Supplementory data:

1.Burn severity

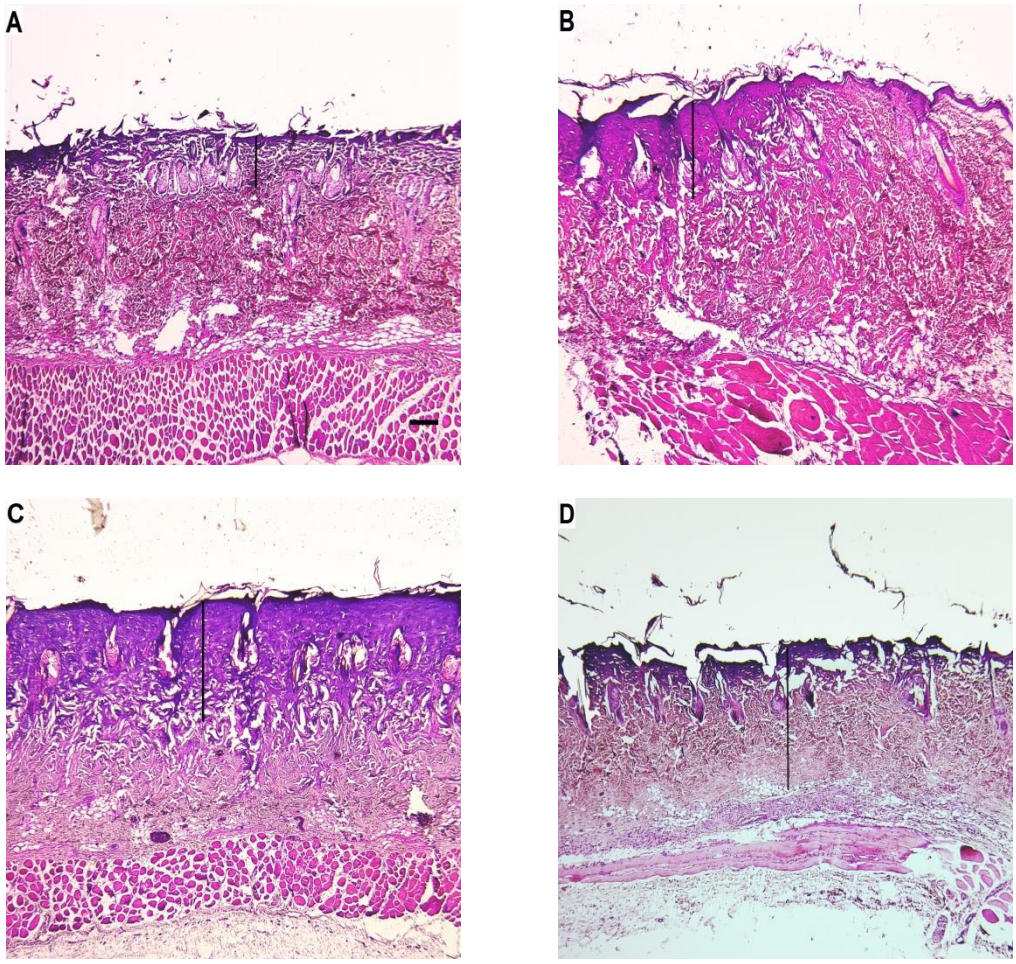


Figure 1-S. H&E slides of burned skin after 3 days of the wound creation. Black lines represent the Maximum depth of tissue damage. Burn temperature is 50˚, 70˚, 100˚, and 150˚c represent in A, B, C, and D, respectively. The burn duration time was 10 seconds in each temperature (Magnification: 4X, scale bar=50 µm. **A)** Shallow burn depth involves total destruction in epidermis and superficial portion of dermis. **B)** Superficial partial-thickness characteristics were observed like 50˚c burn but with progress in depth compared to the prior temperature. **C)** Destruction of epidermis and almost mid depth of dermis is seen. Although depth of thermal injury in 100˚c was increased but higher temperature was need for achieve to the burn features which belong to deep partial-thickness burn. **D)** The last micrograph shows attenuated epidermis with poor visibility of fine and coarse collagen fiber. According to the deep partial burn thickness definition up to 50 percent of derm thickness involved (Scale Bar=50µm).

