

## Reconstructing Calvarial Bone Lesions Using PHBV Scaffolds and Cord Blood Mesenchymal Stem Cells in Rat

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**Abstract :** For tissue engineering of bone, anatomical and operational reconstructions of damaged tissue seem to be vital. This is done via reconstruction of bone and appropriate biological joint with bone tissues of damaged areas. In this study the condition of biodegradable bed Nanofibrous PHBV and USSC cells were used to accelerate bone repair of damaged area. Hollow nanofabrication scaffold of damageable life was designed as PHBV by electrospinning and via determining the best factors such as the kind and amount of solvent, specific volume and rate. The separation of osseous tissue infiltration and evaluating its nature by flow cytometric analysis was done. Animal test including USSC as well as PHBV condition in the damaged bone was done in the rat. After 8 weeks the implanted area was analyzed using CT scan and was sent to histopathology ward. Finally, the rate and quality of reconstruction were determined after H and E coloring. Histomorphologic analysis indicated a statistically significant difference between the experimental group of PHBV, USSC+PHBV and control group. Besides, the histopathologic analysis showed that bone reconstruction rate was high in the area containing USSC and PHBV, compared with area having PHBV and control group and consequently the reconstruction quality of bones and the relationship between the new bone tissues and surrounding bone tissues were high too. Using PHBR scaffold and USSC together could be useful in the amending of wide range of bone lesion.

**Keywords :** bone lesion, nanofibrous PHBV, stem cells, umbilical cord blood

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