Materials and Methods: A mutation within *Fryl* gene was introduced in KTPU8 ES cells using pU-21T gene trap vector by electroporation. Germline transmitted *Fryl* mutant mouse line was established from chimeric mice which was derived by micro injection of the cells into C57BL/6J blastocysts. *Fryl* expression was analyzed by X-gal staining and immunohistochemistry in the adult mouse tissues. The tissue samples from *Fryl*$^{-/-}$mice were H&E stained for histopathologic observations.

Results: Most of the *Fryl*$^{-/-}$mice were died soon after birth. Growth retardation with significant lower body weight was observed in the rare *Fryl*$^{-/-}$survivors. Some of the survivors died of nephropathy at various their ages. No apparent abnormal histopathologic legion was observed except for kidney. In the analysis of the gene expression in the adult mouse tissues, specific *Fryl* expressions in the glomeruli were demonstrated. In addition, *Fryl* expressions were detected in bronchioles of the lung, and vessels in various tissues, suggesting that the nephropathy may have relation with *Fryl* deficiency.

Conclusions: We have produced, for the first time, *Fryl* gene null mutant mouse. Most of the *Fryl*$^{-/-}$ mice showed neonatal lethality. The rare survived *Fryl*$^{-/-}$mice suffered from chronic nephropathy. Therefore, this mutant mouse could be used as a valuable model for studies on the *in vivo Fryl* functions in mice.

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Comparison of grading methods for collagen-induced arthritis in Rhbdf2$^{-/-}$ mice

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Introduction: Rheumatoid arthritis (RA) is an autoimmune disease that leads to chronic inflammation in the joints, destruction of the cartilage and erosion on the bone in the affected joint. One of the inactive homologues lacking essential catalytic residues of rhomboid intra membrane serine proteases is rhomboid family member 2 (*Rhbdf2*). This protein is known to help the maturation of tumor necrosis factor-alpha converting enzyme, and known to be inhibitory effects in the RA induction in mice.

Materials and Methods: In this study, collagen-induced arthritis (CIA) was induced in *Rhbdf2* mutant mouse using chicken collagen type II to see the effects of the null mutation in *Rhbdf2* gene. The clinical score of the lesions was graded according to the degree of swelling of the affected joints. We also analyzed the histology for the affected joints by x-ray, grip strength test and rota rod test as well as tradition grading method.

Results: The clinical scores measured by various methods clearly showed specific grades of CIA for each mouse groups. The scores were evaluated by comparing the histopathologic observation of the joints.

Conclusions: These results suggest that x-ray, grip strength test and rota rod test are all used for scoring the clinical scores in CIA induced in mice

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Proliferation of K562 human leukemia cells was synergistically inhibited by cytosine deaminase and interferon-β transduced into human neural stem cells

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Introduction: Gene-directed enzyme/prodrug therapies have been found to be more advantageous compared to conventional cancer treatment method. One of these, a cytosine deaminase(CD)/5-fluorocytosine (5-FC) system, is known to induce apoptosis of cancer cells by converting 5-FC, a prodrug, to its metabolically active form,5-fluorouracil. In this study, human neural stem cells (hNSCs) derived enzyme/prodrug therapy was used to treat leukemia. The parental hNSCs, HB1.F3, were engineered to express E. coli CD and/or human interferon-β.

Materials and Methods: Athymic Nude female mice (5 weeks