The epigenetically active small chemical N-Methyl Pyrrolidone (NMP) prevents estrogen depletion induced osteoporosis

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Results

- NMP reverses OVX-induced weight gain 1
- The changes in bone markers were reversed by NMP 2
- NMP induces bone mineral apposition in OVX NMP 3
- NMP treatment decreases ovariectomy-induced bone resorption 4
- NMP treatment prevents trabecular architecture modifications induced by ovariectomy 5

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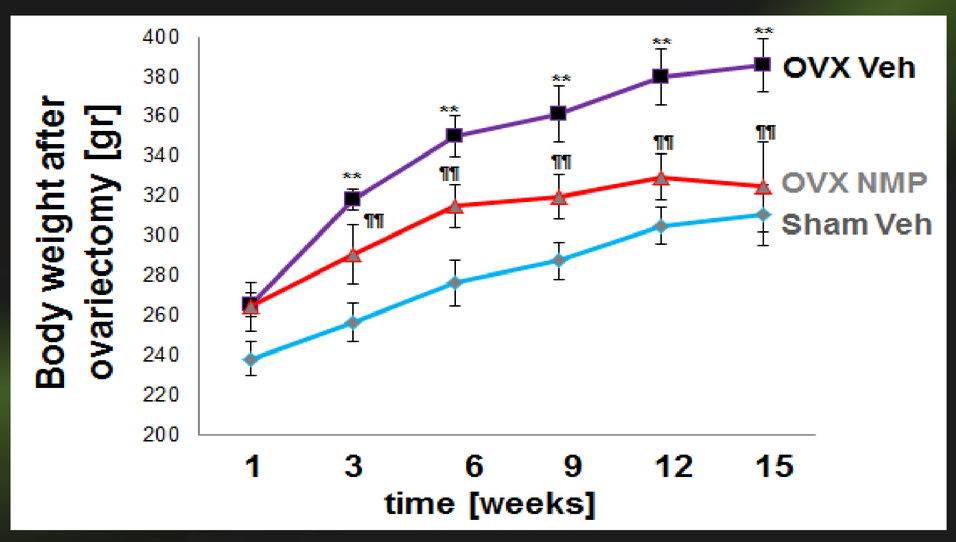

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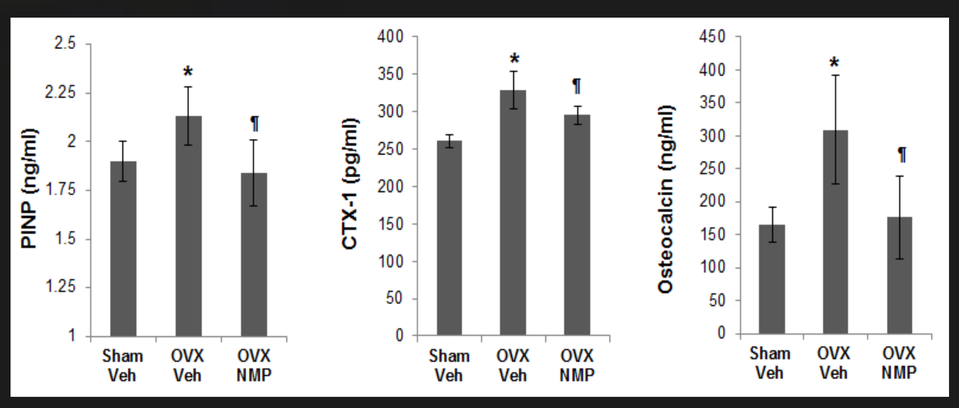

