

Supporting information

Smart Bacterial Magnetic Nanoparticles for Tumor-Targeting Magnetic Resonance Imaging of HER2-Positive Breast Cancers

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Protein sequence

The amino acids of MamC protein from *Magnetospirillum gryphiswaldense* MSR-1:

MSFQLAPYLAKSVPGIGILGGIVGGAAALAKNARLLKDKQITGTEAAIDTGKEAA

GAGLATAFSAVAATAVGGGLVVSLGAALIAGVAAKYAWDLGVDFIEKELRHGK

SAEATASDEDILREELA; The amino acids of HER2 affibody with Histag and two

cysteines: ATVDNKFNKELRQAYWEIQALPNLNWTQSRAFIRSLYDDPSQ

SANLLAEAKKLNDAPKGS SHHHHHHCC. The protein sequences of MamC-HAF

and MamC-THAF were listed as the following:

MamC-HAF:

MSFQLAPYLAKSVPGIGILGGIVGGAAALAKNARLLKDKQITGTEAAIDTGKEAA

GAGLATAFSAVAATAVGGGLVVSLGAALIAGVAAKYAWDLGVDFIEKELRHGK

SAEATASDEDILREELAGGGGSGGGGSGGGGSATVDNKFNKELRQAYWEIQALP

NLNWTQSRAFIRSLYDDPSQSANLLAEAKKLNDAPKGS SHHHHHHHCC.

MamC-THAF:

MSFQLAPYLAKSVPGIGILGGIVGGAAALAKNARLLKDKQITGTEAAIDTGKEAA

GAGLATAFSAVAATAVGGGLVVSLGAALIAGVAAKYAWDLGVDFIEKELRHGK

SAEATASDEDILREELAGGGGSGGGGSGGGGSATVDNKFNKELRQAYWEIQALP

NLNWTQSRGSSHHHHHHCC.

Gene sequence

The optimized gene sequence of MamC (black color) , glycine-glycine-cysteines(low-case letter), HER2 affibody (red color) with 6 × Histags (blue color) and three cysteines (purple color) for protein expression in *E.coli* BL21:

ATGAGCTTTCAGCTGGCACCGTATCTGGCCAAAAGTGTGCCGGGTATTGGCA
TTCTGGGTGGTATTGTTGGCGGTGCAGCCGCACTGGCAAAAAATGCCCGCCT
GCTGAAGGACAAACAGATTACCGGCACCGAAGCCGCCATTGATACCGGTAA
AGAAGCAGCCGGTGCAGGTCTGGCAACCGCCTTTAGCGCAGTTGCAGCCACC
GCAGTGGGTGGTGGTCTGGTGGTGAGTCTGGGTGCAGCCCTGATTGCAGGTG
TGGCCGCCAAATATGCCTGGGATCTGGGCGTGGACTTCATCGAAAAGGAACT
GCGCCACGGTAAAAGCGCCGAAGCCACCGCCAGCGATGAGGATATTCTGCGC
GAAGAACTGGCCggcggcgggcggcagcggcgggcggcgggcagcggcgggcgggcggcagcGTGGATAA
TAAATTTAACAAAGAACTGCGCCAGGCCTATTGGGAAATTCAGGCCCTGCCG
AATCTGAATTGGACCCAGAGCCGCGCCTTTATCCGCAGCCTGTATGATGATCC
GAGCCAGAGCGCCAACCTGCTGGCCGAAGCCAAAAAACTGAACGATGCCCA
GGCCCCGAAAGGCAGCAGCCATCACCATCATCATCATAGCAGCGGCTGCTGC
TGCggcagcagcCATCACCATCATCATCATTTGCTGCTGA

