

1 Appendix A. Supplementary data

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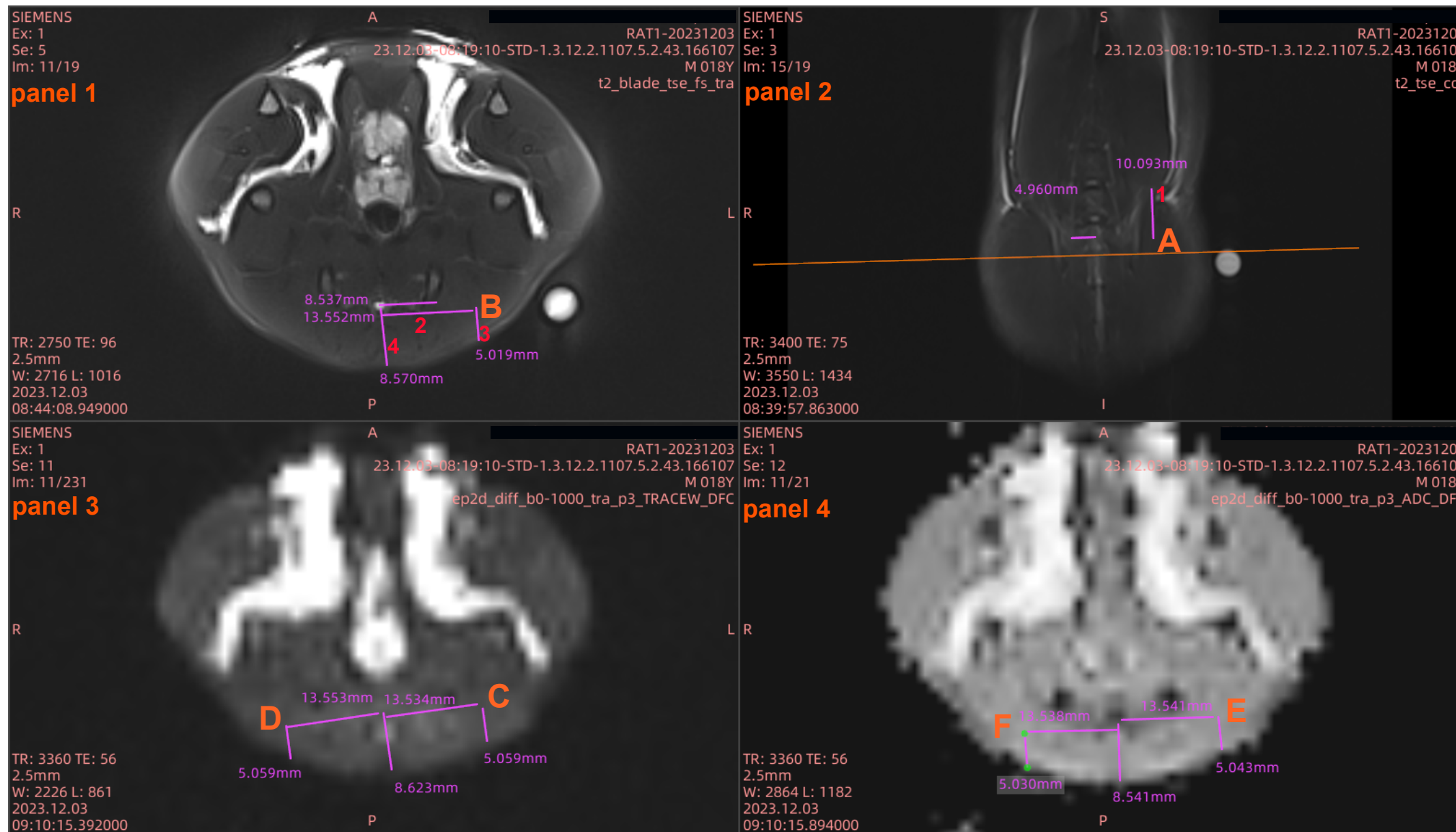
Supplementary table S1 The sequences and parameters of 3.0 T MRI system

