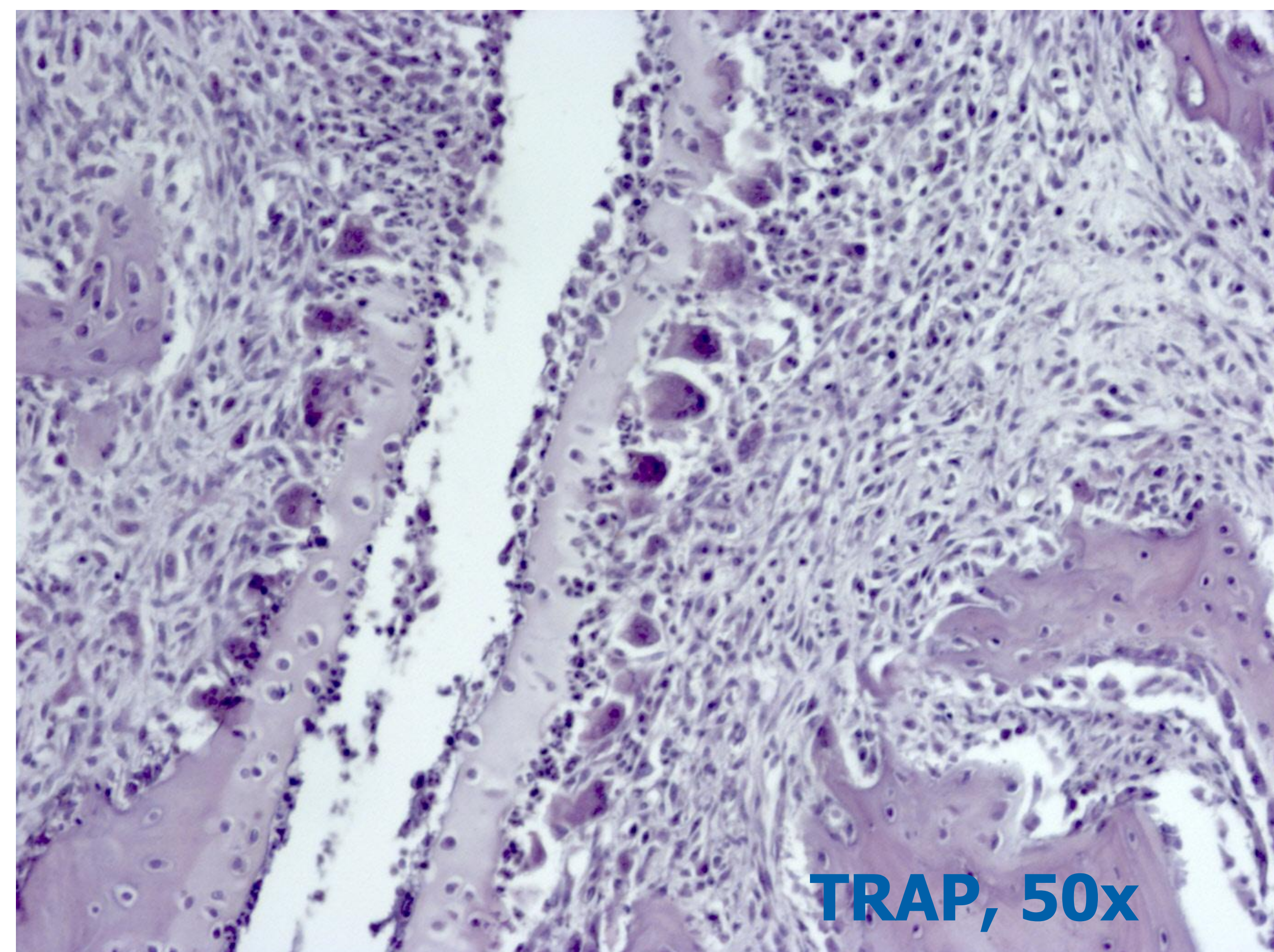


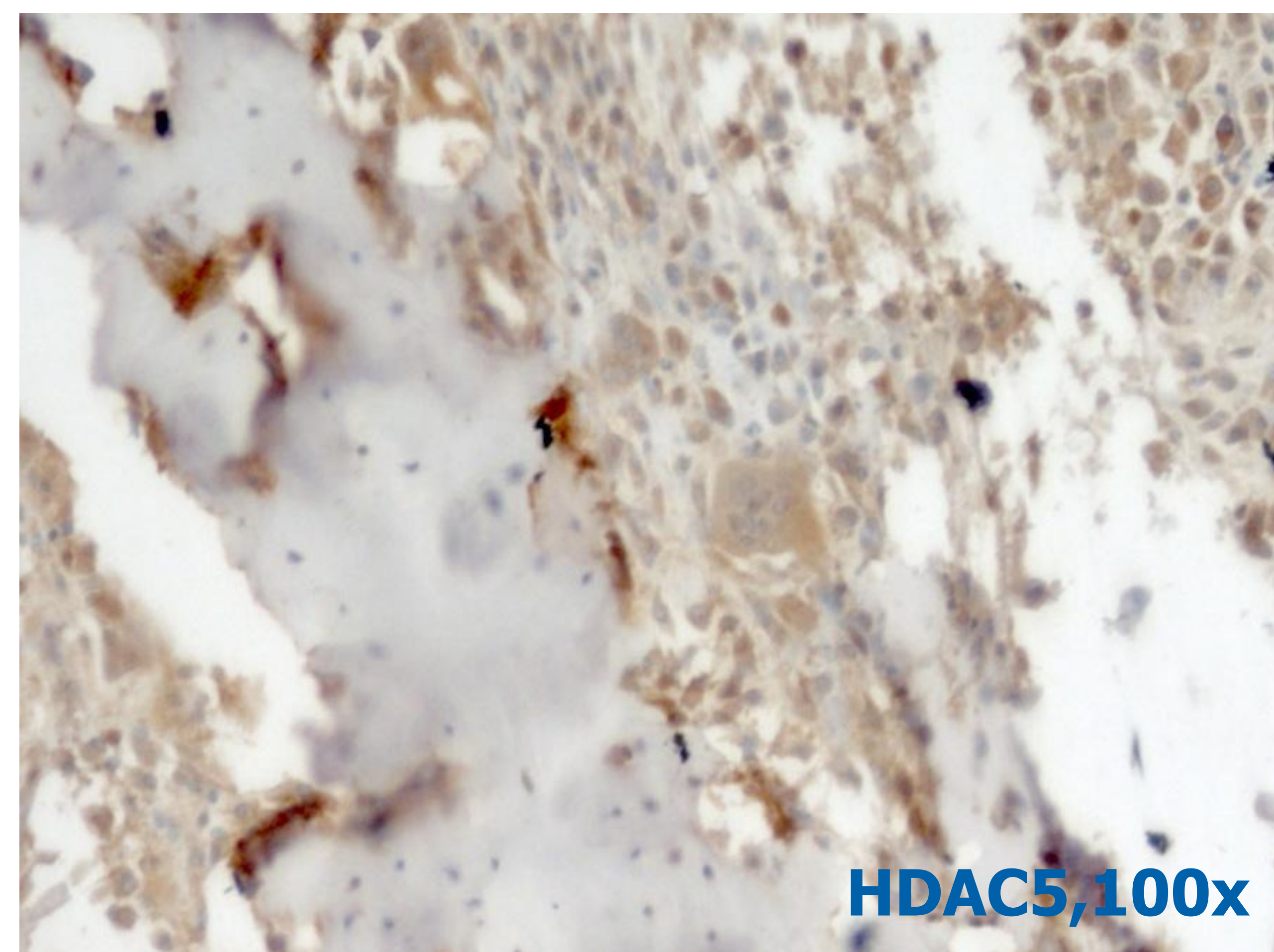
Introduction

Rheumatic arthritis is worldwide health problem with high prevalence and incidence. It is characterized by synovial inflammation, pannus formation and bone loss. Enhanced bone resorption is a consequence of osteoclast activation. It has been shown *in vitro* that enzymes influencing gene repression and transcription are influencing the process of osteoclast activation; among others histone deacetylases (HDAC). Histone deacetylases are divided into several classes; class I includes enzymes HDAC 1, 2, 3, and 8, while class II includes enzymes HDAC 4, 5, 7, and 9. Class I HDAC enzymes are found mostly in nucleus, while class II HDAC enzymes form complexes with various proteins in cytoplasm and shuttle between cytoplasm and nucleus. A 40-150 fold uprise of class II HDAC mRNA in activated osteoclasts has been shown *in vitro* (1).



