



ISOBC NEWSLETTER



Iran Society of Biophysical Chemistry

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Mentors and Mentees

Three-Dimensional Domain Swapping	2
Natively Unfolded Proteins	2
Research Looks into Cold, Salt Intolerant Plant	2
Vitamin C also Helps Plants, Research Shows	3
The Power of God	3
FAO Reports on Worldwide GM Tree Efforts	3
Tomato Gets Nutrient Boost	4
Triple Sunset: Planet Discovered in 3-Star System	4
Journal of the Iranian Chemical Society	4
The Scientific Impact of Nations	4
New Books and Journals	5
Upcoming Meetings and Congresses	6

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The students need capable and educated teachers in order to develop scientifically and spiritually so that they may learn methods of acquiring knowledge as well as promote their ethical and human values and virtues. Such teachers or mentors are, in fact, learned, profound leaders who function as a guiding beacon developing learners into a multi-functional character equipped with both state-of-the art sciences and a dignified, refined

personality and hence useful for the society. These mentors open up various horizons to their learners when dealing with a single phenomenon. As a result, instead of being a narrow-minded novice, these learners enjoy having a rich experience, induced by their experienced mentors.

Mentors not only develop their students' potentialities, but also strengthen them against scientific, cultural and other forms of invasion and coloni-

alism. In turn, these well - developed human beings will later illuminate their surrounding environment.

Today, students desperately need such mentors to actualize all their capabilities in order to meet human needs through their knowledge management and organize an exalted society.

A.A. Moosavi- Movahedi
M. Amani
A. Kiani-Bakhtiari

Publication is the gem of science; Imam Ali

About The ISOBC NEWSLETTER

It is our pleasure to introduce the ISOBC newsletter, which intends to be an informative publication highlighting the important news, mainly of the ISOBC members. It will also contain short precepts of interesting scientific articles, information about new books, and some of the scientific meetings and congresses all around the globe. It might as well serve to introduce some of the companies that provide especially unique services to research laboratories. We would like to take the opportunity to invite all the members to share their news and views with other members of the society by sending them as 100-250 word type written texts to news@isobc.org. This could be a summary of an

outstanding paper you read (along with its complete address), or an advertisement, or even an interesting discovery you might have made in your own laboratory; or simply an opinion about the newsletter, about your work, about IBB; it can be a poem, a picture, a cartoon or any other talents you may be gifted with as an individual.

Reading of the newsletter and contribution to it should also be an invaluable way of improving English language skills.

Again we hope you'll find the newsletter useful, and we look forward to your participation in making all kinds of improvements.

Ibn Sina Award for Scientist with Good Manners

ISOBC is proud to announce that the Islamic Republic of Iran in collaboration with UNESCO have jointly established the **Ibn Sina award** to be presented on a yearly basis, by the UNESCO to a scientist who, has gained proficiency in not just his or her scientific filed of specialty but in the area of ethical and mannerly treatments of other human beings, including colleagues, students etc. Thanks to the ten years long efforts of the head of the Institute of Biochemistry and Biophysics (IBB) of the University of Tehran for such arrangements

Three-Dimensional Domain Swapping

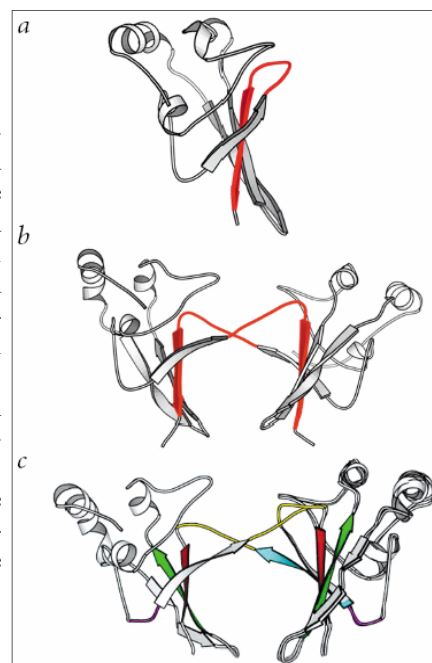
Three-dimensional domain swapping is the process by which one protein molecule exchanges a domain with an identical partner. The swapped 'domain' can be a single element of secondary structure or an entire tertiary globular domain. The subunits of the resulting oligomer generally have the same structure as the monomer, except in the so-called 'hinge loop' connecting the exchanging subunit with the rest of the protein and any new interfaces that may form between the subunits in the oligomer. Because no new intermolecular interface is introduced in domain-swapped dimeric suppressor of cyclin dependent kinase 1 (suc1) as compared to monomeric suc1, the presence of this form could be explained solely by conformational

changes originating in the hinge loop.