parameters	T1WI	T2WI		DWI
	axial	transverse FS, Blade	coronary	axial (0, 10, 20, 40, 60, 80, 100,400, 600, 800, 1000 s/mm ²)
sequence	TSE	TSE		EPI
Repetition time (ms)	392	2750	3400	3360
Echo time (ms)	11	96	79	56
Field of view (mm)	120 × 120	120 × 120	120 × 120	84 × 120
Matrix (mm)	205 × 256	320 × 320	205 × 256	56 × 80
Slice thickness (mm)	2.5	2.5	2.5	2.5
Distance factor	20%	20%	10%	20%
Averages	4	1	4	1, 1, 1, 1, 2, 2, 3, 4, 4, 5, 6
Phase encoding direction	R>>L	R>>L	F>>H	A>>P
Phase oversampling	10%	12.5%	80%	50%
iPAT	GRAPPA: 2	GRAPPA: 2	GRAPPA: 2	GRAPPA: 2
Scan time	2min	2min56s	2min47s	4min37s
bandwidth	235Hz/pixel	226Hz/pixel	227Hz/pixel	1488Hz/pixel

Abbreviation: A, anterior; DWI, diffusion-weighted image; EPI, echo-planar imaging; F, foot; FS, fat suppression; GRAPPA, generalized autocalibrating partially parallel acquisitions; H, head; iPAT, integrated parallel acquisition techniques; L, left; P, posterior; R, right; T1WIs, T1-weighted images; T2WIs, T2-weighted images; TSE, turbo spin echo

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Supplementary Figure S2 The diagram for indicating the centers of ROIs



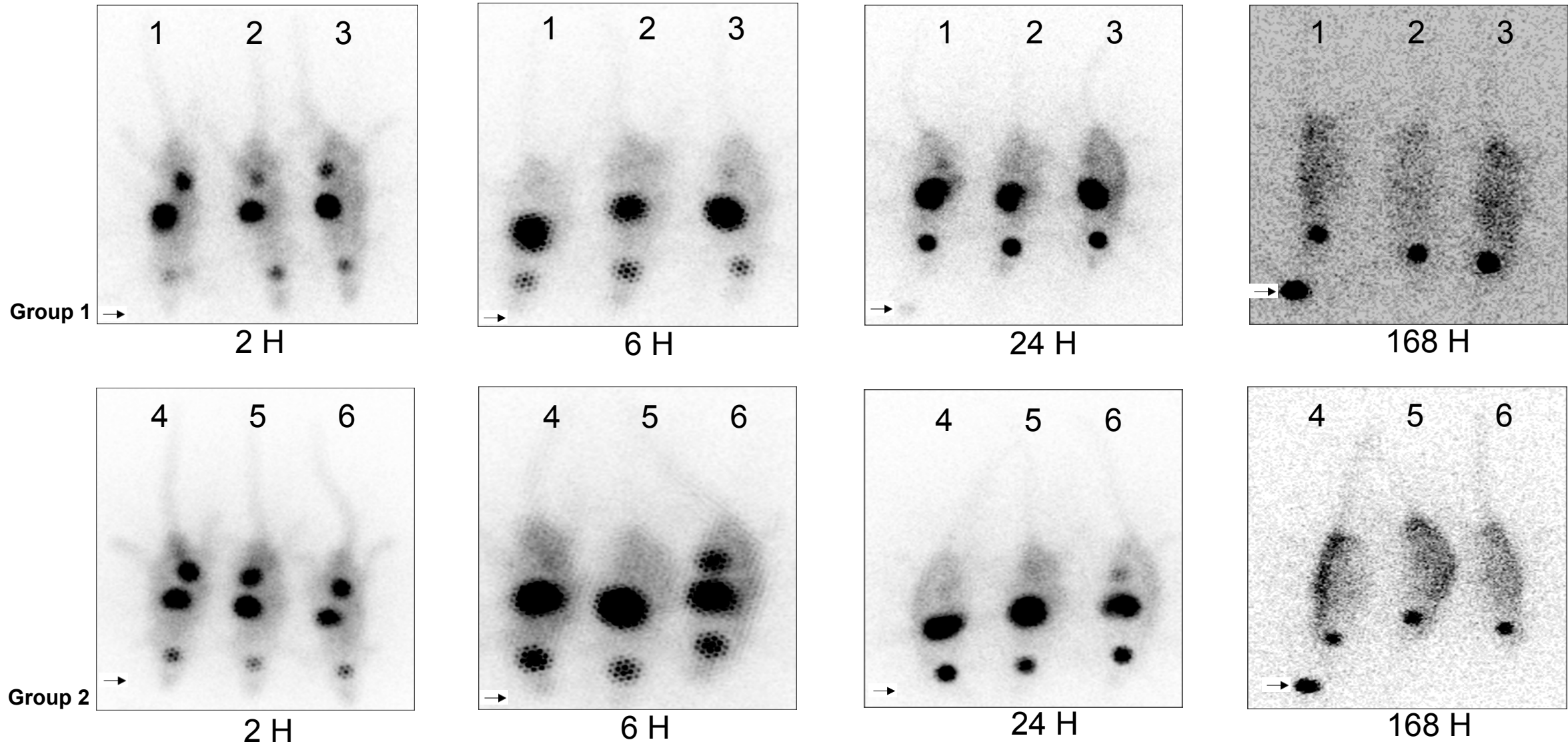
Supplementary Figure S2 the diagram for indicating the centers of ROIs

