The drug vehicle and solvent N-methyl pyrrolidone (NMP) prevents alveolar bone loss and dentinogenic activity deterioration in an osteoporotic animal model

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Background
Osteoporosis is a skeletal disorder prevalent in post-menopausal women affecting bone including periodontal bone loss, tooth loss and resorption of jaw mass. It has been demonstrated that osteoporotic women are at higher risk of tooth loss and deterioration of mandibular bone. This study aimed to test the therapeutic efficacy of N-methylpyrrolidone (NMP) in preventing alveolar bone resorption and preservation of tooth integrity using the classical osteoporotic rat model established for the evaluation of enhanced osteoporosis through ovariectomy (OVX).

Conclusions
NMP treatment prevents impaired mineralization and dentinogenic regeneration capacity as well as resorption of the mandibular bone in long-term estrogen deficient rat model.

Results
1. NMP prevents OVX-induced weight gain
2. Changes in jawbone indices were stopped by NMP
3. Predentin thickness was preserved in OVX NMP
4. DSP immunostaining is similar in Sham and OVX NMP groups
5. NMP treatment prevents mandibular bone resorption induced by ovariectomy

Methods
Female Sprague-Dawley rats were randomly divided into sham-operated group (Sham) either treated or not with NMP. Bilateral ovariectomy or Sham operations were and body weight was measured weekly. The rats were sacrificed after 15 weeks, the jaw bones were isolated and tooth pulp collected. Bone and tooth parameters were evaluated using X-ray radiography, immunohistochemistry, histology and scanning electron microscope.