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Editorial Open Access

The Journal of Physical Chemistry and Biophysics in a Turbulent World of Ever-Increasing Scientific Output

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We live in a world of databases. We are flooded with information. Is it good or bad? It's certainly a good thing that comes with challenges. It is like a cloud with a silver lining, and the latter is real bright and luminous. Any information about atoms, molecules, supramolecular assemblies is just a few clicks away, something the mid- and even late-20th century researchers could not even dream of. For example, you can attain the sequence and properties, and in most cases the structure, of any protein in less than a minute. Moreover, physical and chemical details of atoms and molecules such as energy levels, transitions, thermodynamics, various kinds of electronic, vibrational, and magnetic resonance spectra, are easily available from multiple databases, such as the 69 Standard Reference Databases offered by the National Institute of Standards and Technology. On the other hand, it's not easy to keep pace with the fiercely mounting scientific and technology information. Reaxys reports properties of ~ 2.2 million inorganic and organometallic compounds, PubChem offers around 160 million chemical compounds, 60 million chemical structures, and 1 million biological assays [1]. Along with over 100 million DNA and protein sequences involving ~ 260,000 species that are available through the National Center for Biotechnology Information, over 115,000 macromolecular structures deposited in the Protein Data Bank, the amount of information simply becomes incomprehensible. Oftentimes we feel like we can't see the trees because of the forest.

The number of scientific publications proliferates exponentially as well [2]. Only PubMed contains over 25 million citations from ~ 20,000 journals and grows at a rate of around 3,000 published papers daily. Scopus holds 55 million records from 22,000 journals (5,000 publishers). Adding publications from other sources such as ArXiv, Scientillion, Inspec, MathSciNet and others, the number of papers concerning medicine, natural sciences, engineering, and math exceeds 100 million. Recent annual increment of scientific output has been estimated to be 8-9%, with a doubling time of around 9 years [2]. Thomson Reuters' Web of Science contains ~ 90 million records that include over a billion citations from various disciplines, adding around 65 million new citations per year (http://wokinfo.com/citationconnection/realfacts/#regional). Does it make our lives easier? What do you do when a keyword such as "amyloid" generates 70,000 hits? Reading only the top 1% of papers related to your work becomes an arduous task.

The ever-increasing flood of research papers has inevitably prompted an outpouring of new journals. On-line and open-access journals are emerging and growing like mushrooms after rain. Some persist and grow and some wane. The *Journal of Physical Chemistry and Biophysics* is one of OMICS International's 18 Chemistry Journals that was launched in 2011 and has since published 122 articles in 5 volumes, comprising total 21 issues as of December 2015. The *Journal* covers a wide range of topics in physical chemistry of (macro)molecules and biophysics. Provided below is a brief survey of some articles published in volume 5 of the *Journal* in 2015.

The 6 issues of volume 5 of the *Journal* have published 34 articles, i.e., 7 editorials, 3 reviews, 21 research articles, 2 commentaries, and 1 conference proceeding. The research and review articles have covered a diversity of topics, ranging from self-organizing ionogels that may be used for production of soft materials with tunable properties [3] and ion-membrane interactions [4] to the biosynthesis of the fragrance of rose [5], DNA-protein interactions [6], and electron paramagnetic resonance (EPR) of membrane proteins [7].

Joshi and Rawat [3] describe the structure-property relationship of Laponite clay dispersions in ionic liquids that form soft material with easily adjustable properties, with potential industrial applications such as formulation of paints and varnishes, pharmaceuticals, cosmetics etc.

Pekker and Shneider [4] present an in-depth theoretical analysis of the surface electrostatics of biomembranes and ion-membrane interactions. Starting with the Poisson-Boltzmann and Gouy-Chapman-Stern theories, they reach conclusions regarding the mechanism of ion-lipid interaction, lateral immobility of bound ions, and their role in currents across ion channels and action potential of excitable (e.g., axonal) membranes.

Karami et al. [5] used bioinformatics tools to analyze the structure of *Rosa* phenylacetaldehyde synthase, an enzyme that catalyzes the production of the rose fragrance molecule. Comparison with the *Petunia* flower homolog allowed identification of the characteristic features of the rose enzyme, which can be used in artificial fragrance production by means of protein engineering.

Butusov et al. [6] studied interactions of DNA from calf thymus with various human and rabbit proteins on single-crystal silicon substrates by fluorescence spectroscopy. The results may potentially be used for construction of biosensors to detect proteins of defined structural features.

Finally, the review by Sahu and Lorigan [7] summarizes the achievements in the field of membrane protein structure and function, including site-specific structural characterization, obtained by EPR. The advantages of EPR, such as its high sensitivity, independence of protein size, versatility and relative ease of use, as well as the range of applications and the specific structural and dynamics information obtained are highlighted.

In conclusion, the *Journal of Physical Chemistry and Biophysics* serves the scientific community by publishing openly accessible papers in the fields of physical chemistry of organic and inorganic molecules

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and assemblies such as gels, suspensions, and emulsions, biomolecular physics, proteomics, molecular biology and biochemistry of proteins and nucleic acids and more. The *Journal* has demonstrated robust viability and now launches its volume 6 with determination to grow and improve further by publishing high quality research, by conveying scientific knowledge to the public, and fostering technology transfer and development.

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