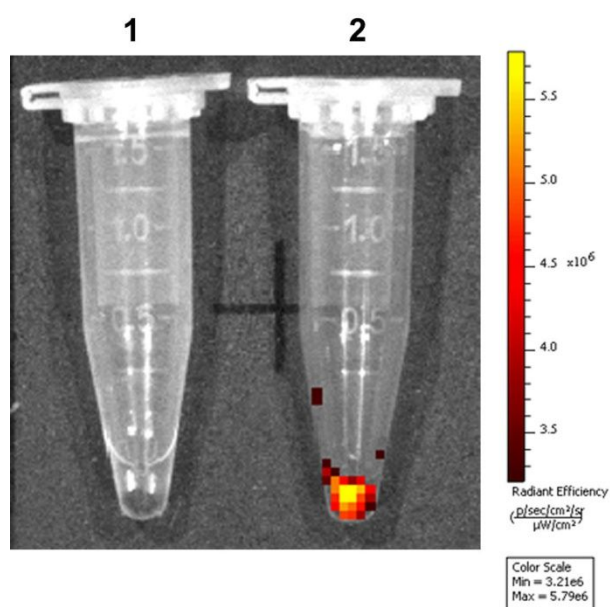


Figure S1. Cy5.5 conjugated BMW-HAF. Maleimide derivative cyanine dyes were incubated with BMW-HAF without (1) or with (2) the thiol groups for 3 h. The pellets were washed using PBS for 3 to 5 times and imaged through using the IVIS Spectrum System.

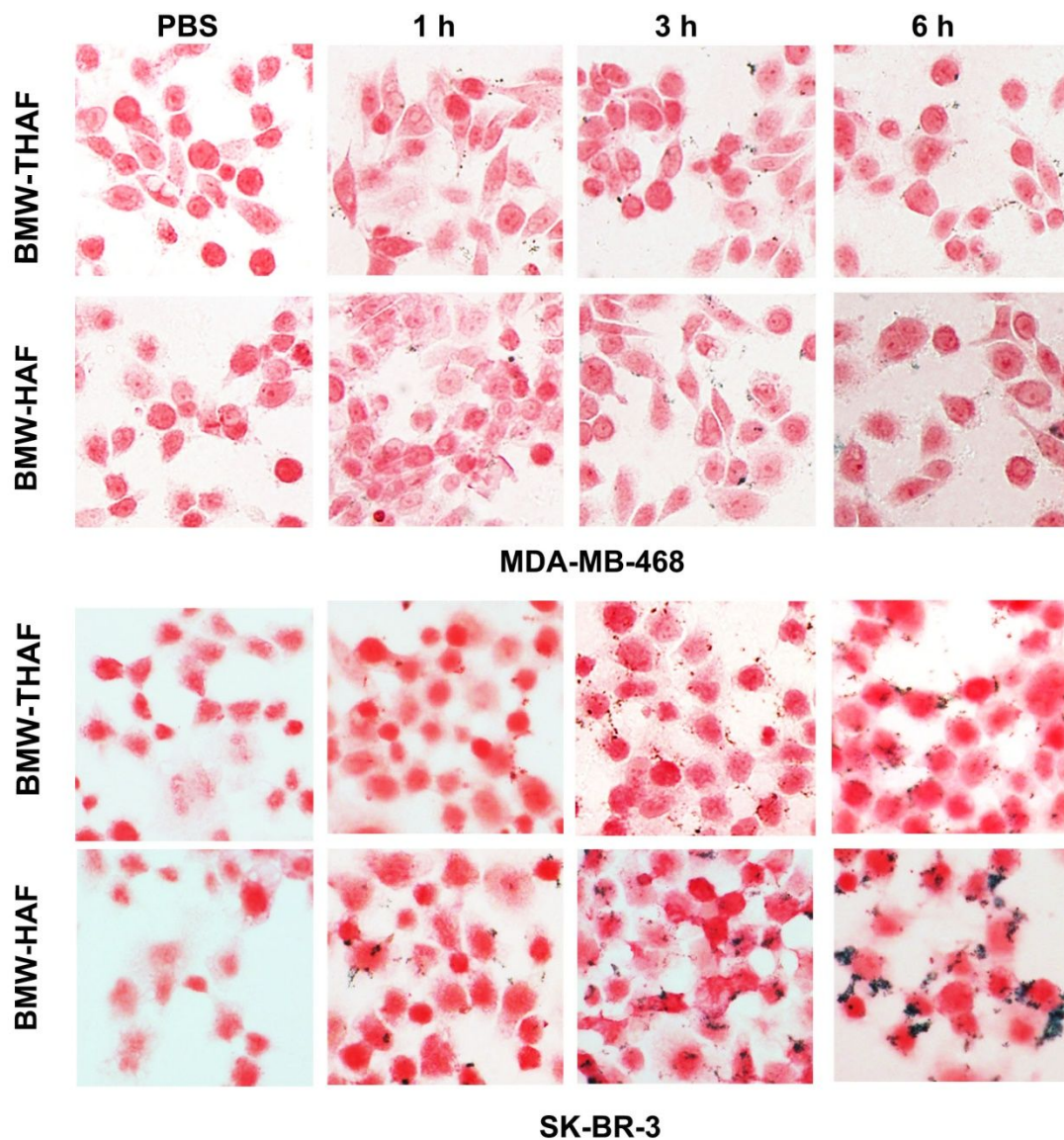


Figure S2. Prussian blue staining of iron in the breast cancer cells. MDA-MB-468 and SK-BR-3 cells incubated with BMW-HAF and BMW-THAF for 1 h, 3h and 6 h under cell culture condition. At a defined time, the cells were stained by using Prussian blue staining and captured under microcopy.

