Science Signaling
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Supplementary Materials for

The L-type amino acid transporter LAT1 inhibits osteoclastogenesis and maintains bone homeostasis through the mTORC1 pathway

Kakeru Ozaki, Takanori Yamada, Tetsuhiro Horie, Atsushi Ishizaki, Manami Hiraiwa, Takashi Iezaki, Gyujin Park, Kazuya Fukasawa, Hikari Kamada, Kazuya Tokumura, Mei Motono, Katsuyuki Kaneda, Kazuma Ogawa, Hiroki Ochi, Shingo Sato, Yasuhiro Kobayashi, Yun-Bo Shi, Peter M. Taylor, Eiichi Hinoi*

*Corresponding author. Email: hinoi@p.kanazawa-u.ac.jp

Published 9 July 2019, *Sci. Signal.* **12**, eaaw3921 (2019)
DOI: 10.1126/scisignal.aaw3921

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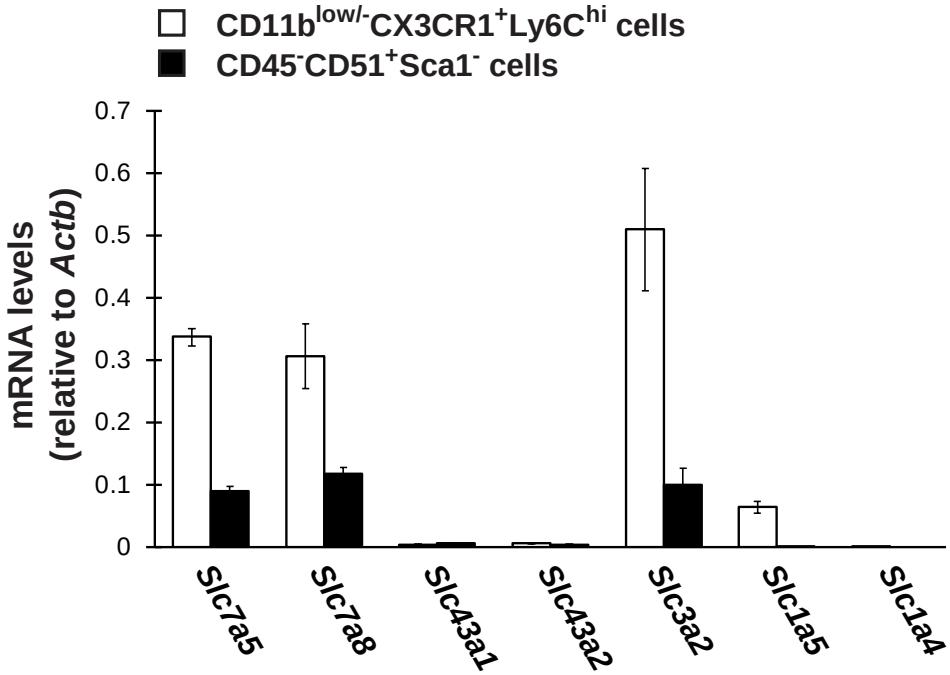

Fig. S1. Expression of genes encoding amino acid transporters in preosteoclasts and osteoblasts. $CD11b^{low/-}CX3CR1^{+}Ly6C^{hi}$ cells (preosteoclasts) and $CD45^{-}CD51^{+}Sca1^{-}$ cells (osteoblasts) were isolated by flow cytometry, and subsequently the expression of transcripts for amino acid transporters were quantified relative to a reference RNA (*Actb*). $n = 5$ mice.

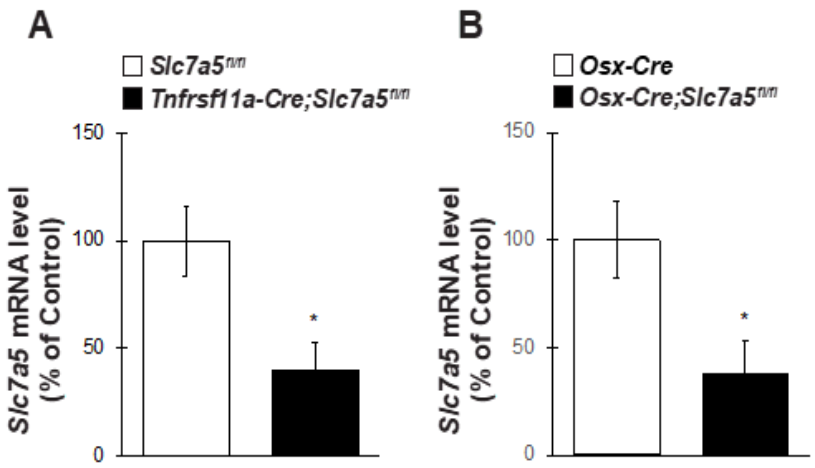

Fig. S2. Expression of *Slc7a5* mRNA in mutant mice. Quantitative data for *Slc7a5* expression in (**A**) Fig. 2B and (**B**) Fig. 3B.