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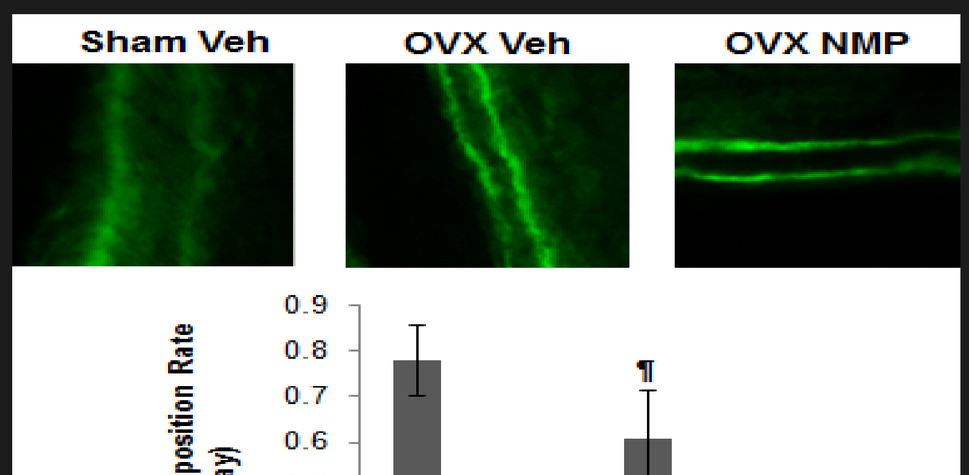

Background

Osteoporosis is a chronic, skeletal disease highly prevalent in post- menopausal women influenced by hormonal factors causing a huge burden on health care in an aging society. We previously demonstrated that NMP is a bioactive drug which enhances bone regeneration *in vivo* and acts as an enhancer of bone morphogenetic protein (BMP) *in vitro*. NMP also inhibits osteoclast differentiation and attenuates bone resorption.

Conclusions

NMP has a remarkable anti-osteoporotic activity, and may be a promising candidate for treatment of postmenopausal osteoporosis induced by estrogen deficiency.

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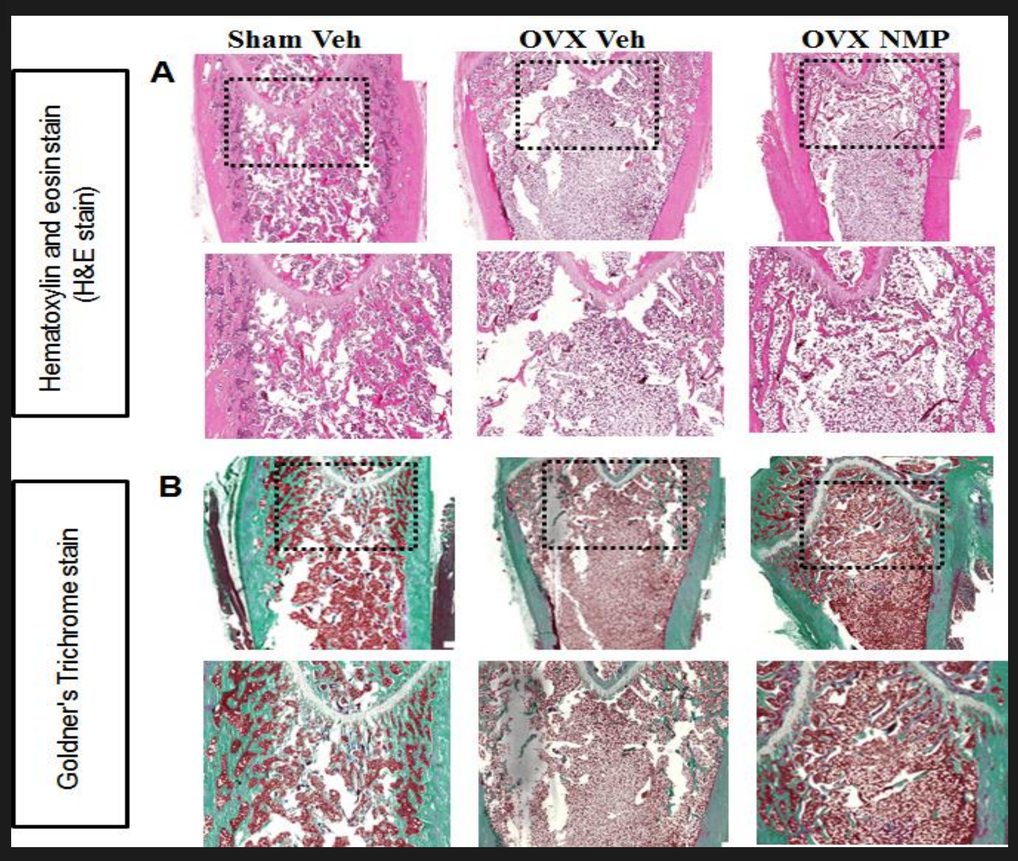

