on the bioactive peptides have been done on bovine's milk proteins, but bovine's milk allergy is by far the most prevalent food allergy especially in children because of  $\beta$ -lactoglobulin is considered. Camel milk lacks this protein and is enriched with  $\alpha$ -Lactalbumin such as human milk. Its composition is closer to human milk than bovine's milk is. The digestibility of camel milk protein as well the bioactivity of peptides produced from camel casein and whey proteins were studied. The degree of hydrolysis (DH) of camel  $\alpha$ -La by either trypsin or chymotrypsin was noticeably higher than bovine's protein counterpart. Caseins (CNs) were more rapidly hydrolyzed than whey proteins (WPs) because of their greater flexibility and open structures. Not only camel milk proteins have higher functionality than bovine milk proteins but also the bioactive peptide derived from camel milk protein showed higher functionality including antioxidant activity and antimicrobial activity comparing to bovine. Considering the health effect of camel milk proteins and its bioactive peptides, it could be the 'super food' of the future.

### References:

Salami, M., et al. Kinetic characterization of hydrolysis of camel and bovine milk proteins by pancreatic enzymes, *International Dairy Journal*, 18, 1097-1102, 2008.

Salami, M., et al. Enzymatic digestion and antioxidant activity of native and MG state of camel  $\alpha$ -Lactalbumin: possible use in infant formula, *International Dairy Journal*, 19, 518-52, 2009.

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Jalil badraghi  
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Jalil badraghi is PhD student in Biophysics and started his thesis 3 years ago. The title of his thesis entitled "Comparative structural and chaperone studies on phosphorylated and dephosphorylated  $\alpha$ 1-caseins from camel and bovine milks". The aim of this thesis is to investigate the characterizations of camel  $\alpha$ 1-casein ( $\alpha$ 1-CN) as well as their potential in prevention of aggregation of insulin as an amyloidogenic protein. The results obtained in this thesis may introduce  $\alpha$ 1-CN as a very useful tool in fighting of different amyloid disorders such as Alzheimer's on life system. The below short report is part of the research achievements from this thesis and published in Colloids and Surfaces B: Biointerfaces 2009

More than 20 different diseases are caused at least partially by abnormal protein aggregation, which may result from mutations and physical or chemical changes of cellular environment. Its prevention or even moderate inhibition has been mostly experimental. Therefore, achieving a better understanding of effective parameters on chaperone ability of protein is critical in finding a solution to those devastating diseases.

In this study camel  $\alpha$ 1-casein ( $\alpha$ 1-CN) was purified, and the chaperone ability of the purified protein sample was examined in a presence of different salts and 40 $\mu$ M concentration of SDS. Insulin aggregation (88  $\mu$ M) performed chemically in the presence of 20 mM dithiothreitol (DTT) in 10 mM sodium phosphate buffer, pH 7.0. The aggregation of insulin was monitored at 360 nm in a Cary 100 UV-vis spectrophotometer equipped with Le Peltier temperature controller. Our findings indicate that the salts neutralize the chaperone-like activity of casein due to dehydration effect and the increased association and aggregation of proteins. SDS in final concentrations of 40  $\mu$ M enhanced camel  $\alpha$ 1-CN chaperone-like properties, due to the binding of the hydrophobic tail of SDS and  $\alpha$ 1-CN to the exposed hydrophobic sites of insulin strongly preventing aggregation of insulin.

### References:

Badraghi J, et al. [Effect of salts and sodium dodecyl sulfate on chaperone activity of camel  \$\alpha\$ 1-CN: Insulin as the target protein.](#) Colloids and Surfaces B: Biointerfaces 71 (2009) 300–305

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## *New Conferences*

- **10th Iranian Congress of Biochemistry & 3rd International Congress of Biochemistry and Molecular Biology Conference [10th ICB & 3rd ICBMB]**

The new date of the congress has been announced as follows:  
"16-19 of NOVEMBER 2009 which translates to 25-28 of ABAN 1388"  
The new daily program will be uploaded into the site of the congress in a  
**few days.**

For more information please visit: / <http://www.biochemiran.com/congress10>

- **20th Anniversary World Congress on Biosensors  
Glasgow, UK | 26-28 May 2010**



