leakages in NC and VC groups but normal angiography in siSrc group. MicroCT revealed that the BMD and BV/TV of subchondral bone were significantly decreased in NC and VC while increased in siSrc group (7.7% of BMD and 9.3% of BV/TV) when compared to the baseline (p < 0.05). FEA showed higher stiffness (10.1%) and failure load (7.0%) of subchondral bone in siSrc group (p < 0.05). Histologically, appositional bone formation around the osteonecrotic lesion was classified as reparative osteogenesis, whereas fibrosis linked to necrotic bone resorption was classified as destructive repair. There was increased osteoblast surface (32.5%) and decreased eroded surface (56.2%) in siSrc group when compared to NC/VC (p < 0.05), while no significant difference was found in the osteoclast number, implying the function of Src siRNA in enhancement of osteoblasts and inhibition of osteoclast activities.

Conclusion: Multiple biomedical imaging evaluations demonstrated systematically that Src siRNA could be developed to prevent destructive repair in SAGN rabbits.

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ASSESSMENT OF CERVICAL LYMPHATIC DRAINAGE FUNCTION USING INDOCYANINE GREEN NEAR-INFRARED IMAGING IN RAT

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Objective: To assess the cervical lymphatic function of normal rats using an Indocyanine Green Near-Infrared (ICG-NIR) Imaging system.

Methods: ICG was injected into pharynx of the rats; the neck were illuminated with a 780-nm NIR laser to record the movement of ICG. There are five indicators to quantify lymphatic function (Figure 1): S-max; T-max; clearance of injection site and lymph nodes; T-max and the pulse of Lymph vessel (Figure 2).

Results: ICG and its transport within lymphatic vessels were readily visualized and quantified. ICG-NIR detected two lymphatic vessels and lymph nodes, and lymphatic pulses are in the vessels. After ICG was injected directly into a rat’s pharynx, the ICG signal accumulated at the site of injection and lymph nodes, peaked at 1 hour and decreased thereafter. At 24 hours, more than 90% of injected ICG disappeared from the injection site or lymph nodes. Lymph transfer within lymphatic vessels was carried out by muscle contraction, which could be detected by ICG-NIR as a form of lymphatic pulse. In this study, we detected lymphatic pulses within rat cervical lymphatic vessels, which was about 1.58 ± 0.20/min.

Conclusion: Our findings provide very useful information regarding the evaluation of cervical lymphatic function in rats using ICG-NIR lymphatic imaging system, which is critical for establishing a protocol with the throat inflammation condition of lymphatic function change.

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Figure 1. Quantitative assessment of ICG-NIR images to evaluate lymphatic draining function in the rat pharynx.