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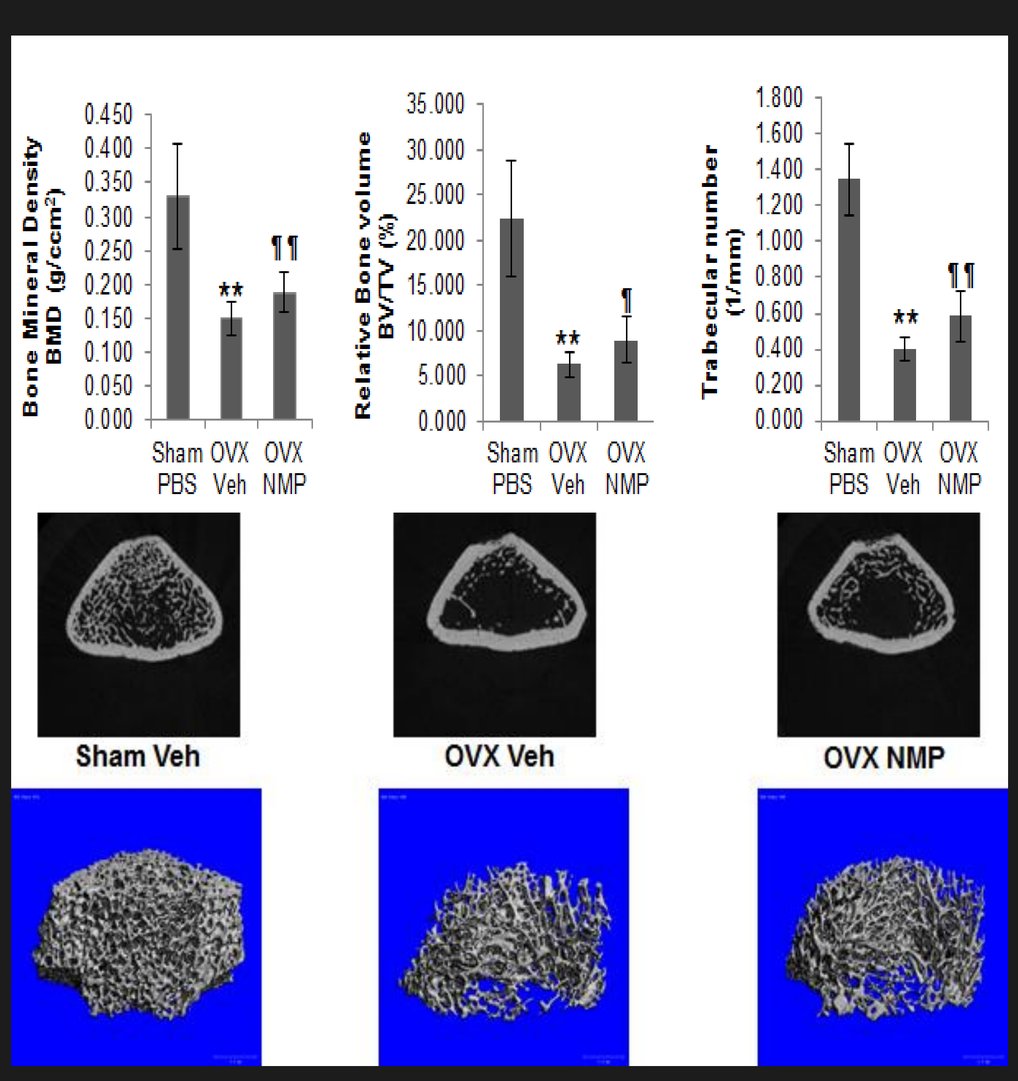

Methods

We want to show *in vivo* relevance of NMP by studying bone markers, inflammatory cytokines and bone quality in a preclinical osteoporosis model (ovariectomized rat mode). Female Sprague-Dawley rats with an approximate weight of about 230g were randomly divided into sham-operated group (Sham) and three ovariectomized subgroups as OVX (control) and NMP-treated OVX. Rats were treated weekly by i.p. injections.