**ABSTRACT SUBMISSION DEADLINE - 30 OCTOBER 2009**

Submit abstracts now at:

[www.biosensors-congress.elsevier.com](http://www.biosensors-congress.elsevier.com)

- **15th International Cyclodextrin Symposium**

**May 9 - 12, 2010**

**Vienna, Austria**

Web site: <http://www.cyclodextrin.at>



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2009

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**14th International Biotechnology Symposium and Exhibition**

**15-19 September 2010 | Palacongressi, Rimini, Italy**



Please see [www.ibs2010.org](http://www.ibs2010.org)

➤ **3rd International Joint Conference on Biomedical Engineering Systems and Technologies - BIOSTEC 2010**

Web site: <http://www.biostec.org>

January 20 - 23, 2010

Valencia, Spain

➤ **Second International Conference on Polymer Processing and Characterization (ICPPC – 2010): January 15, 16 and 17, 2010, Kottayam, Kerala, India**

**EMBO Conference-The Physical of Cells**

Dubrovnik, Croatia

September 6-13, 2009

<http://www.conference-service.com/cfs09-04/welcome.cgi>



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**10th international Summer School on Biophysics**

**Rovinj, Croatia**

**September 19 – November 1, 2009**

<http://www.irb.hr/biophysics>

**2nd Conference on BioMedical Engineering and Informatics**

**Tianjin, China**

**October 17-19, 2009**

<http://www.tjut.edu.cn/cisp-bmeri2009>

**16th EBEC - European Bioenergetics Conference,  
17-22 July 2010,**

**in Warsaw, Poland**

[European Calcium Society](#)

**ECS**

**5-8 September 2010,**

**in Warsaw, Poland**



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➤ **The 4th Int'l Conf. on Bioinformatics and Biomedical Engineering**

**(iCBBE 2010)**

June 18-20, 2010 Chengdu, China

Submission Deadline: Oct. 30, 2010

Conference Website: <http://www.icbbe.org/2010>

Contact: [submit@icbbe.org](mailto:submit@icbbe.org)

➤ **The Int'l Conf. on Environmental Pollution and Public Health (EPPH2010)**

June 21-23, 2010 Chengdu, China

Submission Deadline: Oct. 30, 2009

Conference Website: <http://www.icbbe.org/epph2010>

Contact: [epph@icbbe.org](mailto:epph@icbbe.org)

**Synthetic Biology in Pharma**

2010 March 30-31, 2010 ,Cambridge, UK.

Email: [info@synthetic-biology.info](mailto:info@synthetic-biology.info)

Web: [www.synthetic-biology.info](http://www.synthetic-biology.info)



## ➤ *New Books*

### Advanced Series In Physical Chemistry

#### Conical Intersections

Electronic Structure, Dynamics and Spectroscopy

edited by Wolfgang Domcke (Technical University of Munich, Germany), David R Yarkony (John Hopkins University, USA) & Horst Köppel (University of Heidelberg, Germany)

*Recent Advances in Polymer Nanocomposites*

Editors: S. Thomas, G.E. Zaikov and S.V. Valsaraj

See web site address: <http://www.brill.nl/default.aspx?partid=210&pid=30549>

*Progress in Polymers Nanocomposites Research*

Editors: Sabu Thomas, Gennady E. Zaikov

See web site address: <http://www.novapublishers.com>

*Polymer Nanocomposite Research Advances*

Editors: Sabu Thomas, Gennady E. Zaikov

See web site address: <http://www.novapublishers.com>

*Micro-and Nanostructured Multiphase Polymer Blend Systems*

Editors: Charef Harrats, Sabu Thomas, Gabriel Groeninckx

See web site address: <http://www.taylorandfrancis.com>

CRC press web site address: <http://www.crcpress.com>

## **HANDBOOK OF PORPHYRIN SCIENCE**

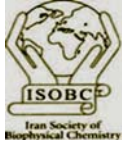
*With applications to Chemistry, Physics, Materials Science, Engineering, Biology and Medicine*

*Karl M Kadish*

*Kevin M Smith*

*Roger Guilard*

See web site address: [WWW.Worldscientific.com](http://WWW.Worldscientific.com)