2. Morphology of BMSCs

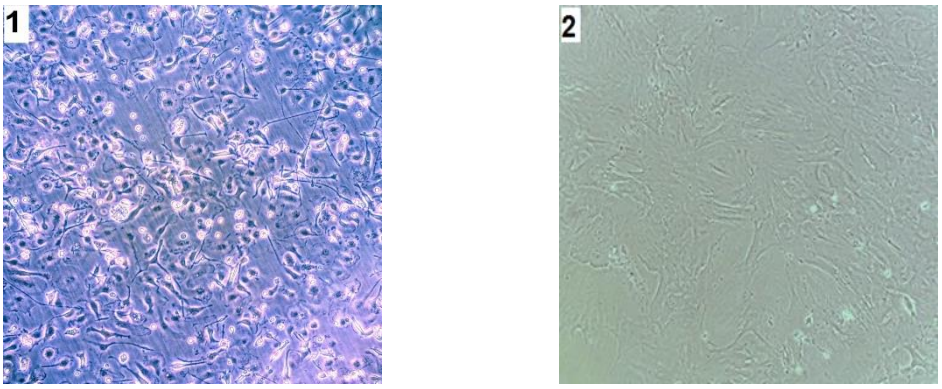
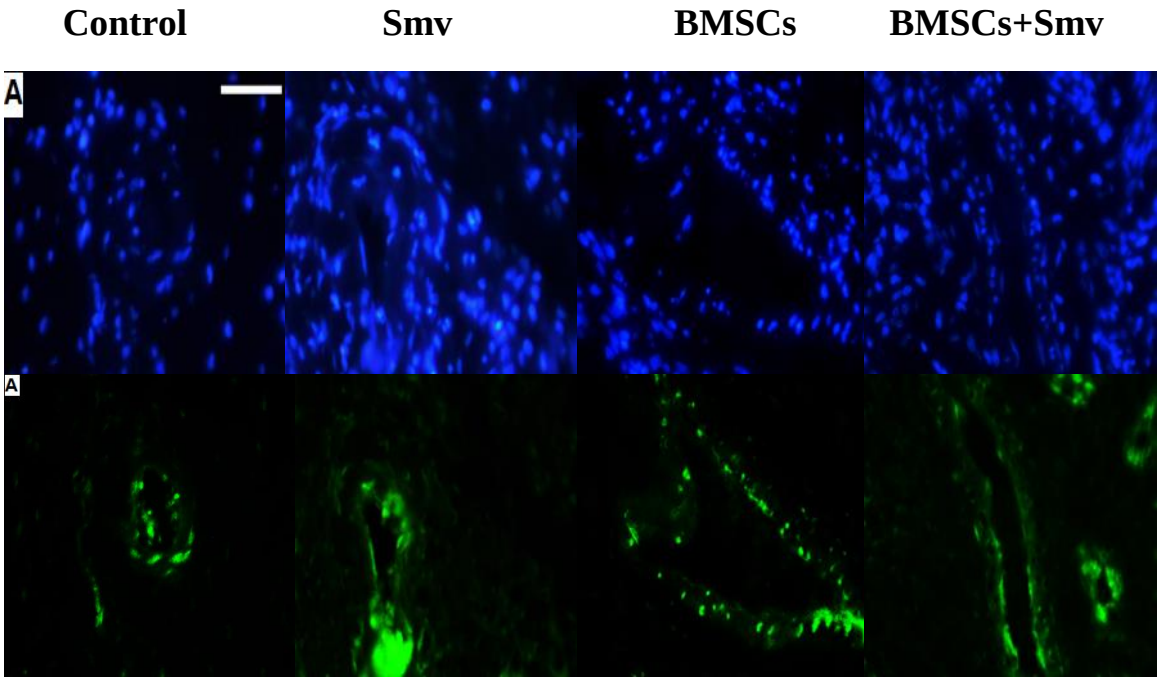


Figure 2-S. 1) After the initial seeding, the morphology of adherent cells seemed to be fibroblastic-like mononuclear cells **2)** The morphology of cells retained in fibroblast-like shape after reaching to the confluency.

