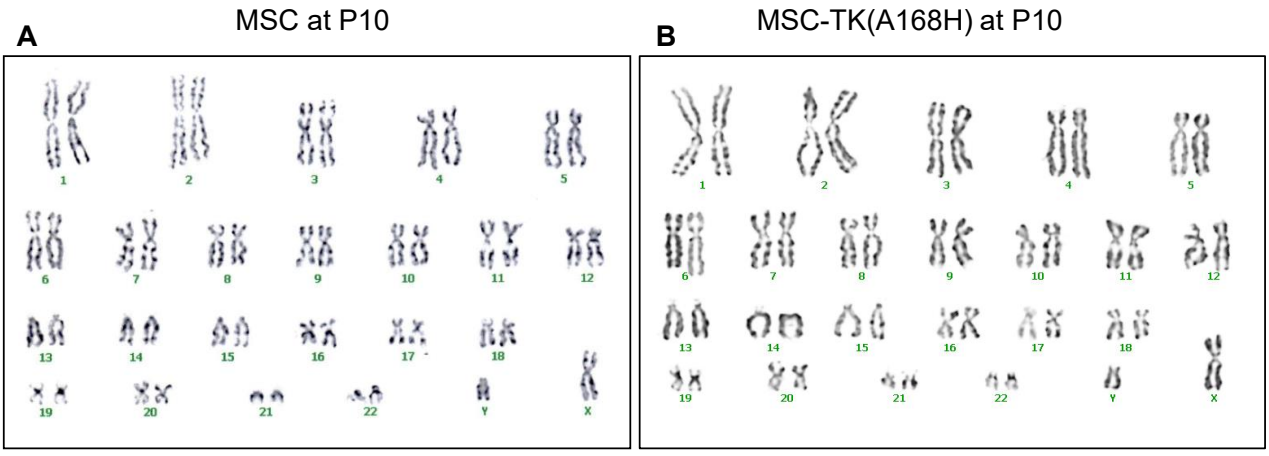
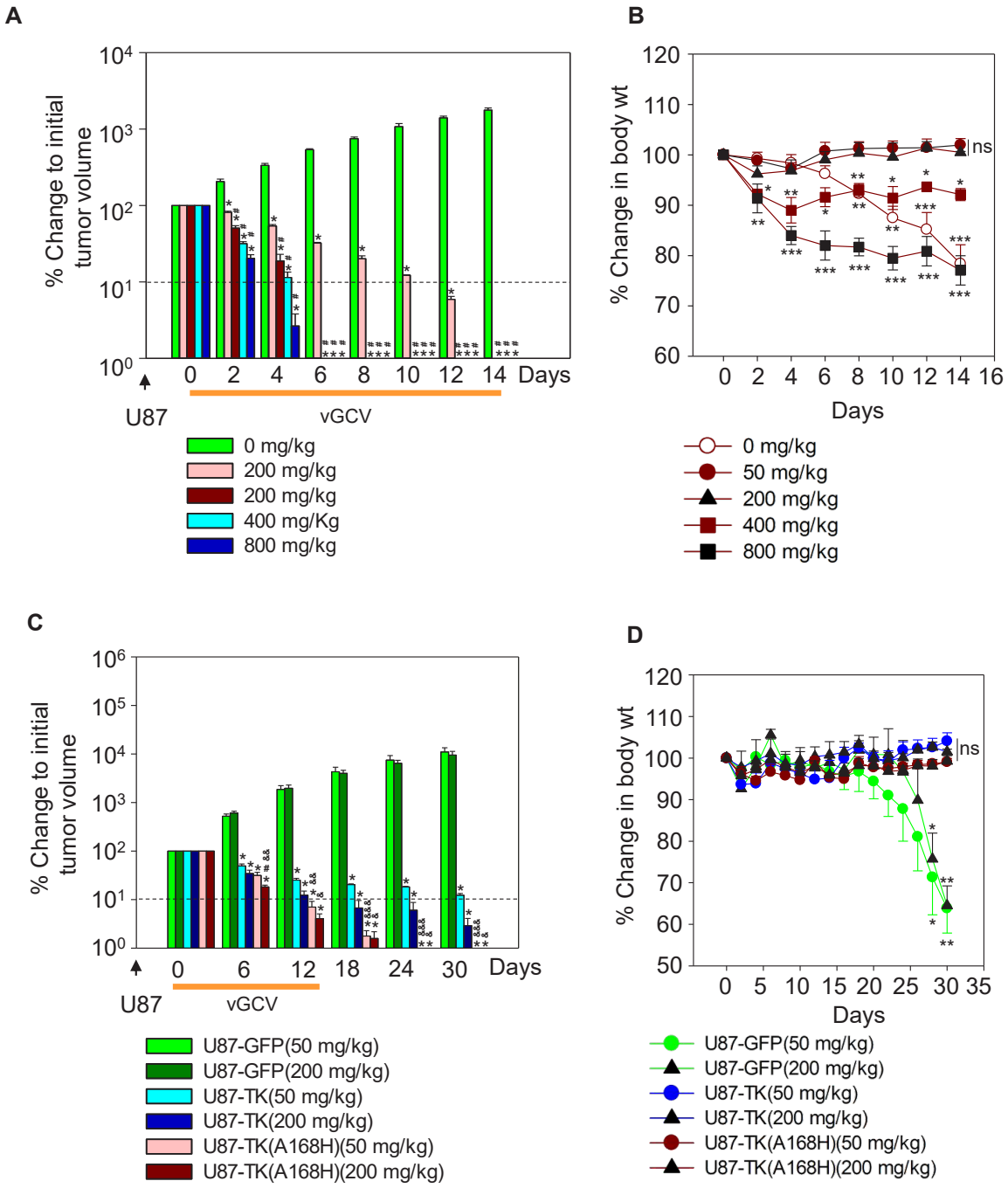


Supplementary Fig. S1. Stability of lentivirus transduced MSC-TK(A168H) during long term culture. Karyotyping analysis of naïve MSCs (A) and MSC-TK(A168H) cells (B) at passage 10 indicates normal karyotypes.



Supplementary Fig. S2. Modeling SAE with U87-derived cells and suppressing the uncontrolled cell growth *in vivo*. (A) U87-TK(A168H) tumor bearing mouse were daily administered by 50, 200, 400, and 800 mg/kg vGCV. Decreases in tumor volume indicating the clearance of tumors at various rates by administration of indicated doses of vGCV for 14 days (indicated by orange line). Data are presented as mean ± SEM from 4 animals per group ($*P < 0.001$ compared to 0 mg/kg group, $^{\#}P < 0.001$ compared to 50 mg/kg group; one-way ANOVA test). (B) Body weight is presented after subtracting tumor mass, indicating toxicity of vGCV at doses higher than 200 mg/kg. Data are presented mean ± SEM from 4 animals per group ($*P < 0.05$, $**P < 0.01$, $***P < 0.001$ compared to initial body weight; one-way ANOVA test). (C) Cytotoxic effect of TK and TK(A168H) *in vivo* in combination with daily administration of 50 and 200 mg/kg vGCV for 14 days (indicated by orange line). Note that tumors with U87-GFP without TK continuously grew in the presence of vGCV. Data are presented mean ± SEM from 3-6 animals per group ($*P < 0.001$ compared to U87-GFP group with same dose of vGCV, $^{\#}P < 0.05$ compared to U87-TK(A168H) (50 mg/kg) group, $^{\&}P < 0.05$, $^{\&\&}P < 0.01$, $^{\&\&\&}P < 0.001$ compared to U87-TK group with same dose of vGCV; one-way ANOVA test). (D) Body weight is presented after subtracting tumor mass, indicating the 200 mg/kg are tolerable. Weight loss was severe in the U87-GFP without TK due to heavy tumor burden. Data are presented mean ± SEM from 3-6 animals per group ($*P < 0.05$, $**P < 0.01$ compared to initial body weight; Student *t*-test). ns, not significant.