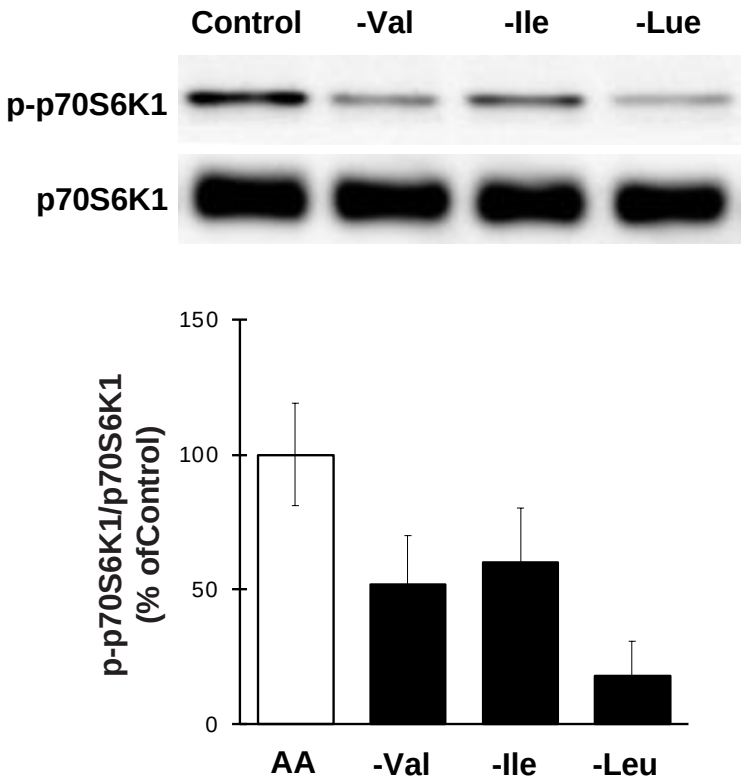

Fig. S3. Phosphorylation of p70S6K1 by EAA deprivation in osteoclasts. BMMs derived from *Slc7a5*$^{fl/fl}$ mice were retrovirally infected with Cre recombinase and subsequently stimulated with RANKL in the absence of Val, Ile, or Leu, followed by determination of p70S6K1 phosphorylation. n = 4 cell cultures. Data were analyzed by the one-way ANOVA with Bonferroni/Dunnett post hoc test.

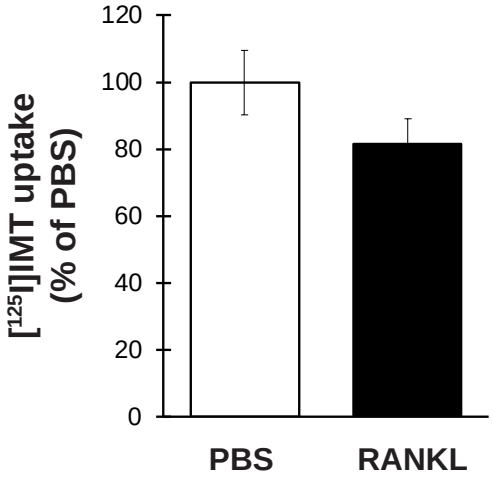

Fig. S4. Effect of RANKL on [^{125}I]IMT incorporation in osteoclasts. Primary osteoclasts from WT mice were incubated with [^{125}I]IMT at 37 °C for 30 min in HBSS buffer in the presence of RANKL. n = 4 cell cultures from different mice. Data were analyzed by the two-tailed Students' t-test.

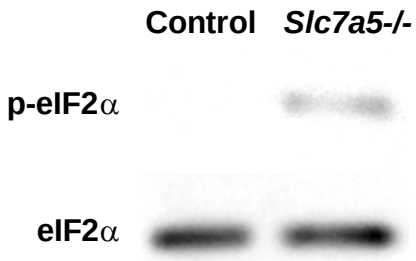

Fig. S5. Phosphorylation of eIF2α in *Slc7a5*-deficient cells. BMMs derived from *Slc7a5*$^{fl/fl}$ mice were retrovirally infected with Cre recombinase, followed by determination of eIF2α phosphorylation. *n* = 4 mice per genotype.