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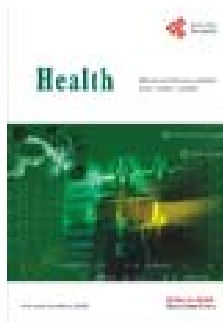
## ➤ *Free Online Access Journals*



### [Journal of Biomedical Science and Engineering \(JBiSE\)](#)

Website: <http://www.scirp.org/journal/jbise>

Contact: [jbise@scirp.org](mailto:jbise@scirp.org)



### [Health \(Health\)](#)

Website: <http://www.scirp.org/journal/health>

Contact: [health@scirp.org](mailto:health@scirp.org)

## ➤ *Interview*

Dr. Parandis Daneshgar is a postdoctoral researcher at Institute of Biochemistry and Biophysics, University of Tehran, Tehran, Iran. She joined to Prof. Moosavi-Movahedi's research group at IBB three years ago. Here is an interview with Dr. Daneshgar:



- Please tell us about yourself:

I was born on June, 06, 1977 in Mazandaran, Iran. I got my degrees as: B.Sc. in Pure Chemistry, Guilan University, Guilan, Iran, September, 2001, M.Sc.: in Analytical Chemistry: Tabriz University, Tabriz, Iran, July, 2004, Ph.D.: in Bioelectrochemistry: University of Tehran, Tehran, Iran, April, 2009.

My research activity in B.Sc. was on the modification of glassy Carbon electrode by organic compound Papaverolin for determination of some biological compound such as ascorbic acid and NADH and poisons such as hydrazine by supervision of Professor Golabi. I focused on the modified electrodes by nano-structures and fast Fourier transform Voltammetry in Ph.D. and at the same time, I involved on the electrochemical investigation of interactions of protein (normal and glycosylated human serum albumin) with drugs. It is a pioneering work in the electrochemical area to help diabetic person use drugs and for the physicians to attend about the dosage of drugs for normal and diabetic persons.

During the time span of my PhD, I have had some teaching experiences in undergraduate and levels (such as: analytical chemistry, special topics in electrochemistry, etc) and was a cooperative to advice some B.Sc. students in electrochemical study. I have also involved on two research proposals.

My research interests revolve around the major area of interdisciplinary areas such as nanoscience and bioelectrochemistry. I apply nanostructure materials in the electrochemistry of DNA, proteins and enzymes and electroanalysis and electrochemical biosensors. I basically engaged in various voltammetric methods, surface scanning and scanning probe microscopies and spectroscopic methods for completion my results. Recently, I have synthesized and applied nanostructured materials in bioelectroanalysis and biosensor design. Along this line, I started with employment of nanotubes of carbon to the



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electrochemical studies and electroanalysis of drugs. I tried to synthesis of some new nanostructured materials (such as: nanoparticles, nanowires, quantum dots, etc) and explore the size- and shape-dependency of electrochemical kinetics and thermodynamics in the course of heterogeneous electron transport processes from/into biologically active compounds and use of them for modification in determination of some components such as drugs. For examples, I have found that rare earth metal nanowire are good material for modification of carbon paste electrode which make higher electrochemical reactivity compared to the unmodified electrode for determination of drugs and so we get more sensitive and reproducible sensor in determination of drugs. Furthermore, for the first time, it has been distinguished the Agnano/DNA electrode as a biosensor for determination of drugs and biological compounds. I enjoy the research on nanoworld. There is very huge space at the nanoword which able us to real our dreams and it is so amazing. I have set up an advanced research line based on synthesis of nanostructured materials using biomacromolecules as biomimicking soft templates and will start the synthesis and applications of such nature-induced synthetic nanomaterials.

Up to now, I have had 20 international published papers, 3 submitted papers, and 6 full/abstract papers presented in national and international conferences and seminars.

- What is your view about IBB?

I have started my work with professor Moosavi-Movahedi about 4 years ago and I have feel the most smooth and inconvenience-free medium in the Prof. Moosavi-Movahedi's research group, compare to all my previous experiences. I really enjoyed of working with them and appreciate of his help and advice.

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