

Supplementary Information for
Modulating the permeability of the ferritin channels

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CLUSTAL O(1.2.1) multiple sequence alignment

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HuLFtn      -----SSQIRQNYSTDVEAAVNSLVNLYLQA
HuHFtn      -----TTASTSQVRQNYHQDSEAAINRQINLELYA
RcH' Ftn    -----MVSQVRQNYHSDCEAAVNRMLNLELYA
SFtn4      AKGSTNHRALTGVI FEPFEEVKKELDLVPTVPQ--ASLARQKYVDESES AVNEQINVEYNV
UpFtn      -----AQEVTGMVFQPFSEVQGELSTVTQAPVTD SYARVEYHIECEAAINEQINIEYTI
EcFtnA     -----MLKPEMIEKLNQMNLELYS
TM1128Ftn  -----MGSDKIHSHHHMMVISEKVRKALNDQLNREIYS
Pfftn      -----MLSERMLKALNDQLNRELYS
              : * : *

HuLFtn      SYTYLSLGFYFDRDDVALEGVSHFFRELAEEKREYERLLKMQNQRRGGRALFQDIKKPA-
HuHFtn      SYVYLSMSYFFDRDDVALKNFAKYFLHQSHHEEREA EKLMKLQNRGGRIFLQDIKKPD-
RcH' Ftn    SYTYSSMYAFFDRDDVALHNVAEFFKESHEEREA EKFMKYQNRGGRVVLQDIKKPD-
SFtn4      SYVYHAMFAYFDRDNVALRGLAKFFKESSEEREA EKLMQYQNRGGRVQLQSI VMPPLS
UpFtn      SYVYHALHSYFARDNVGLPGFAKFFKEASDEEREA HMLMDYQTKRGGRVELKPLAAPEM
EcFtnA     SLLYQQMSAWCS--YHTFEGAAFLRRHAQEEMTMQRLFDYLD TGNLPRINTVESPFP-
TM1128Ftn  SYLYLSMATYFD--AEGFKGF AHWMKKQAQEELTAMKFYEYI YERGGRVELEAIEKPP-
Pfftn      AYLYFAMAAYFE--DLGLEGFANWMKAQAE E EIGHALRFYNYI YDRNGRVELDEIPKPP-
              : * : : : : : : : : : : : : : : : : : : : : : : : : : : *

HuLFtn      ---EDEWGKTPDAMKAAMALEKKLNQALLDLHALGSARTDPHLCDFLETHFLDEEVKLIK
HuHFtn      ---CDDWESGLNAMECALHLEKNVNQSLLELHKLATDKNDPHLCDFIETHYLNEQVKAIAK
RcH' Ftn    ---RDEWGNTLEAMQALQLEKTVNQALLDLHKLATDKVDPHLCDFLESEYLEEQVKDIK
SFtn4      DFDHADKGDALHAMELALSLEKLTNEKLNLSVATKNGDVQLAD FVEYTYLGEQVEAIAK
UpFtn      EFANDDKGEALYAMELALSLEKLNFKLQALQAIADKHKDAALCDFVEGGLLSEQVDAVK
EcFtnA     ---AEYSSLDEL FQETYKHEQLITQKINELAHAAMTNQDYPTFNFLQ--WYVSEQHEEEK
TM1128Ftn  ---SNWNGIKDAFEAALKHEEFVTQSIYNI LELASEEKDHATV SFLK--WFVDEQVEEED
Pfftn      ---KEWESPLKAFEAAAYEHEKFI SKSIYELALAE E EKD YSTRAFLE--WFINEQVEEEA
              : : : : * : : : : . . * * : : * : .

HuLFtn      KMGDHLTNLHRLGGPEAGLGEYLFERLTLKHD-----
HuHFtn      ELGDHVTNLRRKMGAPESGLAEYLFDKHTLGDSDNES-----
RcH' Ftn    RIGDFITNLKRLGLPENMG EYLFDKHSVKESS-----
SFtn4      RISEYVAQLRRVG---KGGVWFHDQMLLHEGGDAA-----
UpFtn      EHAVYVSQ LRRVG---KGVGVYLLDQELGEEA-----
EcFtnA     LFKSIIDKLSLAGK--SGGLYFIDKELSTLDTQN-----
TM1128Ftn  QVREILDLEKANG--QMSVIFOLDRLYLGQRE-----
Pfftn      SVKILDKLKFAD--SPQILFLDKEL SARAPKLPGLLMQGG E
              : * : : :

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Acronym	Protein	PDB ID
HuLFtn	Human L ferritin	2FG8
HuHFt	Human H ferritin	3AJO
RcH' Ftn	Rana catesbeiana H' ferritin	4DAS
SFtn4	Soybean ferritin	3A68
UpFtn	Ulva pertusa Ferritin	3VNX
EcFtnA	Escherichia coli	1EUM
TM1128Ftn	Thermotoga maritima ferritin	1VLG
Pfftn	Pyrococcus furiosus ferritin	2JD6

Figure S1. Amino acid sequence alignment prepared with Clustal Omega. Red bars highlight the residues acting as iron ligands in the ferroxidase site, yellow bars the main residues located at the inner edge of the C3 channels and green bars those at the inner edge of the C4 channels. The selected ferritins represents structurally characterized examples of proteins from divergent branches of the ferritin phylogenetic tree (1).