All the following measurements and key points were based on the real operation for injecting ^{131}I or NS into muscle. On T2WI coronal slice image, from the beginning point of iliac crest, a line segment No.1 parallel to lumbar was drew backwards, and the point A was the end point of the line segment. The line segment was about 10 mm long (in **panel 2**). Among T2WI transversal slice images, 3 images near to point A were chosen for confirming injection loci. On T2WI transversal slice images, from the beginning point of vertebral canal, the line segments No.2 vertical to lumbar were drew bilaterally (in the diagram, only unilateral line segment was displayed.), and the end points were 5 mm beyond the outer margin of iliac crest. Through the end points, a line segment No.3 vertical to the line segment No.2 was drew. From the beginning point of the skin surface, the line segment No.3 was 5 mm long. The crossed point of the line segment No.2 and the line segment No.3 was point B (in **panel 1**). From the vertebral canal to the skin surface, the line segment No.4 vertical to the line segment No.2 was drew. **Panel 3** and **panel 4** were DWI and ADC images respectively. Among DWI and ADC images, 3 images near to point A were chosen for confirming injection loci. In DWI and ADC images, the vertebral canal was confirmed using the same depth of the line segment No.4. The point C, D, E and F in panel 3 and panel 4 were confirmed by the same means as point B was confirmed. ^{131}I was injected into the point (B, C or E) close to the round marker which was adhered to the skin, and NS was injected into the contralateral point (D or F). In DWI and ADC images, above methods for confirming injection loci were also used for confirming the center of bone marrow ROIs. The muscle centers of background ROIs were 10 mm beyond the loci of ^{131}I being injected into. By the means, 2 background ROIs muscle centers were confirmed in every images. In T1WI and T2WI images, the confirmation of ^{131}I or NS injection centers was carried out by the same mean of that in DWI and ADC images. Because the margin of bone marrow in T1WI and T2WI images was clear, the confirmation of bone marrow ROIs neighboring injection loci was based on the margin of bone marrow. The ROIs diameters of injection loci, bone marrow or background were 6 mm, 3 mm or 3 mm, respectively.

For the convenience in illustration, the ratio of the MRI signal intensity in ^{131}I or NS injection locus, or in the corresponding bone marrow neighboring injection locus to background muscle MRI signal intensity were shorted as $\text{IMR}(= {}^{131}\text{I}_m/\text{muscle}$, that is, the ratio of MRI signal intensity in ^{131}I injection locus to that in background muscle.), $\text{NMR}(= \text{NS}_m/\text{muscle}$, that is, the ratio of MRI signal

