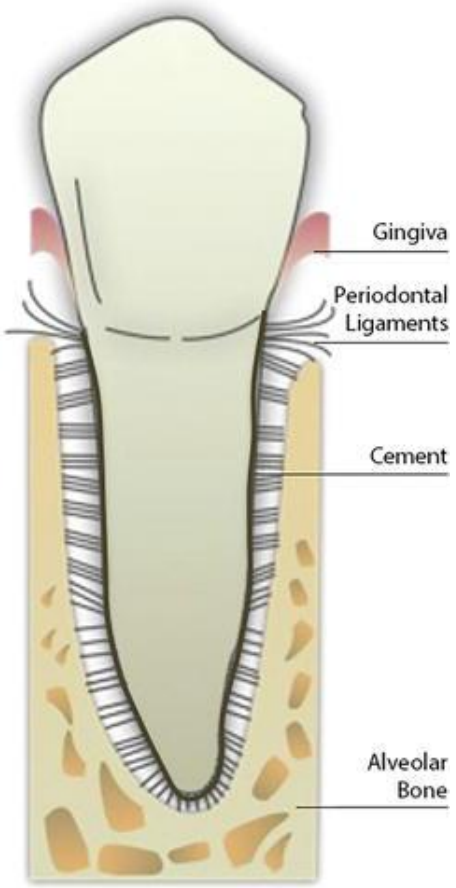
How do orthodontic forces influence bone formation and resorption?

Orthodontic Forces:

- Generated by appliances acting upon tooth, absorbed by surrounding periodontal tissues
- Cause local tooth **displacement** and **activate bone remodeling** processes via the periodontal ligament

Periodontal Ligament (PDL):

- Connects *cementum* to *alveolar bone*
  - Provides vascular supply & nutrients
  - Absorbs mechanical stress & anchors tooth
  - ***Regulates bone formation and resorption***
    - *Allows for tooth movement*



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"Pressure-Tension Theory":

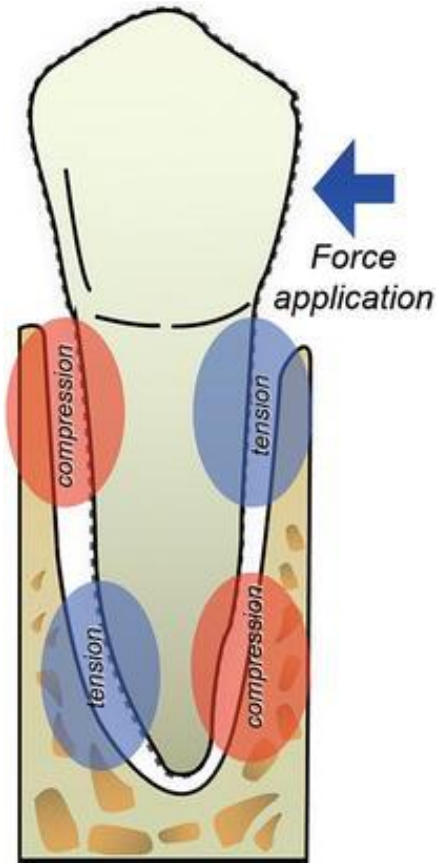
- Tooth *displacement* causes PDL to be *constricted* or *stretched* on opposite sides of the tooth

"Compression Side":

- Disruption of blood flow causes cell/tissue death
- **Resorption** of dead tissue/bone by macrophages/osteoclasts
  - Creates space for tooth movement

"Tension Side":

- **Bone formation** by osteoblasts fills gaps left behind by tooth movement



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