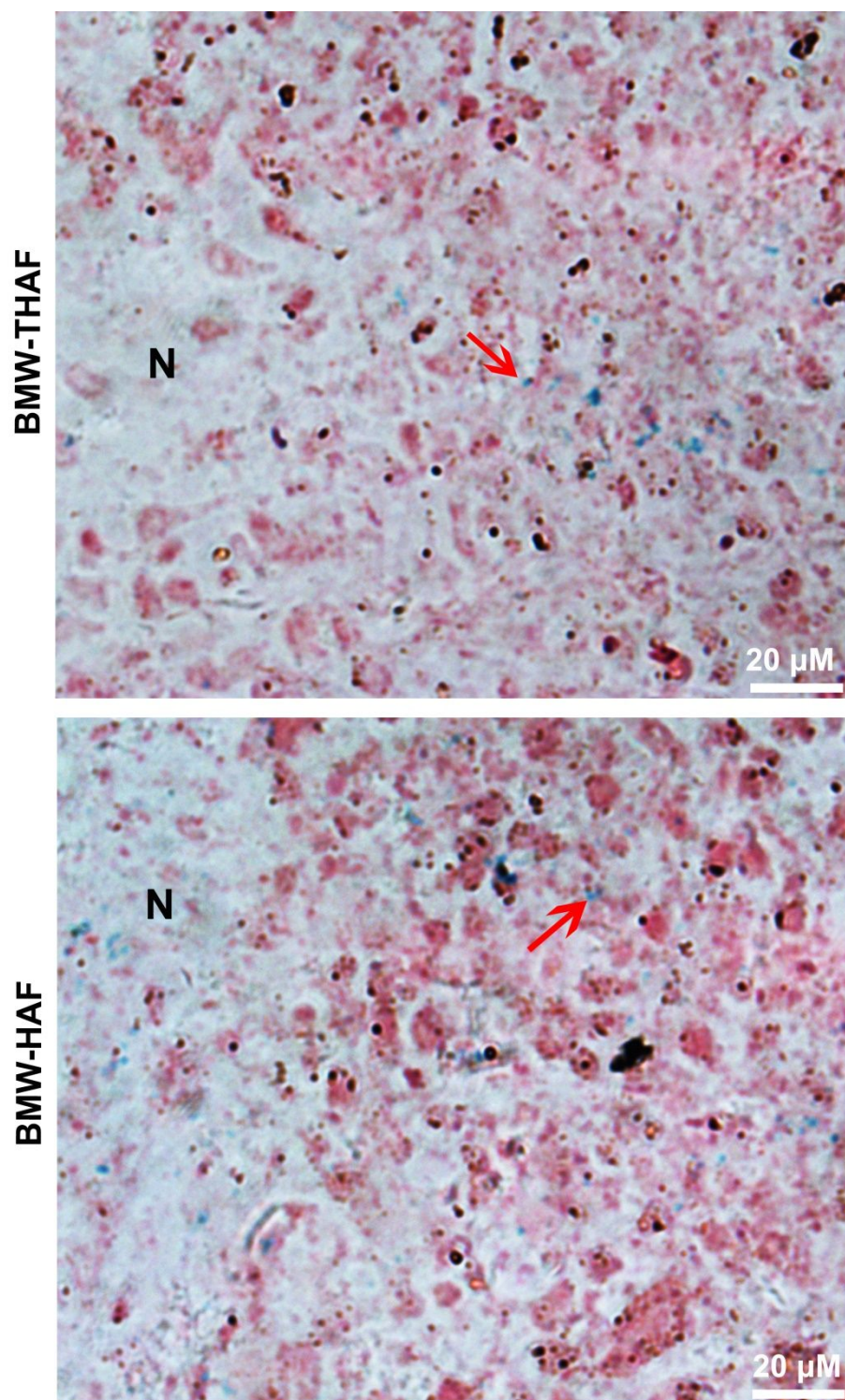


Figure S3. Localization of iron in the tumor sections. The mice bearing SK-BR-3 tumors were i.v. administrated with BMW-HAF or BMW-THAF. The tumors were excised after

24 h and stained through using Prussian blue staining. Blue point indicates the iron; N stands for necrosis.