The picture shows a schematic representation of the suc1 structures. *a*, Monomer and *b*, domain-swapped dimer with the hinge loop and the exchanging β -strand 4 indicated in red. Suc1 has a four-stranded antiparallel β -sheet that packs against three α -helices and two long loops³. *c*, Superposition of monomer and dimer shows the extent of structural identity.

The domain-swapped dimer results from exchange of an inner β -strand, β_4 , by opening up a turn (the 'hinge loop') between β_3 and β_4 . Monomer and dimer structures are highly superimposable, as judged by a number of different parameters, except for the hinge loop.

Nature structural biology, vol. 8, Oct 2001



Natively Unfolded Proteins

Anthony L. Fink, in his article entitled as above, and published in *Current Opinions in Structural Biology* 2005, 15:35-41, describes that in addition to proteins that have well defined globular structures, some actively functional proteins, present in all species, lack ordered structures. They are called "disordered proteins" and their proportions increase with complexity of the organism, to as much as 33% in eukaryotes. These "natively unfolded" or "intrinsically unstructured"

proteins, per se, may be recognized as a separate category of proteins structure, in the near future. Most of these proteins function by interacting with a partner ligand, such as chaperons, other proteins, DNA or membranes. Such interactions induce folding of the initially disordered structure. The unfolded nature helps these proteins to have large intermolecular interfaces in spite of being small in size, thus requiring small genome and helping to keep normal cell size.

Other advantages conferred on such proteins by the intrinsic lack of structure may include ability to bind several different ligands, facilitation of rapid turnover, and rapid regulation of their concentration in response to stimulations through rapid transformations from order to disorder, and vice versa.

The occurrence of disorder is low in proteins involved in metabolism and biosynthesis, but high in protein kinases.

Current Opinions in Structural Biology 2005, 15:35-41.

Research Looks into Cold, Salt Intolerant Plant

Jianhua Zhu of Purdue University, USA found out that "HOS10 encodes an R2R3-type MYB transcription factor essential for cold acclimation in plants." The research reports the identification and characterization of an Arabidopsis mutant extremely sensitive to freezing temperatures and sodium chloride levels due to the mutation of a gene,

and is published in the latest issue of the Proceedings of the National Academy of Sciences online.

Plant metabolism is highly complex, and still not completely understood. For instance, evidence indicates that metabolic pathways can cross each other and affect one another when pathways controlling drought, salinity, and

cold tolerance are concerned. Through RNA gel analysis, cloning of the HOS10 gene, mutation of the gene, and identification of the HOS10 locus, among other things, researchers produced plants which were reduced in size, flowered early, and yet had reduced fertility. These HOS10 mutants, moreover, could not survive in cold and

high salt conditions, and could not synthesize an important hormone.

This mutation, researchers said, could prove useful in further studies involving connections between cold or salt tolerance, and plant metabolism. Download the complete article at <http://www.pnas.org/cgi/reprint/102/28/9966>.

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Vitamin C Also Helps Plants, Research Shows

In "Increasing Tolerance to Ozone by Elevating Foliar Ascorbic Acid Confers Greater Protection Against Ozone Than Increasing Avoidance," Daniel Gallie and Zhong Chen of the University of California, Riverside show that Vitamin C can help plants defend themselves against the destructive effects of ozone. Their findings are published in the latest issue of *Plant Physiology*. Atmospheric oxygen, though beneficial for most living organisms, can be degraded to

ozone. Exposure to ozone, in the case of plants, results in impaired photosynthesis, reduced growth, and an accelerated onset of senescence in plants. In the research, the authors increased the vitamin level in leaves by manipulating dehydroascorbate reductase (DHAR), a naturally occurring enzyme that recycles vitamin C. Using transgenic tobacco exposed to varying levels of ozone, the researchers showed that the change also reduced the harmful effects of ozone on plants, such

as brown spots, slower plant growth, and lowered crop yields. Moreover, after enzyme assays and measurement of stomatal size in transgenic plants, among other protocols for measuring the effects of ozone on plant growth and metabolism, they found that DHAR-overexpression allowed plants to have higher levels of chlorophyll, and a higher level of photosynthetic activity. Read more at <http://www.plantphysiol.org/cgi/content/full/138/3/1673>

