**Methods**: NIR fluorescence imaging comprised 360 images/60 min. after injection of the dye. Analyses of patients with the clinical diagnosis of OA (n = 236) were compared with RA patients (n = 235), and patients diagnosed with autoimmune CTD (collagenoses) (n = 148). 17 features known to occur in FOI images were analyzed in both hands in three time periods (P1-3) after injection in two independent passes. In some cases, Prima Vista images (PVI), representing the sum of images 1-240 were also analyzed (n = 45, 33, 33 for OA, RA, CTD). Signals compared to the background were assessed as positive or negative (Figure 1). The data were analyzed statistically.

**Results**: Comparing the analyses of all phases of the OA cohort with those of the RA cohort, 14 of 51 features were identified as significantly different (p<0.05). The dye accumulation in metacarpophalangeal joints (MCP) has high specificity and diagnostic odds ratio (DOR) for RA patients (91%, 4.32). Patients in the OA cohort showed an increase in the signal at the muscle-tendon junction in the forearm (80% specificity, DOR 3.1). A comparison of the RA and CTD cohorts revealed 24 significant differences, most prominent changes in the nail bed in P1 (100% specificity, DOR 8.27) and a punctate accumulation pattern in P2 (88% specificity, DOR 2.61) for the CTD cohort. Comparing the RA and CTD cohorts, 22 features were significantly different. The strongest differences were found in the PIP joints of RA patients (78% sensitivity, DOR 2.97) and in the nail bed of CTD patients (100% specificity, DOR 8.18). In the cumulative PV images a high specificity for a secondary Raynaud’s syndrome in CTD patients was found as compared to RA (97%, DOR 1.77) and OA (91%, DOR 5.9). Further, DIP signals for OA comparing to CTD show significant differences (76% sensitivity, DOR 2.73).

**Conclusion**: The present work demonstrates the detection and localization of specific, significant features in NIR-FOI of patients with different rheumatic diseases and can thus make an important contribution to diagnosis and optimization of therapy. In future, multivariate analysis and artificial intelligence algorithms can combine these features to further improve the diagnostic value.

**Acknowledgements**: Funded by the Federal Ministry of Education and Research (grant nb.: 13GW0341A)