**Background:** Prostaglandin E\(_2\) (PGE\(_2\)) has bone-anabolic effects *in vivo* in animals and in humans, but its clinical utility has been hindered by side effects upon systemic administration. PGE\(_2\) acts on bone via the EP4 receptor and EP4 activation has been shown to activate osteogenesis. A conjugate of an EP4a specific receptor agonist and a bisphosphonate bound to a carrier material, and therefore locally targeting bone, can circumvent these side effects.

**Objectives:** The aim of this research was to demonstrate the impact of a bone-targeting conjugate on the wound healing and bone formation process in a jaw model in rats in order to predictably maintain ridge width after tooth extraction.

**Materials and Methods:** Molars 1, 2 and 3 of rats were extracted. Treatment groups included bone substitute material (BSM) alone (control), BSM and low dose of experimental drug (LD), BSM and high dose of experimental drug (HD). Animals were sacrificed after 7, 14 and 28 days. Samples were collected, processed (decalcified and undecalcified) and analyzed via MicroCT, TRAP staining, BSE and Trichrome Goldner staining.

**Results:** All groups over all three time durations showed increase in defect fill with no statistical sig. difference. The overall amount of mineralized tissue increased in all three groups with no statistical sig. difference. Osteoclast count (OC) and surface area (OCS) were reduced in the HD group after 14 and 28 days. Osteoid formation was elevated in the LD group after 2 and 4 weeks.

**Conclusion:** The combination of a BSM and conjugate seems to be a suitable approach for local targeting of extraction sockets. Further development of additional conjugates is underway to increase bioavailability and improve local delivery mechanism of PGE\(_2\).