Co-electrospinning of bacteria and viruses WAEL SALALHA, Faculty of Mechanical Engineering, JONATHAN KUHN, Faculty of Biology, SHMUEL CHERVINSKY, EYAL ZUSSMAN, Faculty of Mechanical Engineering, Technion — Co-electrospinning provides a novel and highly versatile approach towards composite fibers with diameters ranging from a few hundred nm down to 30 nm with embedded elements. In the present work, co-electrospinning of poly(vinyl alcohol) (PVA) and viruses (T7, T4, λ) or bacteria (Escherichia coli, Staphylococcus albus) was carried out. These preparations should have applications for tissue engineering, gene therapy, phage therapy and biosensing. The average diameter of the co-spun nanofibers was about 300 nm. We found that the encapsulated viruses and bacteria manage to survive the electrospinning process, its pressure buildup in the core of the fiber and the electrostatic field in the co-electrospinning process. Approximately 10% of the Escherichia coli and 20% of Staphylococcus albus cells are viable after spinning. Approximately 5% of the bacterial viruses were also viable after the electrospinning. It should be noted that the encapsulated cells and viruses remain stable for two months without a further decrease in number. These results demonstrate the potential of the co-electrospinning process for the encapsulation and immobilization of bio-objects and the possibility of adapting them to technical applications (e.g., bio-chips).