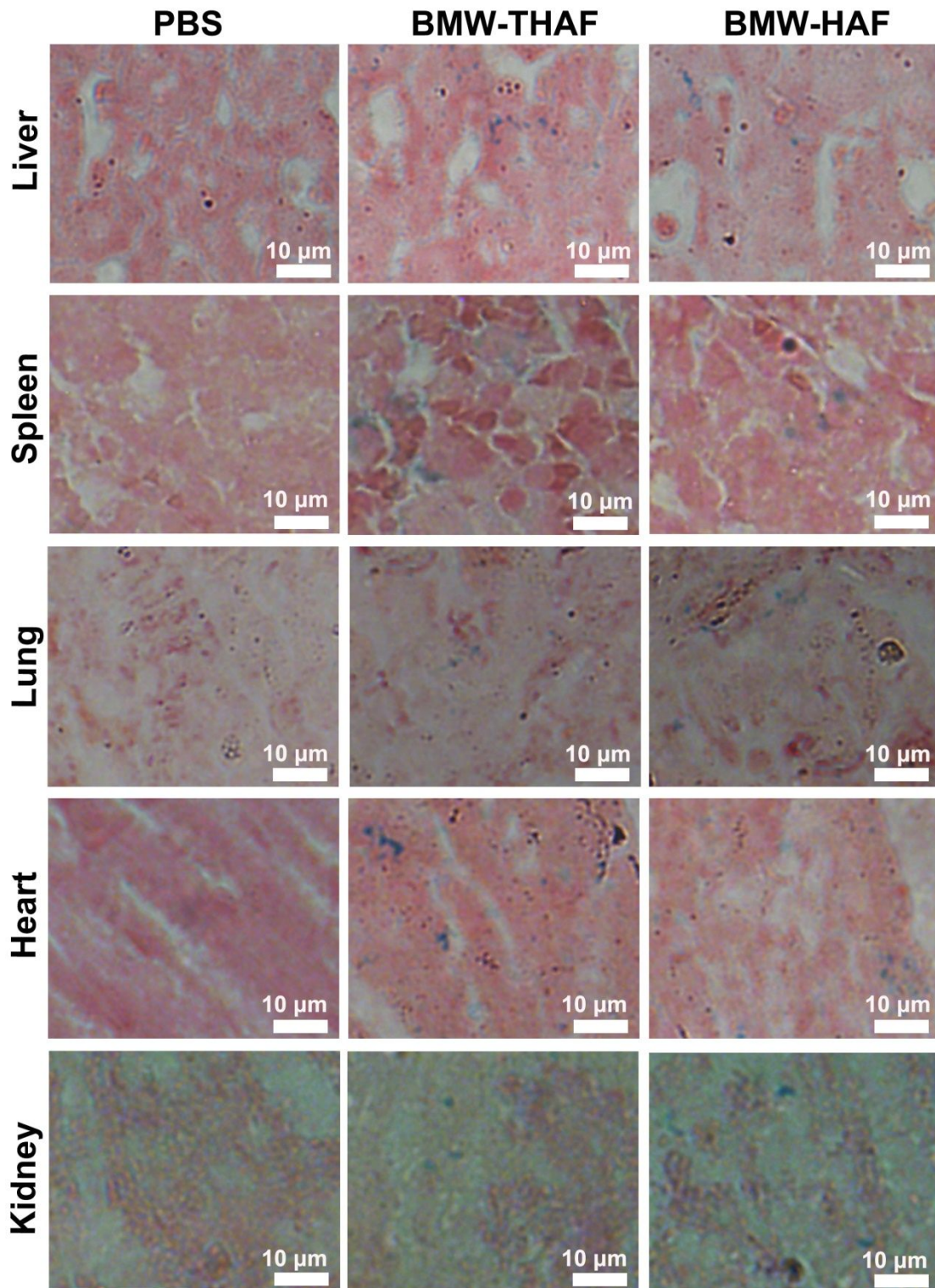


Figure S4. Prussian blue staining of iron in different organs. The mice bearing SK-BR-3 tumors were i.v. injected of BMW-HAF. The livers, spleens, lungs, hearts and kidneys were stained by using Prussian blue staining. Blue point indicates the iron.

