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qualitative and quantitative results in agreement with experimental observations when a mechanical force is applied, through optical tweezer, on ends of RNA molecule, being used to pull the molecule until a threshold value where it unfolds. In this way , the force-extention curves are obtained, i.e., force as function of the distance between the ends of molecule. Another situation of interest happens when an applied external force is mantained fixed on a threshold value, situation that allows the molecule to hop from a folded to a unfolded state. Simulational results of this situation allow access to free energy landscape of RNA hairpin molecule.

[12/05/09 - P086]
Study of electric field produced in adjacent regions and internal of the plasma membrane., M. A. G. Soares, *Universidade do Grande Rio*, F. A. O. Cruz, *Universidade Federal Rural do Rio de Janeiro*, C. M. Cortez, D. Silva, *Universidade do Estado do Rio de Janeiro* ■ The biological membranes studies take great importance when the biophysical and biochemistry processes occurred in cells are investigated [1]. The membranes are generally composed by a great number of lipids and proteins molecules bonded. Hydrophobic interactions are responsible for a thin, resistant and flexible structure, the lipid bilayer [2]. The membrane defines the cellular limit and controls an ionic gradient for different ions located at both extra and intracellular sides. The ionic gradient controls the intracellular communications with external environment and other cells [3]. Generally, the external surface of the plasmatic membrane is composed by a particular layer known as glycocalix, formed by carbohydrates residues. Internally, the cytoesqueleton, a protein structure supports and is responsible by the membrane form [1,4]. Thus, the plasmatic membrane can be considered as a parallel plates capacitor, externally formed by glicocalix and extra cellular media and internally by the cytoesqueleton. The internal and external surfaces are conductors, separated by a lipid bilayer that presenting dielectric characteristics. The capacitor is a system formed by a dielectric structure separating two conductors [5,6]. In this work, we studied for this membrane model, the electric field at all regions by solving the Poisson-Boltzmann equation. The studied regions were limited as function of the points: -infinity, -hg, -h, h, hs and +infinity, determined for the membrane physiological conditions. The electric field deformation due to the proximity of other electric charges was also performed. References: [1] L. M. S. Loura, R. F. M. de Almeida, Tópicos de Biofísica de Membranas, Editora Lidel, Lisboa, 1a. edição (2004). [2] A. de Fátima et al, Química Nova, 28, 306 (2005). [3] M. F. Marques Filho et al, Revista Brasileira de Otorrinolaringologia, 72, 25 (2006). [4] S. F. da Silva, Efeito Biológico da Lectina Vegetal Km+ Frente ás Células do Sarcoma-180, Dissertação de Mestrado, Universidade Federal do Pará, Belém (2005). [5] J. E. R. Dúran, Biofísica - fundamentos e aplicações, Pearson Prentice Hall, 3a. reimpressão (2006). [6] D. M. Redondo, V. L. Líbero, Revista Brasileira de Ensino de Física, 18, 137 (1996).

[12/05/09 - P087]
Giant vesicles under oxidative stress induced by a membrane-anchored photosensitizer, Karin A. Riske, , Tatiane Sudbrack, Nathaly L. Archilha, Adjaci U. Fernandes, André P. Schroder, Carlos M. Marques, Maurício S. Baptista, Rosangela Itri, *Unifesp, IFUSP-SP, IQUSP-SP, Institut Charles Sadron* ■ We have synthesized the photosensitizer amphiphile PE-porph consisting of a porphyrin bound to a phosphoethanolamine lipid headgroup. We study by optical microscopy the response to light irradiation of Giant Unilamellar Vesicles (GUVs) containing a mixture of unsaturated phosphatidylcholine lipids and different molar fractions of PE-porph. Thus, singlet oxygen production occurs at the bilayer surface. This system enables studies on the effects of lipid peroxidation in a more controlled fashion, allowing threshold determinations of membrane oxidative damage. Under irradiation, the PE-porph-GUVs exhibit a rapid increase in surface area with concomitant morphological changes. An increase of the average area per phospholipid in the bilayer is expected as a consequence of the conformational changes associated with hydroperoxide formation caused by the reaction of the chains unsaturated bonds with the oxygen singlet species produced by the anchored porphyrin. We quantify for the first time the increase in surface area of lipid bilayers as a function of irradiation time and of the photosensitizer molar fraction, which provides a measure of the efficiency of the photosensitizing agent. We expect that our results will help in the development of improved models of membrane photo-induced damage, which may be of help in the fields of photodynamic therapy as well as of UV-A induced skin damage.

[12/05/09 - P088]
Thermogravimetric Analysis of kidney stone with monohydrate calcium oxalate, Paula E. Ferreira, Leticia Kuplich, Danilo O. de Souza, Cintia G. P. Orlando, Humberto Belich, Janaina B. Depianti, Edna F. Medeiros, Marcos T. D. Orlando, *Grupo de Física Médica, Departamento de Física da Universidade Federal do Espírito Santo*, L.G. Martinez, *IPEN*, H. P. S. Correa, *UFMS* ■ Renal calculi with calcium oxalates are represented by the general formula CaC2O4.xH2O, where x is the number of bounded-water molecules, which can vary from 1 to 2. It can be formed on crystalline seed particles of organic or inorganic compounds that work as a nucleating substrate. Therefore, the H2O molecule might be bound or free, depending on if the H2O molecule belongs to the crystal structure or the organic compound among them. Some of the characterization techniques commonly used is not suitable to give the structural information about the H2O molecule. For instance, chemical, infrared spectroscopy and thermogravimetric analysis cannot define by itself whether the H2O molecule is structural or interstitial. Thermogravimetric Analysis (TGA) of kidney stones colleted from 56 donors of Vitória City, Espírito Santo State - southeast - Brazil was developed in order to investigate the phase transition diagram of calcium oxalate. X-ray powder diffraction was used as initial technique to classify the initial composition of