inotiv
analyze. answer. advance.

Genetically engineered models (GEMS)

Rag2 knockout rat Sprague Dawley

MODEL	Rag2 knockout rat | Sprague Dawley
STRAIN	HsdSage: SD-*Rag2*^{em1Sage}
LOCATION	U.S.
AVAILABILITY	Live colony

CHARACTERISTICS/HUSBANDRY

- 2 bp deletion within Exon 3 on chromosome 3
- Homozygous Rag2 knockout rats display loss of RAG2 protein via Western blot
- Homozygous Rag2 knockout rats show loss of B and T cells by FACS analysis

ZYGOSITY GENOTYPE

- Homozygous

RESEARCH USE

- Xenograft
- Cancer metastasis
- Vaccine development
- Inflammation/Autoimmune disorders
- Thrombosis/Cardiac fibrosis
- Vascular defects
- Hematopoieses
- Infectious disease

ORIGIN

The Rag2 (Sprague Dawley) knockout rat model was originally created at SAGE Labs, Inc. in St. Louis, MO. The animal inventory was acquired by Envigo in 2019 and then by Inotiv in 2021. The line continues to be maintained through the original SAGE Labs animal inventory and is distributed out of the Boyertown, PA facility.

DESCRIPTION

Rag2 knockout rats completely lack B and T cells, making them ideal immuno-compromised hosts for xenograft studies. In addition, the larger size of the rat makes performing sophisticated xenograft techniques and surgeries much simpler as compared to similar studies in a mouse.

Mature B and T cells are critical components for an adaptive immune system. Rats deficient in the Rag2 protein produce no mature B or T cells. This non-leaky model for severe combined immune deficiency is useful for vaccine development, autoimmune and infectious diseases.

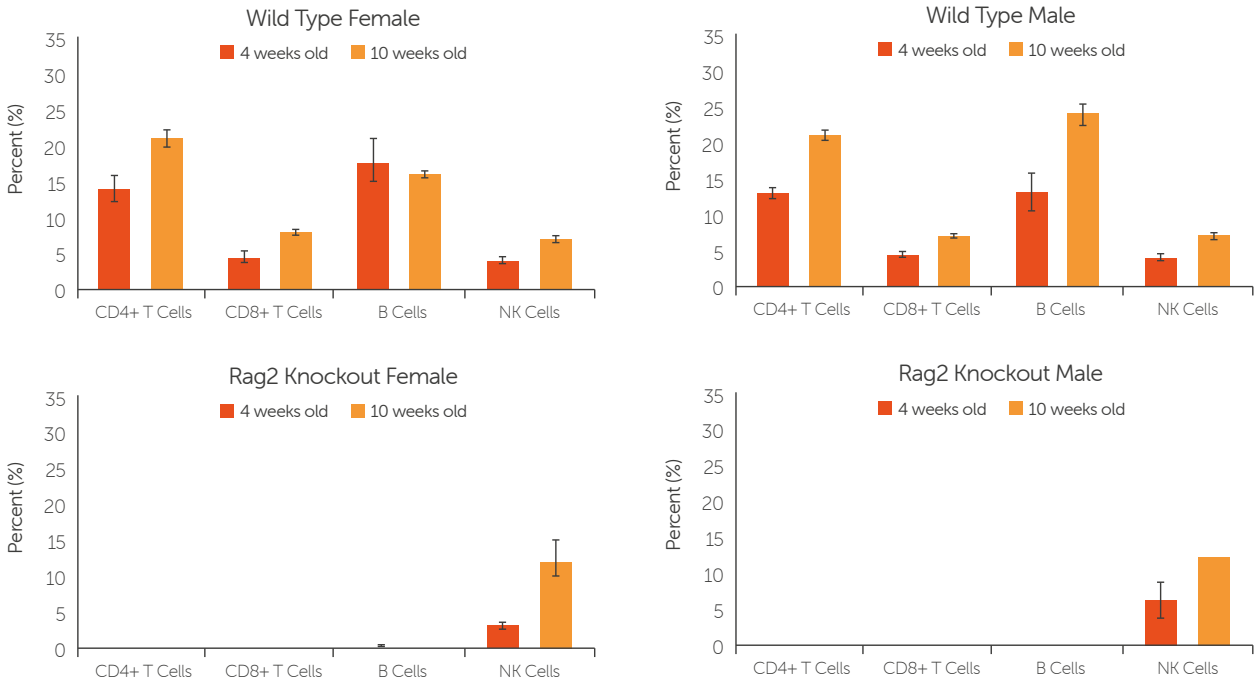

Figure 1: *Flow cytometric analysis of T cell subsets (CD4 and CD8), B cells and NK cells in blood samples from wild type and Rag2 knockout rats. The top panels represent wild type female and male rats. The lower panels represent samples from female and male Rag2 knockout rats. Blood samples were collected from 4- and 10-week-old rats.*

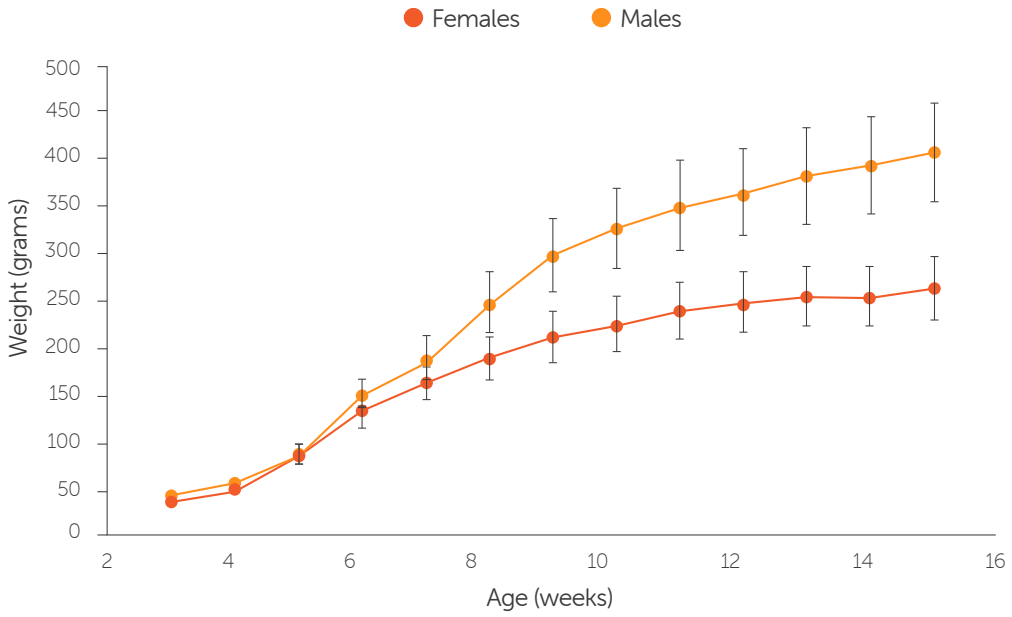

Figure 2: *A graph showing the correlation between the age and weight of Rag2 knockout rats.*