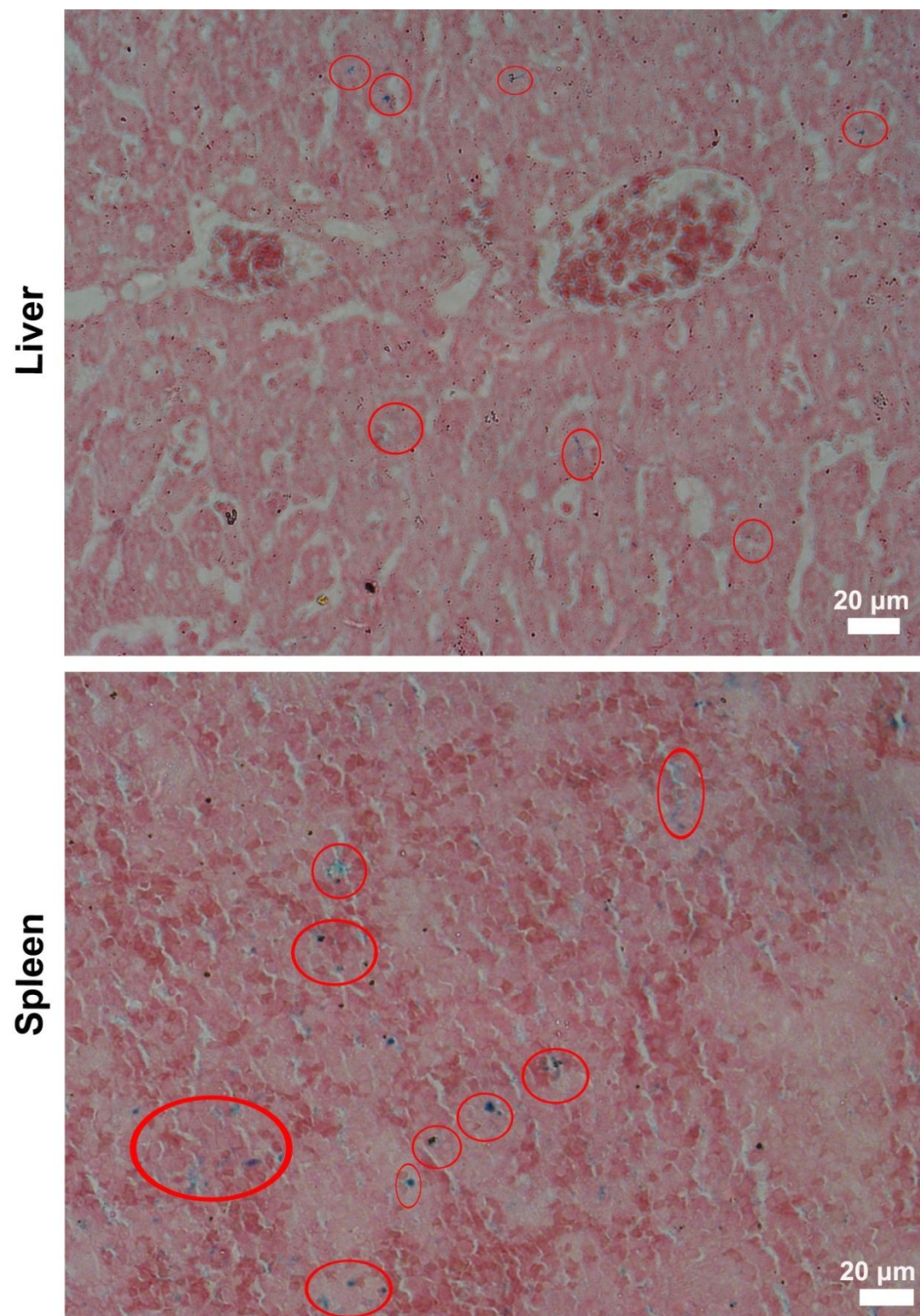


Figure S5. Localization of irons in the liver and spleen. The mice bearing SK-BR-3 tumors were i.v. injected of BMW-HAF. The sections of livers and spleens were stained

by using Prussian blue staining. The blue point in the red circle stands for irons.