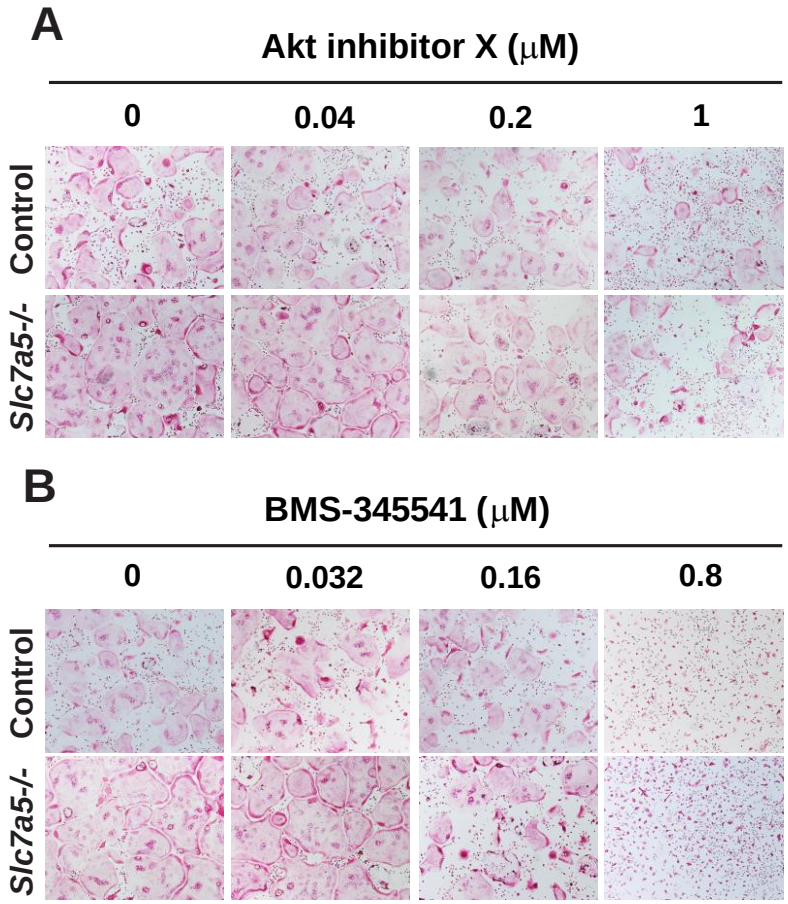

Fig. S6. Effects of Akt and NF-κB inhibitors in *Slc7a5*-deficient cells. BMMs from *Slc7a5*$^{fl/fl}$ mice were retrovirally infected with Cre recombinase, and subsequently stimulated with different concentrations of (**A**) Akt inhibitor X or (**B**) IKK inhibitor (BMS-345541) in the presence of RANKL, followed by TRAP staining. n = 4 mice per genotype.

Table S1. List of primers used for real-time PCR.

Genes	Upstream (5'-3')	Downstream (5'-3')
Ctsk	GAAGAAGACTCACCAGAAGCAG	TCCAGGTTATGGGCAGAGATT
Dcstamp	GACCTTGGGCACCAGTATTT	CAAAGCAACAGACTCCCAAA
Mmp9	CTGGACAGCCAGACACTAAAG	CTCGCGGCAAGTCTTCAGAG
Nfatc1	CCCGTTGCTTCCAGAAAATA	CCCGTTGCTTCCAGAAAATA
Slc7a5	CTGGTCTTCGCCACCTACTT	GCCTTTACGCTGTAGCAGTTC
Slc7a8	ACGTTTGGTGGAGTCAATGG	CAGGGCTGGGATTGGAGTG
Slc43a1	CTTCCGGGCTTCACCTATCTG	CCCAATTCCAAATCGCATCCAC
Slc43a2	TGCACCGCTGTGTTGGAAA	CCGTGCTGTTAGTGACATTCTC
Slc3a2	CACCGGCTTATCCAAGGAGG	GATGGCTCTTCAGACCAGCTA
Slc1a5	TGGAGGGAATGAACATCCTGG	GTTGAAGAAACGAATGAGCAGC
Slc1a4	GGCATCGCTGTTGCTTACTTC	CGAGGAAAGAGTCCACTGTCT