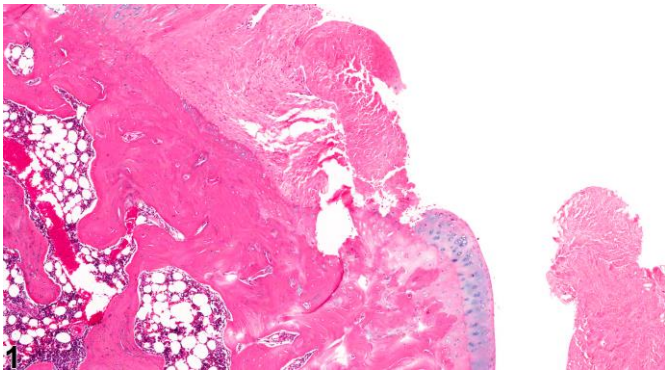


# NTP Nonneoplastic Lesion Atlas

## *Bone – Osteochondrosis*

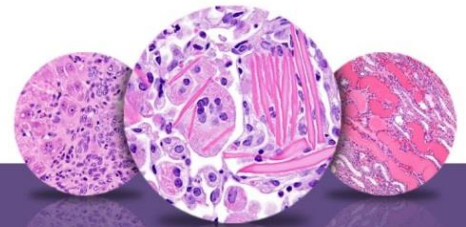


**Figure Legend:** **Figure 1** Bone - Osteochondrosis in a male F344/N rat from a chronic study. There is focal loss of articular cartilage with proliferation of subchondral fibrous connective tissue.

**Comment:** Osteochondrosis (Figure 1) is defined as a focal disturbance of enchondral ossification. The lesion is characterized by focal thickening of articular cartilage with extension of the cartilage into the subchondral bone. Hypertrophy of cartilage results from defective mineralization and decreased cartilage resorption, leading to a persistence of enlarged chondrocytes. Fissures form within the basal layers of the thickened cartilage, and fibrous connective tissue proliferation occurs subjacent to these fissures. Eventually, separation of the cartilage occurs, with formation of an articular flap. The lesion may progress to erosion of articular cartilage due to subchondral bone collapse.

Osteochondrosis occurs in a variety of domestic species, primarily as a lesion of young, rapidly growing animals, and is thought to be influenced by dietary, hormonal, anatomic, and genetic factors. Osteochondrosis occurs as a spontaneous lesion in aged rats, although lesions may sporadically occur earlier in life. Early histologic evidence of osteochondrosis includes thickening or fragmentation of the basal layer of articular cartilage and may be observed in Sprague-Dawley rats as early as six weeks of age. This lesion tends to occur in regions of articular cartilage that are thicker, such as the caudal aspect of the medial femoral condyles and humeral head. Lesions of osteochondrosis are focal in nature, although they may occur multifocally or bilaterally in the same animal.

Historically, osteochondrosis has also been recorded as osteochondritis and osteochondritis dissecans. The term “osteochondritis” is not appropriate since inflammation is not a characteristic feature of the lesion. The term “dissecans” is inappropriate since it implies cleft formation through the articular



# NTP Nonneoplastic Lesion Atlas

## *Bone – Osteochondrosis*

cartilage, while osteochondrosis is a spectrum of histologic features, cleft formation being an end-stage or progressed manifestation.

**Recommendation:** Although osteochondrosis is a spontaneous lesion, it should be diagnosed and given a severity grade whenever present.

### **References:**

Kato M, Onodera T. 1984. Spontaneous osteochondrosis in rats. *Lab Anim* 18:179-187.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/6748595>

Kato M, Onodera T. 1987. Early change of osteochondrosis in medial femoral condyles from rats. *Vet Pathol* 24:80-86.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/3824825>

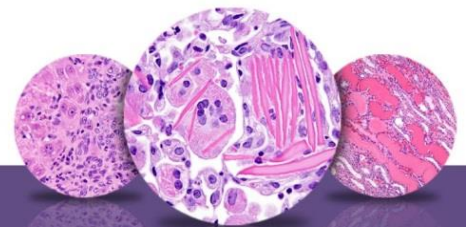
Kato M, Onodera T. 1988. Morphologic investigation of osteochondrosis induced by ofloxacin in rats. *Fundam Appl Toxicol* 11:120-131.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/3209010>

Leininger JR, Riley MGI. 1990. Bones, joints, and synovia. In: *Pathology of the Fischer Rat: Reference and Atlas* (Boorman G, Eustis SL, Elwell MR, Montgomery CA, MacKenzie WF, eds). Academic Press, San Diego, 209-226.

Long PH, Leininger JR. 1999. Bones, joints, and synovia. In: *Pathology of the Mouse* (Maronpot R, Boorman G, Gaul BW, eds). Cache River Press, St Louis, 645-678.

Long PH, Leininger JR, Ernst H. 1996. Proliferative lesions of bone, cartilage, tooth, and synovium in rats, MST-2. In: *Guides for Toxicologic Pathology*. STP/ARP/AFIP, Washington, DC.

Ytrehus B, Carlson CS, Ekman S. 2007. Etiology and pathogenesis of osteochondrosis. *Vet Pathol* 44:429-448.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/17606505>



# NTP Nonneoplastic Lesion Atlas

## *Bone – Osteochondrosis*

### **Authors:**

Mark J. Hoenerhoff, DVM, PhD, DACVP  
Associate Professor  
In Vivo Animal Core, Unit for Laboratory Animal Medicine  
University of Michigan Medical School  
Ann Arbor, MI

Amy Brix, DVM, PhD, DACVP  
Senior Pathologist  
Experimental Pathology Laboratories, Inc.  
Research Triangle Park, NC