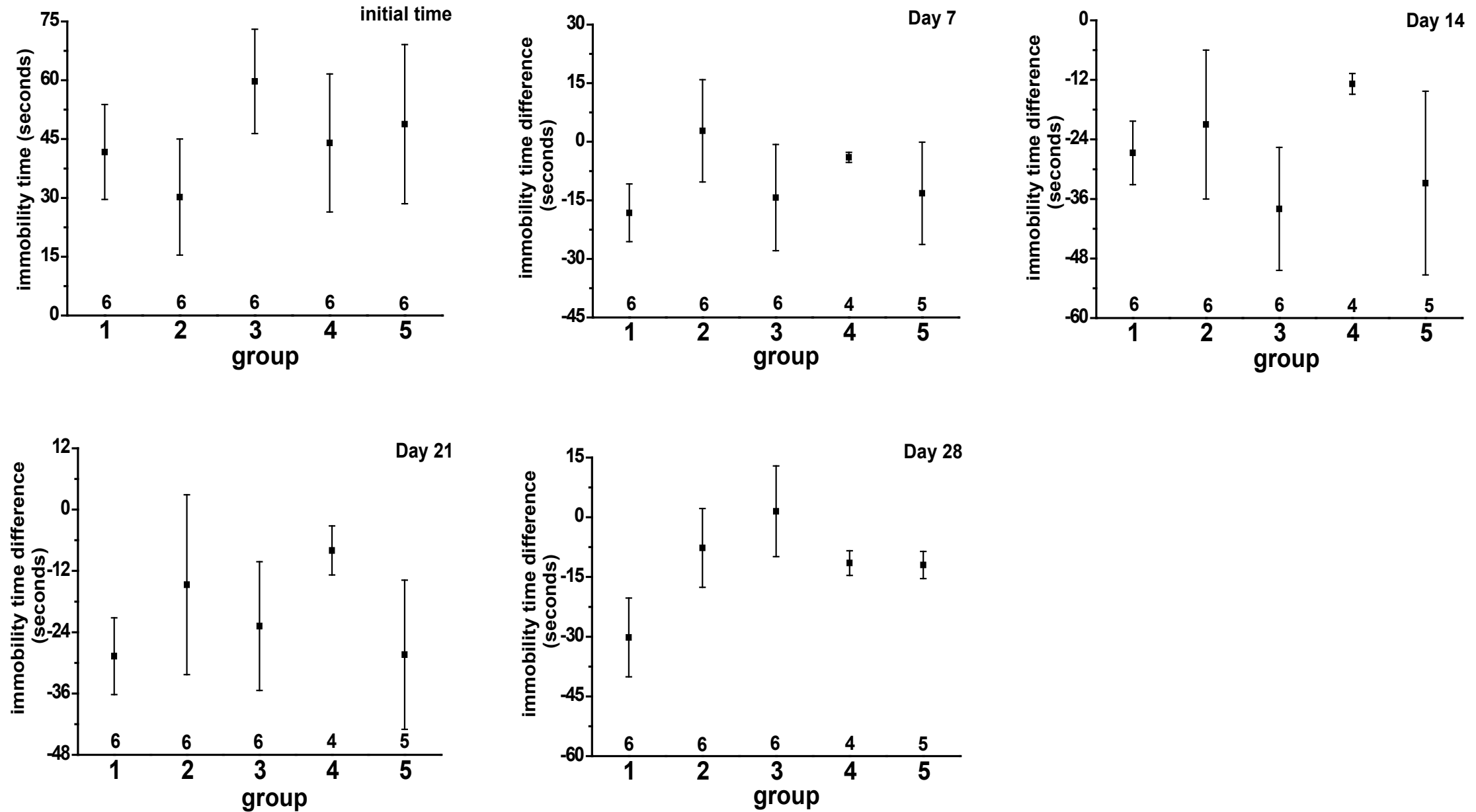
35 intensity in NS injection locus to that in background muscle.), $IBR(= {}^{131}I_b/\text{muscle}$, that is, the ratio
36 of MRI signal intensity in bone marrow neighboring ${}^{131}I$ injection locus to that in background
37 muscle.) and $NBR(= NS_b/\text{muscle}$, that is, the ratio of MRI signal intensity in bone marrow
38 neighboring NS injection locus to that in background muscle.), respectively.

Supplementary figure S3 the ^{131}I iodine metabolism post injection in muscle



40 **Supplementary figure S3** the ^{131}I metabolism post injection in muscle
41 Digits 1-6 represent rat numbers. Group 1 or group 2 consists of rat 1-3 or rat 4-6 respectively. The
42 rats in group 1 or group 2 were injected 0.25 mCi or 0.75 mCi ^{131}I /Kg weight respectively. 2H, 6H,
43 24H and 168H were the time points post injecting ^{131}I in muscle. Arrows indicate the ^{131}I labels in
44 syringes for localization. mm: millimeter. H: hour. ml: milliliter. mCi: millicurie.