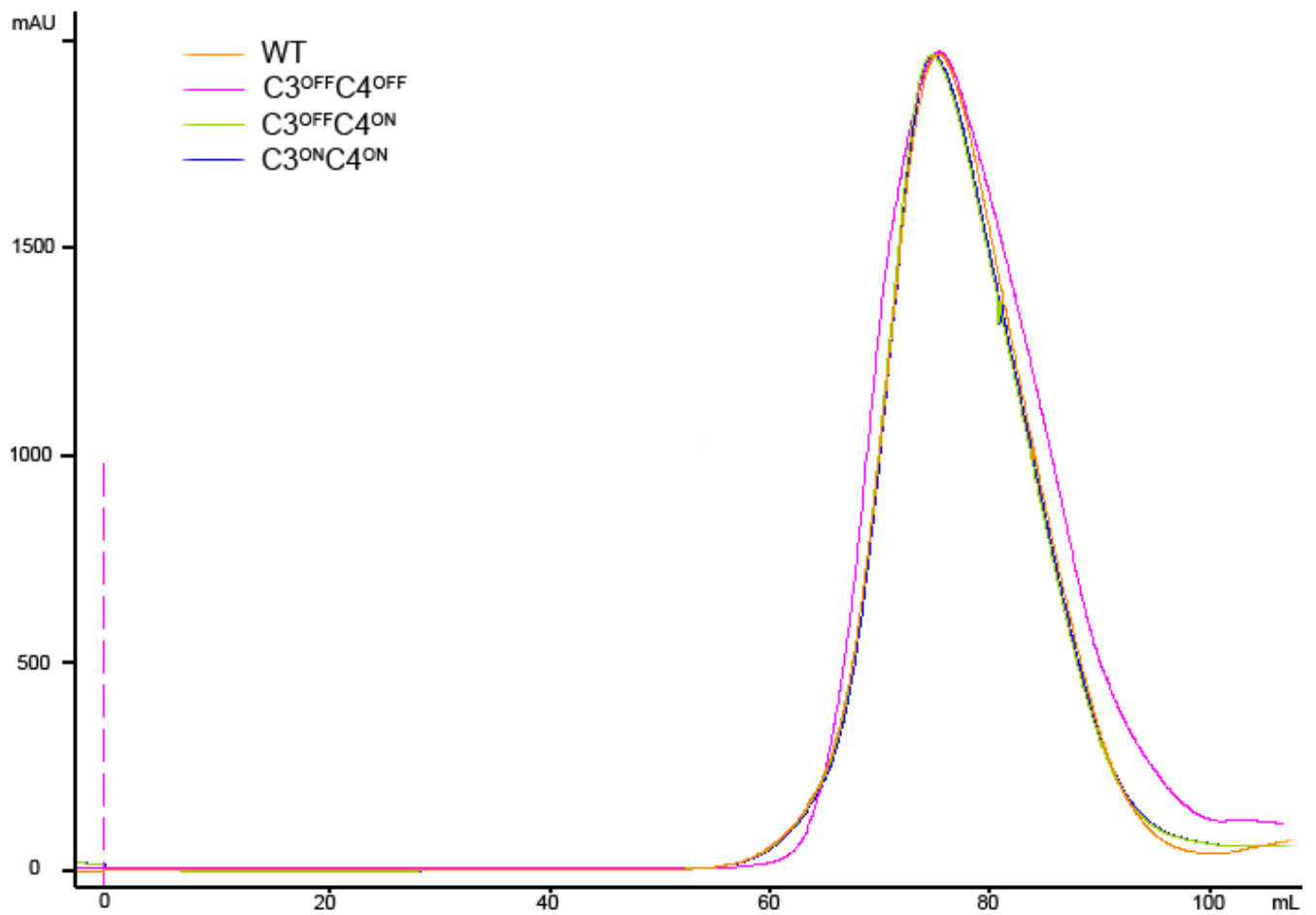


Figure S2. Elution profiles of the described ferritin variants in gel filtration chromatography obtained using a Superdex 200 16/60 column

- 1 A. Marchetti, M.S. Parker, L.P. Moccia, E.O. Lin, A.L. Arrieta, F. Ribalet, M.E. Murphy, M.T. Maldonado and E.V. Armbrust, *Nature*, 2009, **457**, 467.