The major public health risks associated with the Zika virus (ZIKV) pandemic infection are neurological disorders, such as Guillain–Barré syndrome and congenital abnormalities. Due to the lack of vaccines and antivirals, the treatment remains non-specific. Efficient diagnostic tools can help stopping the virus spread and guide prophylactic and therapeutic interventions, however, in the main in the field is the development of diagnostic approaches. To this aim, a high-density peptide array was synthesized by printing the whole proteome of ZIKV, under the form of 15-mers peptides, on a microchip and tested against 192 sera from ZIKVinfected individuals with and without Dengue – DENV background. The analysis of the IgG antibody profiles allowed the identification of a peptide sequence corresponding to the ZIKV NS2b protein specifically recognized by 71% of the ZIKV positive sera. The immunoreactivity of this epitope was further confirmed by ELISA, which showed that the identified peptide can partially discriminate ZIKV from DENV infections. Quantitative analyses using Microscale Thermophoresis (MST) was used to determine the antibody binding affinity of specific IgG antibodies to the NS2b peptide. The MST data showed that ZIKV-specific antibodies recognize the NS2b peptide with higher affinity (at least two orders of magnitude higher). The immunoreactivity of this epitope towards antibodies from DENV-infected individuals. Future work will involve the engineering of this epitope in its native-like structure into a scaffold protein aiming to improve its recognition by specific antibodies. Ethical Committee approval numbers: 15850013.5.1001.5534 and 28309414.9.3001.5201.

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Photochemotherapy is a technique used in the treatment of cancer by applying light to induce photosensitizers (PS) to produce reactions that lead to death of the cell onto which PS are attached. The use of a carrier to bring PS to diseased tissues would improve their selectivity. In this sense, serum albumin can be an option as a carrier once it is abundant in the living tissue and has affinity to these cancer cells. In the present study, we studied the interaction between bovine serum albumin (BSA) and two types of Protoporphyrin IX (PpIX) used as PS: synthetic and endogenous extracted from Harderian glands of rats. The use of BSA is justified by its similarity with Human Serum Albumin (HSA). PpIX is an intrinsic photosensitizer of the human body, emits strong fluorescence, has effective production of singlet oxygen which makes it an efficient PS. Changes in the profile of optical absorption spectra and fluorescence emission and decay of lifetime show that BSA binds to PpIXs, but these photophysical changes do not impair efficiency. Particle size measures at pH 4.5 and 7.3 were carried out. The results showed the formation of BSA-PpIX complexes depending on BSA concentration with sizes ranging from 5-1000 nm, for both PS. The formation of the complex was favored at pH 4.5, close to the BSA isoelectric point. 1 WUNDER, A.; MÜLLER-WUNDER, A.; MÜLLER-LADNER, U.; STELZER, E. H. K.; et al. Albumin-based drug delivery as novel therapeutic approach for rheumatoid arthritis. Journal of immunology (Baltimore, Md.: 1950):

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