

## Supplementary information for

### Osteoinduction and long-term osseointegration promoted by combined effects of nitrogen and manganese elements in high nitrogen nickel-free stainless steel

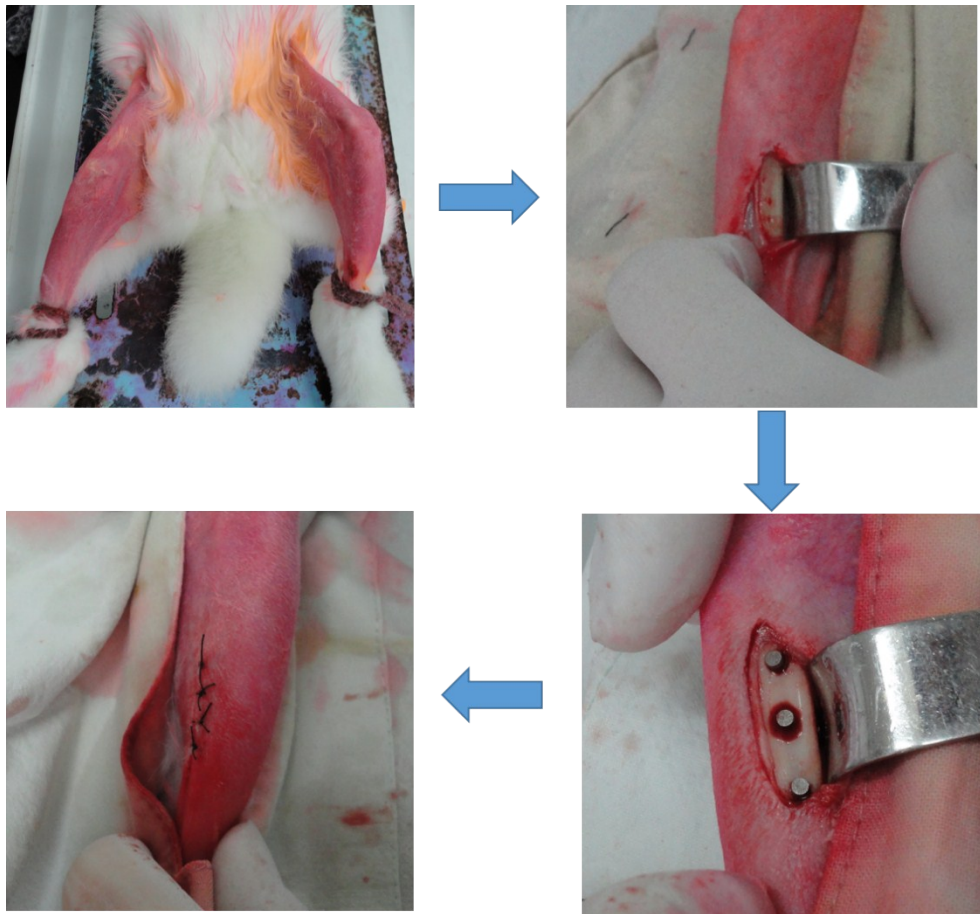
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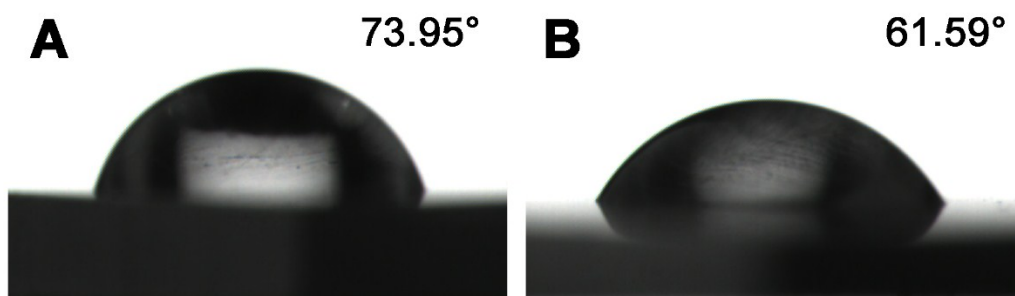
**Table S1.** Primers used for real time RT-PCR.