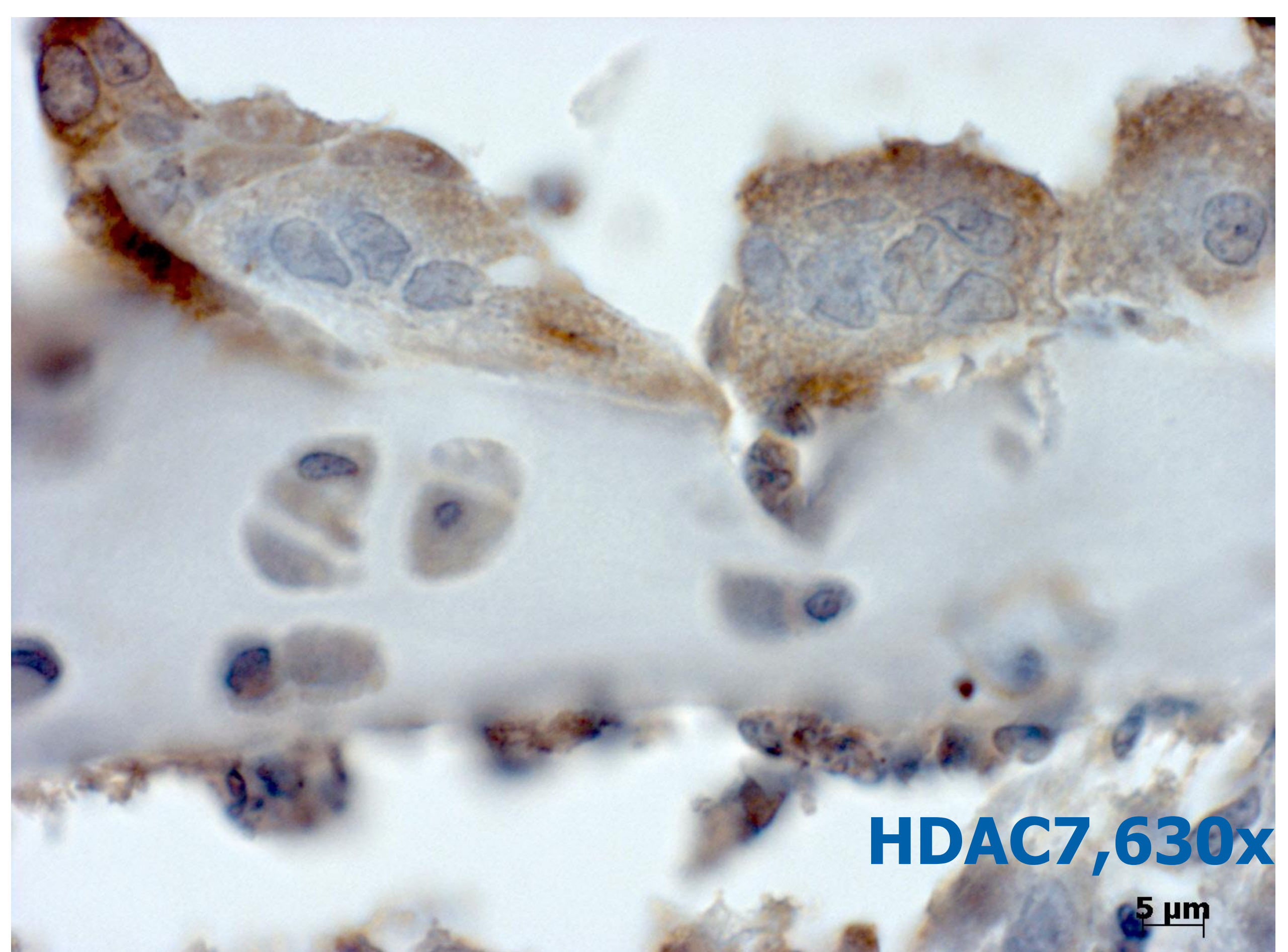
Objective

The aim of our study was to study expression of various class II HDAC enzymes in activated osteoclasts in a model of collagen induced arthritis (CIA) in rodents.



