B07 - PEPTIDES AS A PROMISING TOOL FOR SELF-ASSEMBLED MONOLAYERS IN CAPACITIVE DIAGNOSTICS

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Electrochemical capacitance spectroscopy (ECS) has been introduced as impedance based approach for assays as sensitive and technique capable to indicate interfacial change, such as target binding at an appropriate receptor. Herein, we integrated synthesis of redox-tagged peptide with self-assembling capability, for C Reactive Protein (CRP) detection (a biomarker of risk of diabetes, hypertension, and cardiovascular disease). Peptides containing ferrocene (Fc) were synthesized by solid phase peptide synthesis: Fc-E-A-A-C-NH_2 and Fc-E-A-A-A-C-NH_2. Ferrocene molecule is related to the electron transfer that occurred in the system as confirmed by redox capacitance. Peptides were used for generating self-assembled monolayers over gold surfaces and it was used for capacitance-based impedance spectroscopy. The platforms were able to detect CRP with a limit of detection (LOD) of 0.30 and 0.24 nM. The difference found on LOD and sensitivity are attributed to the peptides sequences and their probe redox distance. Therefore, we have monitored immunosensor construction with PM-IRRAS. The spectra showed bands at 1550 cm^{-1} and 1655 cm^{-1} assigned to amide II and amide I groups present in the peptides, antibody and antigen. The area and intensity of these bands indicated the organization of self-assembled monolayers. The immunosensors are highlighted for the robustness and potential to be used in real samples, once they showed specificity response to the target, these systems could be used for any relevant biomarkers diagnostics.

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B08 - EVALUATION OF COMBINED PHOTODYNAMIC INACTIVATION AND NO RELEASING CHITOSAN NANOPARTICLES ON CUTANEOUS LEISHMANIASIS

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Cutaneous leishmaniasis (CL) is a chronic disease developed by parasites of the genus *Leishmania* that promotes destructive lesions. The available treatments are limited because of side effects, resistance and toxicity. New strategies against CL have been studied such as Photodynamic inactivation (PDI) and exogenous NO donors. The aim of this work was to explore the effects of methylene blue (MB)-mediated PDI in association with encapsulated NO donors in chitosan nanoparticles (NPNO) on *Leishmania amazonensis*. NPNOs were tested *in vitro* with *L. amazonensis* transgenic line expressing luciferase at increasing concentrations (25-200μM) and inhibitory concentrations (IC_{50} and IC_{90}) were calculated. Based on inhibitory concentrations results, twelve BALB/c mice were infected in the left footpad and randomly assigned to experimental groups (n=4): Control (non-treated), G1 (two PDI sessions), G2 (two PDI sessions and 80 μM of NPNO, immediately after PDI) and G3 (only 80 μM NPNO). PDI was performed using a red LED (λ= 660$\pm$22 nm) at 150 J/cm^2 fluence and MB at 100 μM. Parasite burden was obtained by bioluminescence every day, in the first 96 h and for the next 4 weeks, once a week. Test groups presented significant reduction in parasite load compared to control during all experimental period. In the first 24 h after treatments, parasite burden was significant lower for G2. After 96 h, all test groups were similar. Following 4 weeks, statistically significant differences were noticed when test groups were compared to control but parasite burden was similar among all treated groups. Under conditions used in this study, our results show that NPNOs were not able to sustain the parasite killing promoted by MB-mediated PDI on CL induced in mice 24 h after treatments.

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B09 - PORE FORMATION MECHANISMS STUDIES BY ANTIMICROBIAL PEPTIDE Ctx(Ile^{21})-Ha USING ELETRONIC PARAMAGNETIC RESONANCE

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Over the past decades, a large number of antimicrobial peptides (AMPs) have been identified from a variety of vertebrate and invertebrate species, such as magainin, aurein, cecropin, ceratotoxin, among others peptides. The permeabilizing properties destroying bacterial membranes with consequent cell death, it makes these peptides the main focus in the development of new antibiotics. In particular, the antimicrobial peptide Ctx (Ile^{21})-Ha, extracted and isolated from the Brazilian frog *Hypsiboas albopunctatus*, has been shown to be a very promising molecule for this purpose due to its biological activities against fungi, bacteria and its moderate toxicity against human cells. This work proposes a structural, conformational and topological studies through biophysical techniques in order to clarify the Ctx(Ile^{21})-Ha peptide oligomerization pore formation, since it is not known specifically how this mechanism works in the interaction with membranes at a molecular level. The EPR and DEER techniques provided information regarding the spin distance markers contained in the peptide monomers in the absence and presence of membrane mimetics, by insertion of paramagnetic compounds such as TOAC and MTSSL into the peptide chain. In addition to these techniques, the studies were complemented using circular dichroism, in order to obtain important data about structure and function membrane-peptide interactions, as well as to suggest a mechanism of pore formation by measuring the distances between paramagnetic centers. This information is essential in an attempt to improve the modulation of its activity and broaden the understanding of the peptide mechanism action.

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B10 - Comparison of the cytotoxic and phototoxic effects of curcumin and chlorin e6 on J774 macrophages infected with Leishmania promastigotes

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Cutaneous Leishmaniasis is an infectious disease caused by protozoa of the genus Leishmania. Brazil is considered an intense transmission area, with 47.4% of the population in transmission areas. Conventional treatment is toxic and, in many cases, requires patient hospitalization, which increases the cost of treatment. Photodynamic therapy (PDT) has been studied as an alternative therapy for the local treatment of cutaneous lesions, minimizing systemic side effects. The objective of this study was to compare the effect of PDT with curcumin (500, 250, 125 and 62.5 μg / ml) and chlorin e6 (400, 200, 100 and 50 μg / ml) on macrophages infected with L. major and L. braziliensis, after one hour of incubation with different concentrations of both photosensitizers. Mitochondrial activity and cell viability were assessed by MTT and Trypan Blue tests. Although the MTT test demonstrated change in mitochondrial cell activity after treatment with curcumin in the dark and after PDT, the trypan test showed no toxicity in the dark, while PDT triggered 100% death at all concentrations tested. Chlorine e6 also promoted significant changes in mitochondrial activity and, unlike that observed in curcumin treatment, chlorine showed dark toxicity at the highest concentrations (400 and 200 μg / ml) and all concentrations resulted in 100% death after PDT. Both photosensitizers have shown promising results and can be used in the future for *in vivo* tests.

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