**Physically crosslinked hydrogels based on Poly (vinyl alcohol) and fish gelatin for wound dressing application: Fabrication and Characterization**

Liping Zhou1 , Shihui Pan1, Tingwei Xu1, Jicheng Yan1, Xin Li1 and Hao Chen1, 2

*1Marine collage, Shandong University (Weihai), Weihai 264209, China*

*2Beijing Advanced Innovation Center for Food Nutrition and Human Health, Beijing Technology and Business University (BTBU), Beijing 100037, China*

Poly (vinyl alcohol) (PVA) is a well-known polymer with good biocompatibility. However, PVA hydrogel possesses insufficient elasticity and swelling degree which limit its wide-spread utilization. In the present work, the interpenetrating double network composite hydrogel based on PVA and fish gelatin (FG) was prepared by thermal treatment and repeated freezing-thawing. A function of salicylic acid was incorporated into the hydrogel to improve its antibacterial and anti-inflammatory properties. The chromatic values, water contents, swelling kinetic studyet al. were investigated. The salicylic acid release from various hydrogel systems in vitro was performed to evaluate its drug-loading performance. In addition, the cumulative dissolution behavior of salicylic acid was monitored. The results revealed that as FG increased from 0 to 3.75 wt%, gels changed from white to slight yellow and the swelling ratio (during 8 hours) increased from 54% to 83%. All gels presented the swelling index within 0.5~1.0 meaning that they were not Fick Diffusion. The drug dissolution ratio was about 33.6% within 0.5 h and the normal distribution of cumulative dissolution was not significant (*p*＞0.05), which indicated the drug dissolution was a normal distribution. The overall results demonstrated that the PVA/FG-based hydrogel is a suitable biomaterial for drug-carrying wound dressing application.