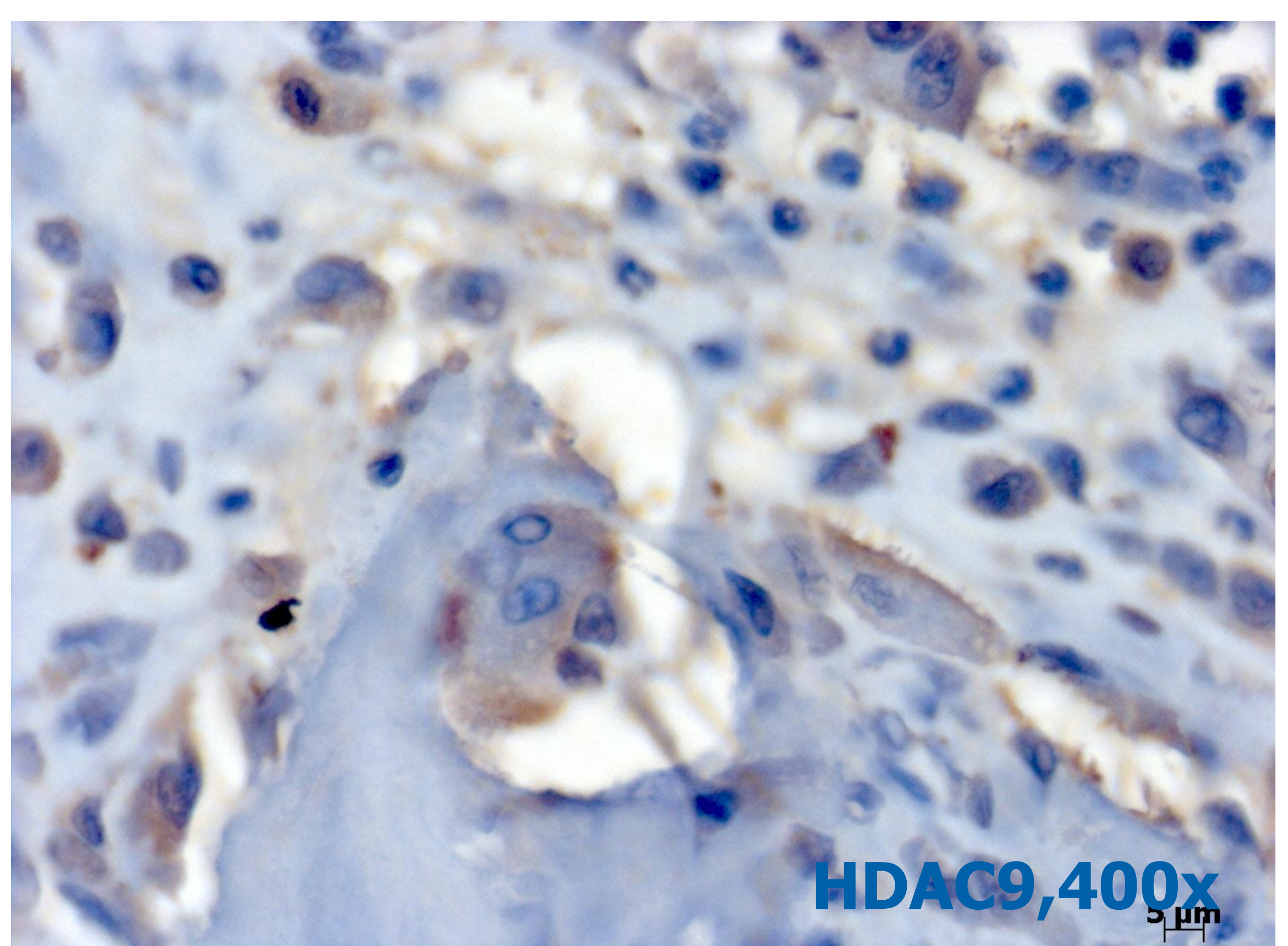
Materials and methods

Arthritis was induced with bovine type collagen-II (MdBiosciences) in Dark Agouti rats and DBA/J1 mice (Janvier, France), male, 5-6 weeks old. Animals were sacrificed two and four weeks following second collagen boost. Hind paws were put in formalin, decalcinated, paraffin embedded and stained for TRAP. Immunohistochemistry was performed using SantaCruz primary antibodies: HDAC5 (sc-11419), HDAC7 (sc-11493) and HDAC9 (sc-28732) followed by R&D systems' Cell and Tissue Staining Kit.



Results

Numerous TRAP-positive osteoclasts were found in majority of examined animals. HDAC5, HDAC7 and HDAC9 positive staining was found in osteoclast cytoplasm, nuclei remained negative. Osteoblasts were HDAC5, HDAC7 and HDAC9 positive as well.



Conclusion

The presence of HDAC class II enzymes has been shown in *in vivo* activated osteoclasts. They were predominantly situated in cytoplasm stressing their role other than regulation of gene transcription.

References

Cantley MD et al. Inhibitors of histone deacetylase in class I and class II suppress human osteoclasts *in vitro*. J Cell Physiol (2011) 226:3233-3241