Creativity is God's gift to you. What you do with it is your gift to God.

Wisdom is the reward you get for a lifetime of listening when you'd have preferred to talk.

Allah merges the night into the day and merges the day into the night.

(The picture shows night and day side by side.)



Before you speak, ask yourself, is it kind, is it necessary, is it true, does it improve on the silence?

FAO Reports on Worldwide GM Tree Efforts



Forest farm in Huairou District outside Beijing, China

A new global study of biotechnology in forestry conducted by the Food and Agriculture Organization (FAO) revealed that about 70 percent

of forest biotechnology activities is taking place in developing countries. India and China are the most active players in the developing world. Of the over 2700 biotechnology activities reported worldwide over the past 10 years, genetic modification accounts for around 19 percent only. FAO reported that overall, genetic modification activities in forestry are taking place in at least 35 countries, with the vast majority at the laboratory stage, with some supporting field trials.

The study also noted that more than 210 field trials of genetically modified (GM) trees are currently under way in 16 countries. Most of the trials which are largely on *Populus*, *Pinus*, *Liquidambar* and *Eucalyptus*, are being conducted in the US. Only China has reported the commercial release of GM trees: around 1.4 million plants on 300-500 hectares in 2002. Read more on the FAO study at <http://www.fao.org>.

To be without some of the things you want is an indispensable part of happiness.

Tomato Gets Nutrient Boost

In the latest issue of Nature Biotechnology, Ganga Rao Davuluri of Stazione Zoologica, Naples, Italy, and colleagues demonstrate that "Fruit-specific RNAi-mediated suppression of DET1 enhances carotenoid and flavonoid content in tomatoes." The research shows new work on raising the levels of nutritious compounds in tomato through the use of inverted repeat RNA interference (RNAi) constructs under the control of fruit-specific promoters – and through the control of a single gene.

The gene in question is DET1, which codes for a transcription factor first identified in *Arabidopsis*. DET1 mutants can grow in the dark, as though the plants were exposed to light. Researchers were able to engineer tomato plants in such a way that DET1 would be suppressed by RNA interference, but would not result in any other disruption of plant metabolism or growth. After testing the fruits for nutrient content, re-



searchers found that both [lycopene](#) and beta [carotene](#) were present at higher levels than in wild-type fruits. Other nutrients were also increased, including chlorogenic acid and naringenin-chalcone. All the increased nutrients have been shown to be potent antioxidants in previous studies.

The findings of the research may prove to be highly beneficial to both consumers and the food industry. First, the transgene and the constructs created are of host plant origin, the gene in question has natural mutants, and the modifications on the plant do not result in lower yield.

Download the journal article at <http://www.nature.com/nbt/journal/v23/n7/pdf/nbt1108.pdf>, and the news at <http://www.nature.com/nbt/journal/v23/n7/pdf/nbt0705-825.pdf>

Triple Sunset: Planet Discovered in 3-Star System

A newly discovered planet has bountiful sunshine, with not one, not two, but three suns glowing in its sky. It is the first extrasolar planet found in a system with three stars. How a planet was born amidst these competing gravitational forces will be a challenge for [planet formation theories](#).

"The environment in which this planet exists is quite spec-

tacular," said Maciej Konacki from the California Institute of Technology. "With three suns, the sky view must be out of this world -- literally and figuratively."

The triple-star system, HD 188753, is located 149 light-years away in the constellation Cygnus. The primary star is like our Sun, weighing 1.06 solar masses. The other two stars form a tightly bound



By [Michael Schirber](#).
At www.Space.com

pair, which is separated from the primary by approximately the Sun-Saturn distance.