Supplementary figure S4 the swim test



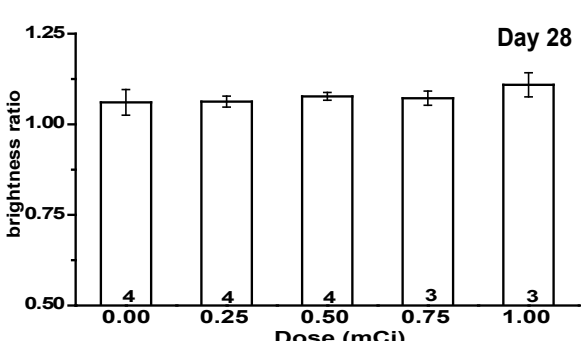
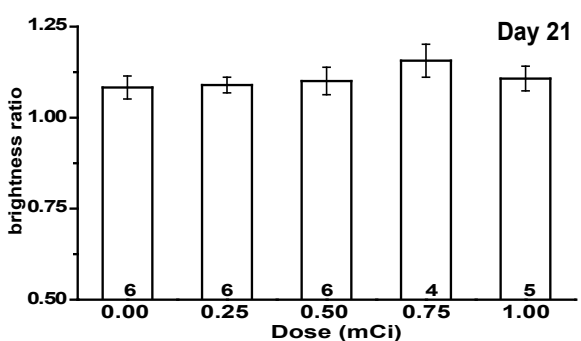
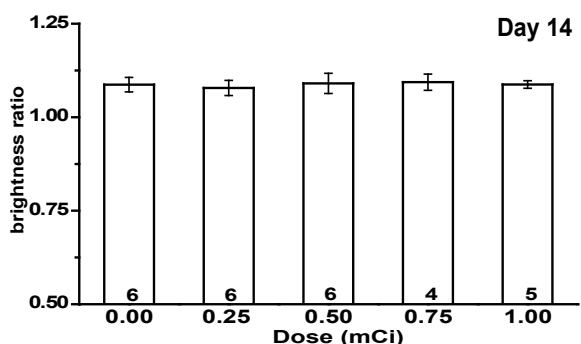
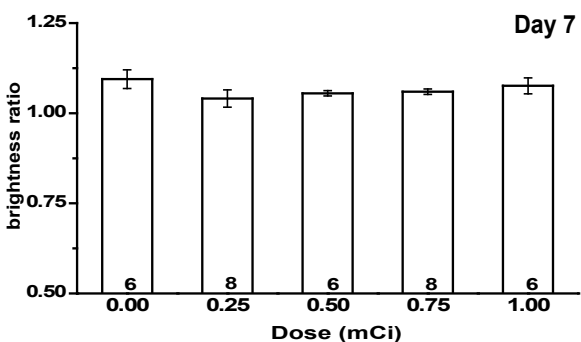
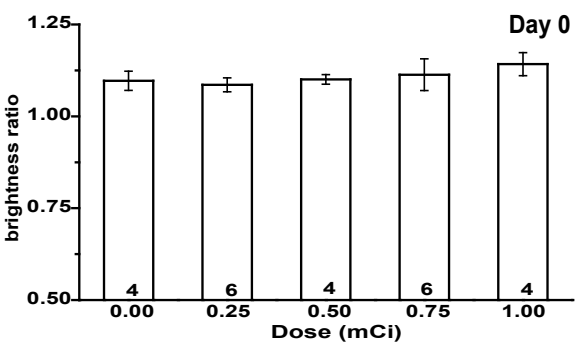
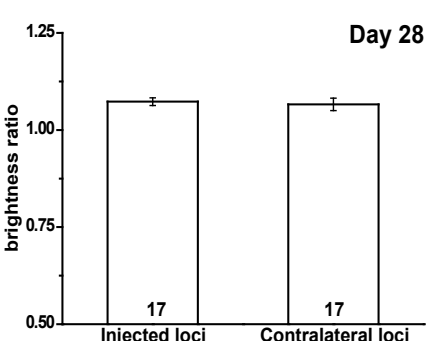
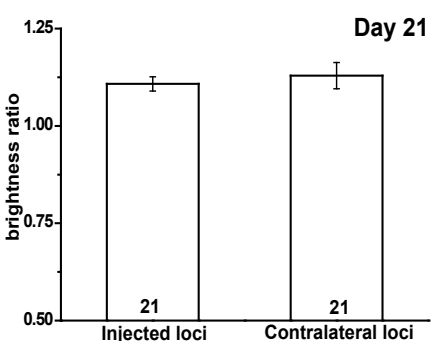
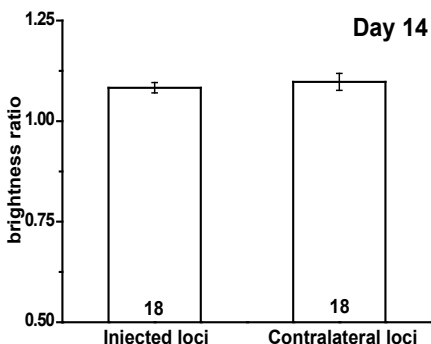
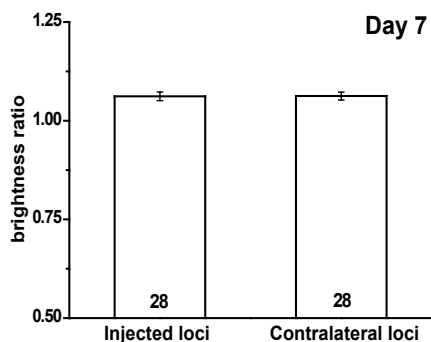
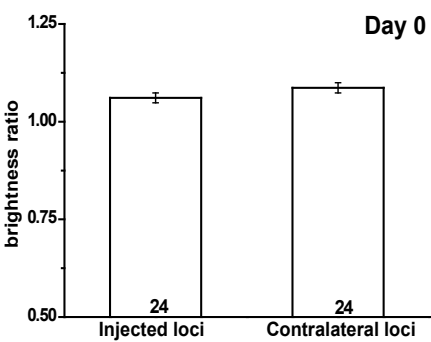
46 **Supplementary figure S4** the change of the immobility time in swim test
47 Before injecting ^{131}I into muscle, all rats swam initially in water for 5 minutes. In the course of
48 initial swim, the immobility time in water was not significantly different among 5 group rats. On
49 day 7, 14, 21 and 28 after injecting ^{131}I into muscle, all rats also swam in water for 5 minutes for
50 testing the immobility time difference. In water, the immobility time difference between the test day
51 and initial time was not significantly different among 5 group rats. The digits on the horizontal axes
52 indicate the rat quantity of the corresponding group.

