seeded either on plastic or bone slices prior to irradiation to investigate their numbers and function. Osteoblasts (OB) were differentiated from mouse calvariae, irradiated and analysed regarding their differentiation and function using alizarin red stain and qPCR. Hind legs of *hTNF α* tg mice were locally irradiated with 0.5 Gy of X-rays and consecutively analysed using histomorphological methods and μ CT.

Results Treatment of OC with LD-RT (0.5–2 Gy) lead to decreased differentiation and function, while OB showed increased mineralization after irradiation with 0.5 Gy. Further, no significant increase of *Acp5* and *catk* at 0.5 Gy was found in OC while OB showed a dose-dependent decrease in *RANK-L* and increase in *OPG* expression. Also, OPG secretion by OB was enhanced at 0.5 Gy and 1 Gy. Histomorphometric analyses showed a decrease of erosive areas and OC numbers in the paws of irradiated animals, a finding that was confirmed in μ CT images.

Conclusions We conclude that LD-RT is not only a valuable tool for reduction of inflammation, but also has beneficial effects in restoring a balanced bone homeostasis through increased OB mineralization and decreased OC function. In the future, placebo controlled studies are desirable in order to investigate the effects of LD-RT with focus on osteoimmunology in RA in the clinic.

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HISTONE DEACETYLASE 1: A NOVEL THERAPEUTIC TARGET FOR PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction Despite enormous efforts to develop new therapeutic strategies for treatment of rheumatoid arthritis (RA), the large number of non responding patients to currently available drugs underlies the unmet need to identify new therapeutic targets. Certain CD4⁺T cells have been shown to be major drivers of inflammation in patients with RA. The expression of their key transcription factors is controlled by histone modifications which includes acetylation of *lysine residues* mediated by histone deacetylases (HDAC). Indeed, pan HDAC inhibitors have been shown to be a potential therapeutic strategy in the treatment of malignancies. However, major side effects limited the clinical use and underline the need of more specific HDAC inhibitors. Recent data suggest a role of HDAC1 on the migratory capacity and the differentiation of CD4⁺T cells in the context of autoimmune encephalitis.¹

Objectives Our aim was to elucidate the individual role of HDAC1 in a T cell dependent arthritis model, namely the collagen-induced arthritis model (CIA).

Methods Mice with a T cell specific deletion of HDAC1 (HDAC1 cKO) were generated by using the CD4Cre/LoxP system. At week 8 of age arthritis was induced in wild type

(WT) and HDAC1 cKO mice by immunising with chicken collagen II (CII), emulsified in complete Freund's adjuvant. The animals were scored for clinical signs of arthritis, namely paw swelling and grip strength. Anti-CII antibody levels were determined by ELISA. Various cell subsets, including Th cells, were detected in the blood, the spleen and the draining lymph node by FACS analysis. To test antigen-specific T cell activation we performed *in vitro* restimulation of spleen and lymph node cells with collagen II followed by assessment of cytokine production and quantification of the proliferation rate using ³H-thymidine incorporation. After 10 weeks mice were sacrificed and paraffin sections of the affected joints were analysed for histomorphologic signs of inflammation, cartilage and bone destruction.

Results Eighty percent of the animals developed serum anti-CII antibodies (IgM and IgG). No difference in the production of antibody subclasses, especially of pathogenic IgG2c antibodies, were observed between WT and HDAC1 cKO mice. Surprisingly, HDAC1 cKO mice were completely protected and did not develop any clinical signs of arthritis. Accordingly, histological analysis revealed no signs of inflammation, no bone erosion and no appearance of osteoclasts in the joints of HDAC1 cKO mice. In line with our recently published data on the role of HDAC1 on the differentiation and migration of T cell subsets we suggest that HDAC1 plays a key role in the development of arthritis.

Conclusions Our data show the importance of HDAC1 as a key immune regulator in the pathogenesis of T cell driven collagen induced arthritis. Therefore it might be considered as an interesting novel therapeutic target in RA.

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EFFECT OF DIFFERENT JANUS KINASE INHIBITORS ON FIBROBLAST-LIKE SYNOVIOCYTES IN RHEUMATOID ARTHRITIS

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Introduction In 2017, the Janus kinase inhibitors (JAKi) Tofacitinib and Baricitinib were approved for the treatment of Rheumatoid arthritis (RA) in the European Union (EU) by the European Medicines Agency (EMA). Other JAKi like Peficitinib, Filgotinib and Upadacitinib are currently examined in clinical trials. The effect of these substances is mainly based on blocking the IL-6 pathway in immune cells.¹ However the effect of the different JAKi on activated fibroblast-like synovocytes from patients with RA (RA-FLS) is not well characterised.

Objectives This study compared the effect of different JAKi on the pro-inflammatory response of activated RA-FLS.

Methods RA-FLS were isolated from synovial tissue of patients with known RA undergoing joint replacement surgery. The