Catchup: a mouse model for imaging-based tracking and modulation of neutrophil granulocytes.

Hasenberg A, Hasenberg M, Männ L, Neumann F, Borkenstein L, Stecher M, Kraus A, Engel DR, Klingberg A, Seddigh P, Abdullah Z, Klebow S, Engelmann S, Reinhold A, Brandau S, Seeling M, Waisman A, Schraven B, Göthert JR, Nimmerjahn F, Gunzer M (2015) Catchup: a mouse model for imaging-based tracking and modulation of neutrophil granulocytes. *Nat Methods* 12(5), 445-452. PubMed

ILRS Authors

 Pegah Seddigh

Projects

 Identifying the pulmonary phagocytic network of mice infected with *Aspergillus fumigatus*
Details

Abstract

Neutrophil granulocyte biology is a central issue of immunological research, but the lack of animal models that allow for neutrophil-selective genetic manipulation has delayed progress. By modulating the neutrophil-specific locus Ly6G with a knock-in allele expressing Cre recombinase and the fluorescent protein tdTomato, we generated a mouse model termed Catchup that exhibits strong neutrophil specificity. Transgene activity was found only in very few eosinophils and basophils and was undetectable in bone marrow precursors, including granulomonocytic progenitors (GMPs). Cre-mediated reporter-gene activation allowed for intravital two-photon microscopy of neutrophils without adoptive transfer. Homozygous animals were Ly6G deficient but showed normal leukocyte cellularity in all measured organs. Ly6G-deficient neutrophils were functionally normal in vitro and in multiple models of sterile or infectious inflammation in vivo. However, Cre-mediated deletion of FcγRIV in neutrophils reduced the cells' recruitment to immune-complex-mediated peritonitis, suggesting a cell-intrinsic role for activating Fc receptors in neutrophil trafficking.

Identifier