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CRISPR/Cas9 mediated ELANE knockout enables neutrophilic maturation of primary hematopoietic stem and progenitor cells and induced pluripotent stem cells of severe congenital neutropenia patients

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Contributions: M.N. and J.S. made initial observations; M.N. designed sgRNA and performed CRISPR/Cas9-mediated ELANE knockout in iPSCs and primary HSPCs; M.R. and D.A. performed CRISPR/Cas9-mediated ELANE knockout in primary HSPCs; B.D. generated, characterized, cultured and differentiated iPSCs; P.M., M.R. and D.A. conducted liquid culture differentiation and CFU assays for primary CD34+ cells; M.R., M.N. and D.A. evaluated in vitro neutrophil functions; N.A. and B.B. evaluated in vivo neutrophil functions; V.M. and B.F. generated HL60 cell lines with mutated ELANE and conducted siRNA experiments with these cells; Y.X. performed WBs; J.B, I.K., B.S., K.H. performed EM of neutrophils; R.B. assisted with the iPSCs culture and qRT-PCR; I.S. and Ka.Hae. helped with Sanger sequencing and qRT-PCR; C.Z. and K.W. provided patient material; N.A. and B.B. performed in vivo analysis; M.K. and D.C.D. assisted with the interpretation of data and provided insightful comments; J.S. and K.W. supervised and supported the study and wrote the manuscript (with the assistance of M.N., V.M, and D.C.D).