Supplementary figure S5

the comparison of skin injury

the paired t-test

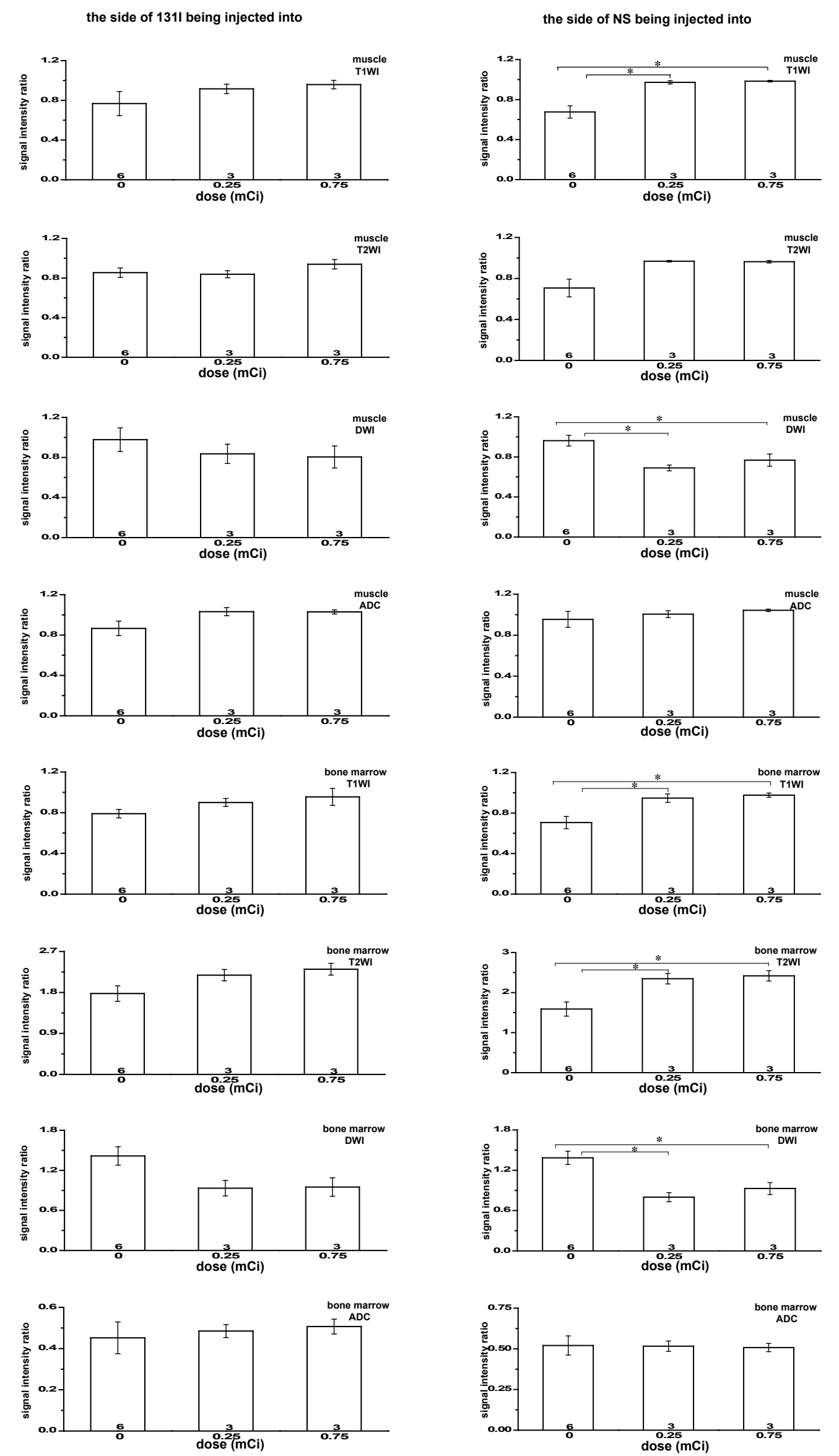
the one-way ANOVA



54 **Supplementary figure S5** the injury of skin near the injection loci
55 On day 0, 7, 14, 21 or 28 post injecting ^{131}I or NS into rats muscle, the brightness ratios of skin were
56 compared. The brightness ratios between the ^{131}I injection loci sides and the contralateral NS
57 injection loci sides were not significantly different in paired t-test with $t > -1.33$ and $P > 0.196$ (in
58 the **left column**). The brightness ratios at the ^{131}I injection loci among ^{131}I dose 0, 0.25, 0.50, 0.75
59 and 1.00 mCi/Kg weight group were not significantly different in one way ANOVA with $F < 0.913$
60 and $P > 0.469$, and all $P > 0.05$ in post hoc SNK test (in the **right column**). The digits on horizontal
61 axes indicate the rat quantity of the corresponding group.

Supplementary figure S6

On day 7 post injecting 131I or NS into muscle, the one-way ANOVA of MRI signal intensity ratios



Supplementary figure S6 On day 7 post injecting NS or ^{131}I into muscle, the one-way ANOVA of MSIRs at the muscle loci where ^{131}I or NS had been injected, or at the neighboring bone marrow. In T1WI images, at the muscle loci where NS had been injected or the neighboring bone marrow, the MSIR in control group was significantly lower than that in the group 0.25 or 0.75 mCi $^{131}\text{I}/\text{Kg}$ weight had been injected into muscle (post hoc $P < 0.05$), and so was in T2WI images at bone marrow near to the muscle NS had been injected into. However, in DWI images at NS injection sides, the MSIR in control group was significantly higher than that in both group in which ^{131}I had been injected into muscle (post hoc $P < 0.05$). In T1WI, T2WI, DWI and ADC images, the above difference didn't exist in the muscle where ^{131}I had been injected or in the neighboring bone marrow, and so was in ADC images at the muscle loci where NS had been injected or in the neighboring bone marrow. The digits on the horizontal axes indicate the rat quantity of the corresponding group. *, $p < 0.05$.