20TH CONGRESS OF THE INTERNATIONAL UNION FOR PURE APPLIED BIOPHYSICS (IUPAB)

50TH ANNUAL MEETING OF THE BRAZILIAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY (SBBQ)

45TH CONGRESS OF BRAZILIAN BIOPHYSICS SOCIETY (SBBF)

13TH BRAZILIAN SOCIETY ON NUCLEAR BIOSCIENCES CONGRESS

PROGRAM AND ABSTRACT BOOK

October, 2021

20th International Congress of the International Union for Pure Applied Biophysics (IUPAB)

50th Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology (SBBq)

45th Congress of Brazilian Biophysics Society (SBBf)

13th Brazilian Society on Nuclear Biosciences Congress (SBBN)

São Paulo, Brazil
October 4th to 8th, 2021

.

Ilustração da Capa: Alexandre Takashi

CA - Applications in Biomedical and Materials Science

CA.01 - Luminescence of complex cis-[Ru(phen)2(3,4Apy)2]2+ in model membranes

Maria Laura da Cruz Garcia [1], Rose Maria Carlos[1]
[1]Departamento de Química, Universidade Federal de São Carlos (São Paulo, Brazil)

The study of the interaction between the transition metal complex cis-$[Ru(phen)_2(3,4Apy)_2]^{2+}$ (RuApy) and cell model membranes was motivated by previous studies from our laboratory that demonstrate that RuApy has spectroscopic properties (in physiological environment pH 7,4: λ_{abs} = 480nm, ε_{480nm} = 9500 mol^{-1} Lcm^{-1} , λ_{em} = 655 nm, τ_{em} = 120 ns) that allow its use as a luminescent probe for the β-amyloid peptide(Aβ). These properties are important as the toxicity of Aβ can be influenced by those in neuronal cell membranes. In this context, this work investigates the interaction between RuApy and cell model membranes such as large unilamellar vesicles (LUVs) and giant unilamellar vesicles (GUVs) prepared with the negatively charged lipid DOPG. The luminescence auto suppression studies of RuApy in aqueous solution pH 7.4 (phosphate buffer) indicated a limit for the steady state luminescence studies at 60 μM. The complex was a sensitive probe in the presence of the DOPG(LUVs) vesicle, and this can be observed by the continuous suppression of RuApy emission at 655 nm. Studies carried out to determine the sensitivity of the RuApy complex against the LUV vesicle of DOPG indicated that 10 μM of complex is sensitive to a concentration of 5μM of vesicle. The results obtained so far indicate an electrostatic interaction between RuApy and DOPG(LUVs).

Keywords: fluorescence, model membranes, ruthenium complex
Supported by: CNPq, FAPESP and Capes

CA.02 - Improvement of the Methodological Strategies to Product Functionalizes Antibodies using Small Angle Neutron Scattering (SANS)

Beatriz Tremarin [1], Fabiano Yokaichiya[1], Guinther Kellermann[1], Margareth Kazuyo Kobayashi Dias Franco [3], Joachim Storsberg[2]
[1]Departamento de Física, Universidade Federal do Paraná (Paraná, Brazil), [2]Healthcare, Biomaterials and Cosmeceuticals, Fraunhofer-Institute for Applied Polymer Research (Potsdam, Germany), [3]Rejeitos Radioativos - GRR, Instituto de Pesquisas Energéticas e Nucleares (São Paulo, Brazil)

Antibodies are used by jawed vertebrates for defense against invading pathogens. Usage of those versatile tools in a plethora of settings in clinics and biomedical sciences hinges on functionalization strategies that retain native antibody reactivity. To this date, antibody functionalization is performed by trial and error. We aim to reduce costs by providing general principles to allow the full spectrum of antibody functionalization by correlating functionalized antibody reactivity to cognate antigen by small angle neutron scattering, SANS, measurements and mathematical modeling of antibody and antibody-antigen super-complexes, obtained by titration experiments. For this research we have used for as antibody pure goat anti rabbit immunoglobulin, and for the antigen, pure Horseradish Peroxidase Preliminary results show that the systems (antibody and antibody-antigen complexes) do not change in the range of a temperature related to storage temperature (25º C), body temperature (37º C) and 40º C. These results will give us the pair distribution function of these systems and the results will be viewed in light of published precedence to highlight areas where future effort is needed to refine such versatile tools and improve their production. However, between the antibody and the complexes structure, different conformations were observed. The antibody has a globular structure with a radius of gyration around 33 Å, and the complexes display an elongated cylindrical shape with radius of gyration around 63 Å. This study shows how the scattering techniques (SANS) can provide useful information about the conformation of the antibody and antibody-antigen formation and help to shed light in the understanding the physical, chemical, and structural changes on the organization of these important antibody functionalization for the immunological system.

Keywords: Antibody-Antigen, Biophysics, SANS
Supported by: CNPq