The Scientific Impact of Nations

In his article published in Nature, Vol. 430, July 2004, David A. King has analyzed the numbers of published research papers and reviews, and their citations in order to measure the quantity of science in different nations.

In this article he places Iran among the 31 countries that account for more than 98% of the world's highly cited papers, the so-called "top 1% most cited publications". Although Iran is the last and the 31st country in the list, it is the only representative of Islamic countries despite the high GDP (gross domestic product) of many Islamic nations and the prominence of some individuals, such as Nobel prizewinners Abdus Salam and Ahmed Zewail. He notes that sustainable economic development requires direct engagement in the generation of knowledge..., and that the cycles of poverty and dependence can only be broken by capacity-building between nations of high and low science intensity.

Journal of the Iranian Chemical Society

Journal of the Iranian Chemical Society (JICS) welcomes high quality original papers in English dealing with experimental, theoretical and applied research related to all branches of chemistry. These include the fields of analytical, inorganic, organic and physical chemistry as well as the chemical biology area. Review articles discussing specific areas of chemistry of current chemical or biological importance are also published. Journal of the

Iranian Chemical Society ensures visibility of your research results to a worldwide audience in science. You are kindly invited to submit your manuscript to the Editor-in-Chief or your Regional Editor. All contributions in the form of original papers or short communications will be peer reviewed and published free of charge after acceptance.

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www.ics-ir.org/jics

Protein-Protein Interactions

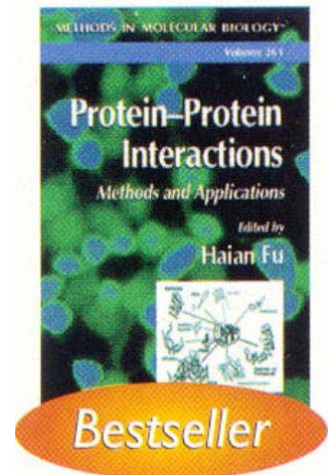
Methods and Applications

Edited by Haian Fu, Emory University School of Medicine, Atlanta, GA

Protein-Protein Interactions is a collection of highly successful biochemical, biophysical, genetic, and computational techniques for studying protein-protein interactions. These readily reproducible methods demonstrate how to identify protein interaction partners, qualitatively or quantitatively measure protein-protein interactions in vitro or in vivo, monitor Protein-protein interactions as

they occur in living cells, and determine interaction interfaces. The techniques described utilize a variety of cutting-edge technologies, including surface plasmon resonance (SRP), fluorescence resonance energy transfer (FRET), fluorescence polarization (FP), isothermal titration calorimetry (ITC), circular dichroism (CD), protein fragment complementation assays (PCA), various

two-hybrid systems, and proteomics and bioinformatics-based approaches, such as the Scansite program for computational analysis. These powerful tools are essential for deciphering how proteins interact with each other to form biological networks, as well as for unraveling protein-protein interactions in disease to find novel therapeutic targets.



Clinical Proteomics

The Journal of Translational Molecular Medicine

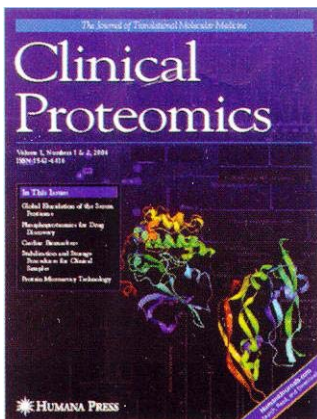
Daniel W. Chan, Editor-in-Chief

The field of molecular medicine is moving beyond genomics to proteomics, the goal being the characterization of the cellular circuitry and the understanding of the impact of disease and therapy on cellular networks.

Clinical proteomics is the application of proteomic technologies and informatic tools

to clinical material. The translational nature of this technology provides unique challenges and unbounded opportunities that promise to transform the way disease is detected, and managed.

Develop the mind of equilibrium. You will always be getting praise and blame, but do not let either affect the poise of the mind: follow the calmness, the absence of pride.

