**03-086**

**THE EFFECTS GAMMA RADIATION DOSE ON THE SWELLING CAPACITY OF PVP/LIGNIN HYDROGELS DRESSINGS FOR WOUND TREATMENT.**

Nogueira, K.M.(1); Varca, J.O.(1); Lima, C.S.A.(2); Varca, G.(3); Lugão, A.B.(4); Freitas, L.F.(5); (1) IPEN / USP; (2) IPEN - USP; (3) IPEN/CNEN-SP; (4) IPEN; (5) ;

Lignin is a carbon renewable source and has been widely explored in different areas in the last years, especially in the biomaterials field as dressings and other biomedical devices due its natural origin and low cost (1). Its chemical structure confers important properties to this macromolecule such as antioxidant capacity, UV protection and bactericidal activity (2,3). Polivinylpirrolidone (PVP) is a polymer widely applied for biomedical applications due to its relevant properties, such as the water absorption capacity, suitable mechanical properties for wound healing applications, and the capacity to originate hydrogels with different characteristics (4). Gamma radiation is a relevant option to produce biomedical devices, as the technology allows polymer crosslinking and sterilization in a single step (5). Two polymer solutions were prepared, PVP 10% (w, v) in distiled water (neutral pH) with poly(ethylene glycol) diacrylate (1.0% w/v) and lignin 6% (w, v) (pH > 13) and homogenized separately, until complete dissolution. The solutions were mixed in the follow ratios 95/5, 90/10 and 80/20, in which were added to a 2% (w, v) of agar and mixed at 70 ºC for 30 minutes. Samples were disposed in glass moulds and irradiated at 25, 50 and 100 kGy at dose rate of 5 kGy/h in a 60Co irradiator. Samples assessed by autoclave presented higher swelling than the PVP control, but lower gel fraction in comparison with the standard, except for formulation 90:10. Swelling and Gel Fraction were also evaluated by shaker at 37 ºC for 24 h. The results showed that the increase of dose decrease the swelling capacity and gel fraction decrease with the increase of lignin in the formulations. In general, the hydrogels irradiated at 25 and 50 kGy, except for formulation 80:20 at 25 kGy, presented good integrity and suitable results to be considered for the next steps of the study and are promising for biomedical application.