Gene	Forward primer sequence (5'-3')	Reverse primer sequence (5'-3')
GAPDH	GGCAAGTTCAACGGCACAGT	GCCAGTAGACTCCACGACAT
Integrin $\alpha$ 1	AGCTGGACATAGTCATCGTC	AGTTGTCATGCGATTCTCCG
Integrin $\beta$ 1	AATGTTTCAGTGCAGAGCC	TTGGGATGATGTCGGGAC
RUNX-2	GCTTCTCCAACCCACGAATG	GAACTGATAGGACGCTGACG A
ALP	CGGAAGTGAGGCAGGTAG	AGAGCCCACAATGGACAG
OPN	TGGATGAACCAAGCGTGGA	TCGCCTGACTGTCGATAGCA
OCN	GTGCCGTCCATACTTTCG	GACCACATTGGCTTCCAG

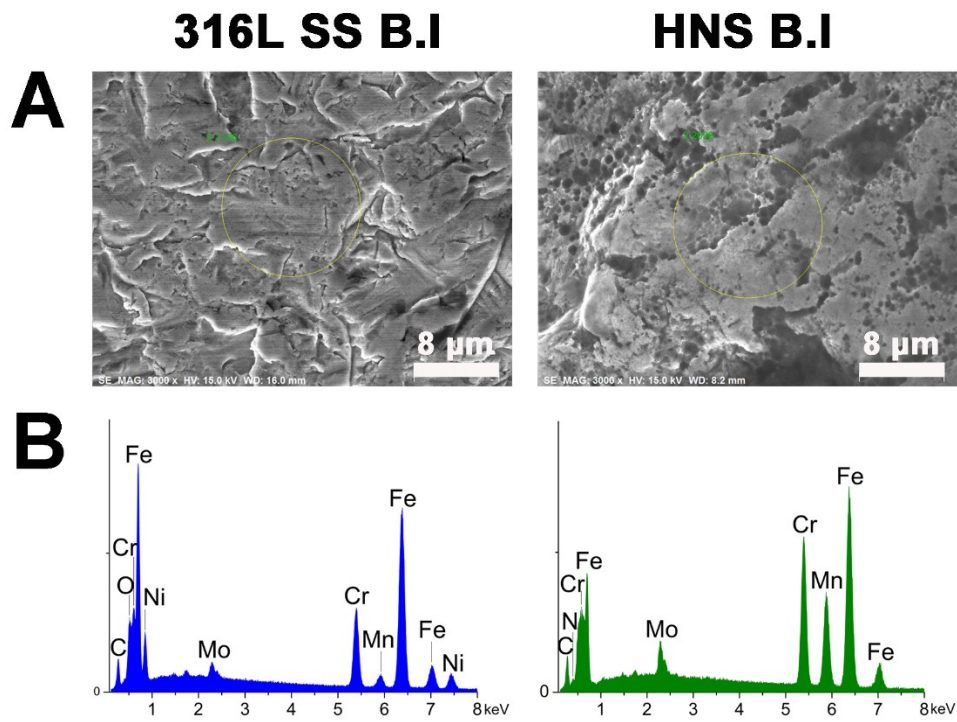


**Figure S1.** Surgical implantation procedure:

Rabbits were injected intramuscularly with ketamine at a dose of 0.5 mg/kg. After the midshaft of tibia was exposed, three holes ( $\Phi 2.2$  mm, 10 mm apart) were prepared perpendicularly at the specific site. Three implants of each material (HNS and 316L SS) were inserted into left and right tibiae respectively and then the surgical wounds were sutured closely.



**Figure S2.** Water contact angle images of (A) 316L SS and (B) HNS.



**Figure S3.** Morphology and element composition of 316L SS and HNS surfaces before implantation (B.I). (A) SEM top-view of surface microstructures; (B) EDS spectra of the circular region in corresponding SEM images.