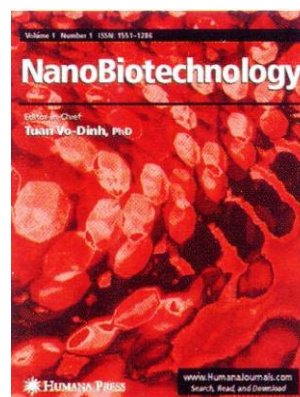


NanoBiotechnology

Tuan Vo-Dinh, TN; Thomas Laurell, Sweden; Eiichi Tamiya, Japan

Nanotechnology holds the potential to revolutionize many important scientific fields, ranging from biology to medicine. The combination of nanotechnology and molecular biology opens the door to many exciting possibilities for the detection and manipulation of molecules using nanodevices, holding high prom-

ise for both medical and biological research, as well as providing practical applications at the cellular level. *Nanobiotechnology* is a new international peer-reviewed scientific journal, to that provides a multidisciplinary forum for state-of-the-art nanobiotechnological methods, instrumentation, and research.



What we have done for ourselves alone dies with us; what we have done for others and the world remains and is immortal.



Templeton Prize for Leadership in Science and Public Life

The Abdus Salam International Centre for Theoretical Physics (ICTP) has established five annual Prizes for Leadership in Science and Public Life. Each Prize carries a cash award of US\$20,000. The prizes are being funded by the Templeton Foundation. Candidates should have a doctorate degree and be younger than 45 years old.

Abdus Salam Prize

For Leadership in Islamic Thought and the Physical Sciences.

Ahmed Zewail Prize

for Leadership in Islamic Thought and Biological Sciences.

Ahmed Zewail Prize

for Leadership in Islamic Thought and Chemical Sciences.

2 ICTP prizes for Leadership in Islamic Thought and Applied Sciences (medicine, agriculture, engineering, technology).

Applicants should submit an essay (<5000 words), and two letters of recommendation. For additional information, write to director@ictp.it.

Please send your texts or news for publication to :
news@isobc.org

- * **Hupo 4th Annual World Congress, August 28– September 1, 2005.**
Munich, Germany. Next registration deadline: July 31.
New late breaking abstract deadline: August 5. For details please visit www.hupo2005.com
- * **8th Iranian Congress of Biochemistry (The first International Congress of Biochemistry and Molecular Biology) September 11-15, 2005.**
Tarbiat Modares University, Tehran, Iran.
- * **Compartmentalization of Cyclic AMP Signalling, 29-30 March 2006.**
King's College, Cambridge, UK. For details please visit www.biochemistry.org/meetings
- * **Non-Vesicular Intracellular Traffic, 15-16 December 2005.**
Goodenough College, London, UK. Deadline for abstract submission: 20 October 2005.
- * **Recombinant DNA Technology for the 21st Century, 21-22 November 2005.**
AstraZeneca, Loughborough, UK. Deadline for abstract submission: 3 October 2005.
For details please visit www.biochemistry.org/meetings
- * **Cytokine-Proteoglycan Interactions: Biology and Structure, 9-10 January 2006.**
Royal Holloway, University of London, UK.
Deadline for submission of abstract: 11 November 2005.
For details please visit www.biochemistry.org/meetings
- * **Neurotrophins: Mechanisms in Disease and Therapy, 6 April 2006.**
School of Chemistry, Bristol, UK. Deadline for abstract: 31 January 2006.
For details please visit www.biochemistry.org/meetings
- * **Protein Imaging using Molecular Electron Tomography, September 1-2, 2005.**
Hotel@MIT, Boston, US. Register at www.sidec.com/conference-2005
- * **American Association of Pharmaceutical Scientists Annual Meeting and Exposition, November 6-10, 2005.**
Gaylord Opryland Resort & Convention Center Nashville, Nashville, TN.
For up-to-date information, log on to: www.aapspharmaceutica.com/annualmeeting
- * **8th Physical Chemistry Seminar. November 14-17, 2005.**
Mashad, Iran. For details please visit www.fos.ut.ac.ir
- * **International Conference on Research Methodologies in Science and Engineering Technology. December 6-8, 2005.**
Tehran, Iran. For additional information please visit www.ICMRSE.IR
- * **9th European Symposium on Thermal Analysis and Calorimetry 27-31 August 2006 Cracow, Poland**
General information about Conference at www.estac9.krakow.pl