3. Immunohistochemistry



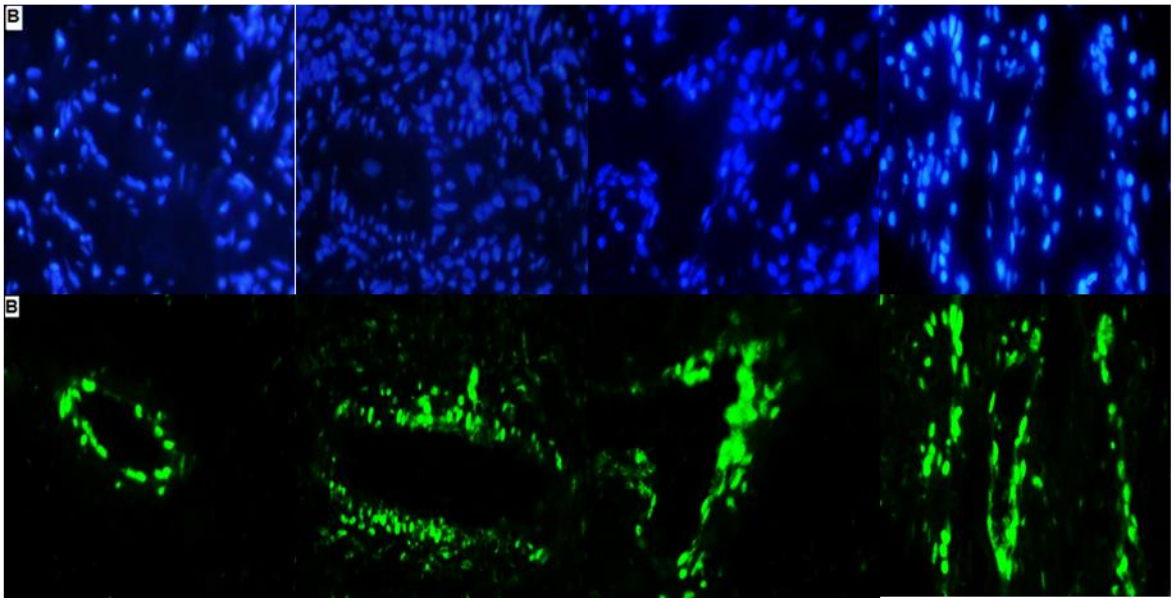


Figure 3-S. **A)** IHC staining using for VEGF positive (green) and DAPI positive (blue) **B)** Representative digital pictures showing anti-CD31 (green) and DAPI positive (blue) for nuclei in the different experimental groups. Merges picture were showed in main file (Scale bar=100µm).

4-s. Wound area calculation:

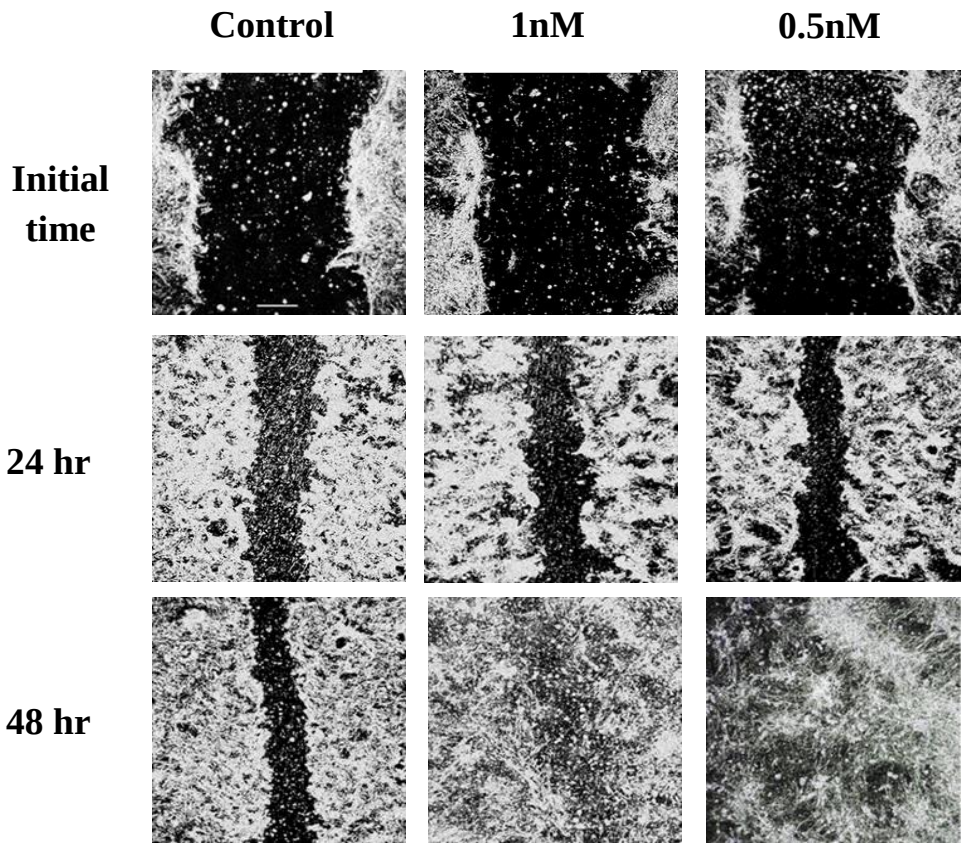


Figure 4-S: scratch images after find edges process in imagej software. Scale bar were placed in the middle of image for better visualization (scale bar=50µm).

