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# Sex & Bone

## Position

Senior Lecturer, Sackler Faculty of Medicine

## Research

Sexual dimorphism skeletal remodeling is well-established, although not completely understood. Recently, we have characterized two pathways with sex-specific influence on the skeleton. (1) Moderate fluctuations in Wnt signaling, a ubiquitous pathway with critical roles in bone formation and resorption, affect preferentially the female skeleton. (2) Deficiency in *Krox20* in the monocytic/osteoclastic lineage results in a low bone mass phenotype in females only. The goal of my research group is to investigate the putative role of these pathways, as mediators of the sex-specific skeletal response to sex hormone signaling in osteoblasts (the bone forming cells) and in osteoclasts (the bone resorbing cells).

## Publications

Frenkel B, Hong A, Baniwal SK, Coetzee GA, Ohlsson C, Khalid O, **Gabet Y.** (2010) Regulation of adult bone turnover by sex steroids. *J Cell Physiol.*, 2:305-310.

Baniwal SK, Khalid O, **Gabet Y,** Shah RR, Purcell DJ, Mav D, Kohn-Gabet AE, Shi Y, Coetzee GA, Frenkel B. (2010) Runx2 transcriptome of prostate cancer cells: insights into invasiveness and bone metastasis. *Mol Cancer*, 9:258.

**Gabet Y,** Leclerc N, Baniwal SK, Shi Y, Kohn-Gabet AE, Cogan J, Dixon A, Chavez M, Guo L, Turman JE-Jr, Frenkel B. (2010) *Krox20*/*EGR2* deficiency accelerates cell growth and differentiation in the monocytic lineage and decreases bone mass. *Blood*, 116:3964-71.

**Gabet Y,** Noh T, Lee C, Frenkel B. (2011) Developmentally-regulated inhibition of cell cycle progression by glucocorticoids through repression of

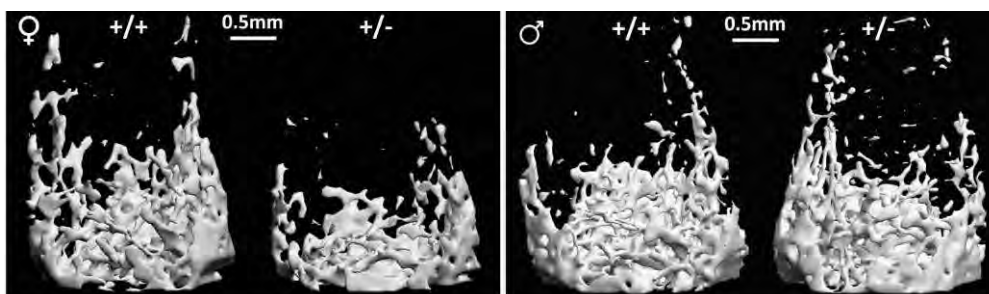


Figure 1: Low bone mass in *Krox20*-haploinsufficient females.  $\mu$ CT images of representative distal femoral trabecular bone of female and male *Krox20*<sup>+/+</sup> (left) and *Krox20*<sup>+/-</sup> (right) mice.

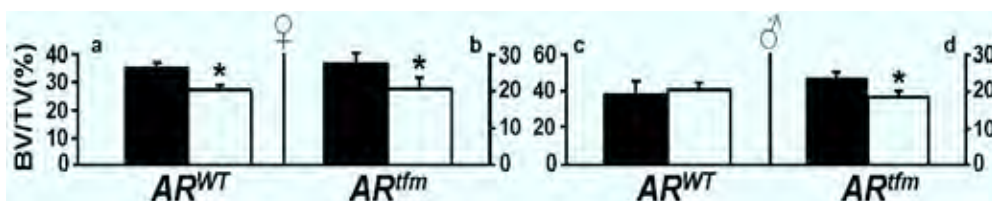


Figure 2. Effect of haploinsufficiency in *Lef1*, a Wnt transcription factor.  $\mu$ CT analysis of the vertebral trabecular bone of female (left) and male (right) *Lef1*<sup>+/+</sup> (black) and *Lef1*<sup>+/-</sup> (white) mice. *AR*<sup>tfm</sup> males have no functional AR, while *AR*<sup>tfm</sup> females are carriers for the defective *AR* allele. Data represent mean $\pm$ SEM, \* =  $p < 0.05$ . Note that only males carrying a functional AR are protected against *Lef1* gene dosage

cyclin a transcription in primary osteoblast cultures. *J Cell Physiol.*, 226:991-8.

Baniwal SK, Shah PK, Shi S, Haduong JH, DeClerck Y, **Gabet Y**, Frenkel B. (2011) Runx2 promotes both osteoblastogenesis and novel osteoclastogenic signals in ST2 mesenchymal progenitor cells. *Osteoporos Int.*, 23:1399-1413.

**Gabet Y**, Bab I. (2011) Microarchitectural changes in the aging skeleton. *Curr Osteopor Rep.* 9:177-83.

Yen HY, **Gabet Y**, Liu Y, Martin A, Wu N, Pike MC, Frenkel B, Maxson R, Dubeau L. (2012) Potential consequences of the BRCA1 mutation carrier state on estrogen responsive organs. *Lab Invest.* 92:802-11.

## Chapter

Smith P, Avishai G, Müller R, and **Gabet Y**. Computerized Reconstruction of Prenatal Growth Trajectories in the Dentition: Implications for the Taxonomic Status of Neanderthals. In S. Condemi and G.-C. Weniger (eds.), *Continuity and Discontinuity in the Peopling of Europe: One Hundred Fifty Years of Neanderthal Study, Vertebrate Paleobiology and Paleoanthropology*, Springer Science+Business Media B.V. 2011.

## Grants

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