5. Outline wound edges

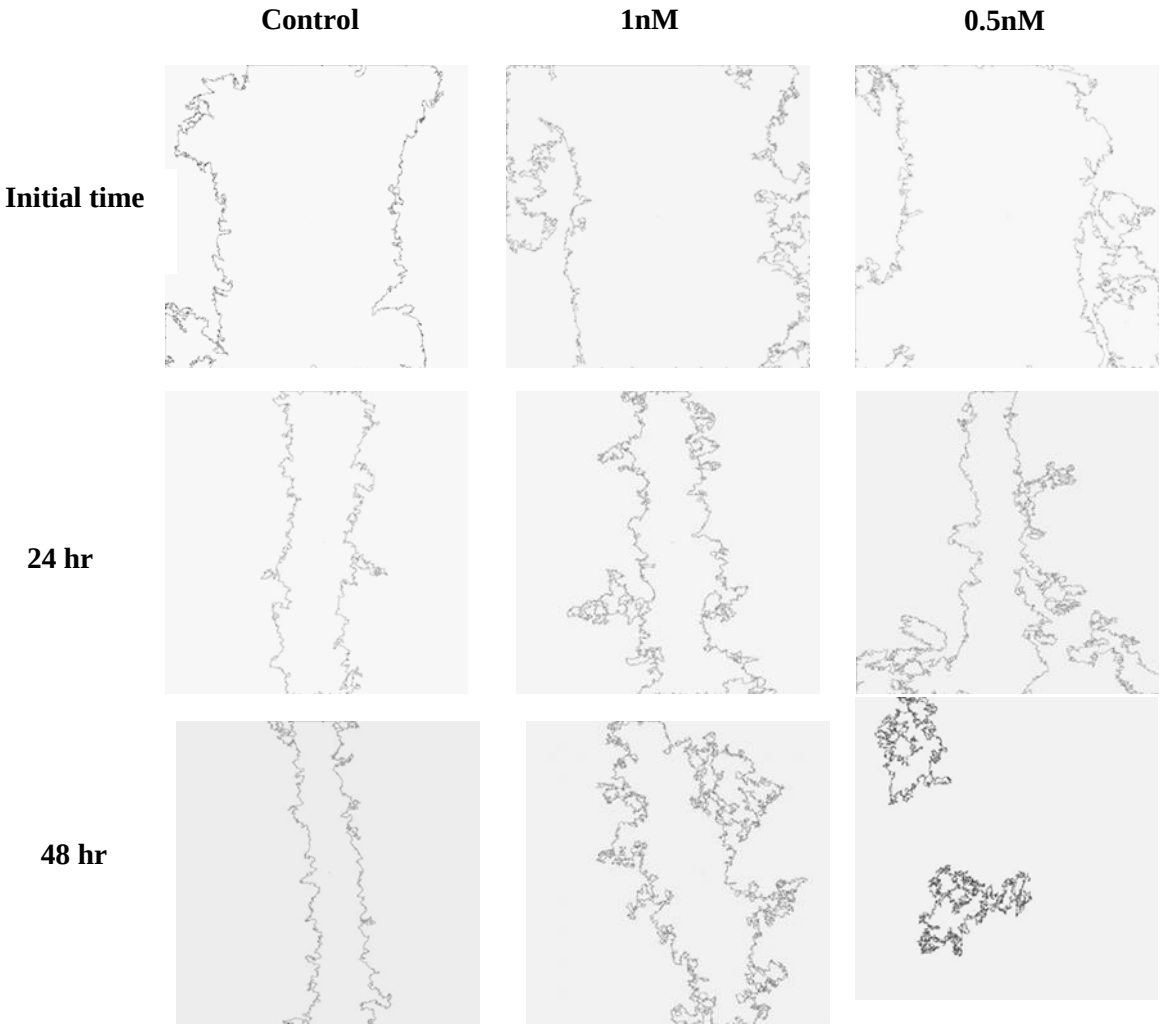


Figure.5-s: Outline images were mapped by imagej software. This image was used for accuracy confirmation of wound area calculation.