A Bile Duct — *YY1* gene expression vs *MGP* gene expression — r=0.611, p≤0.0001

B Bladder — *YY1* gene expression vs *MGP* gene expression — r=-0.099, p=0.049

C Breast — *YY1* gene expression vs *MGP* gene expression — R=0.086, p=0.003

D Colorectal — *YY1* gene expression vs *MGP* gene expression — r=0.518, p≤0.0001

E Esophageal — *YY1* gene expression vs *MGP* gene expression — r=-0.451, p=0.063

F Kidney — *YY1* gene expression vs *MGP* gene expression — R=0.455, p≤0.0001

G Liver — *YY1* gene expression vs *MGP* gene expression — R=0.150, p=0.003

H Prostate — *YY1* gene expression vs *MGP* gene expression — R=0.245, p≤0.0001

I Thyroid — *YY1* gene expression vs *MGP* gene expression — r=0.137, p=0.001

J Bladder — *GATA1* gene expression vs *MGP* gene expression — r=0.447, p≤0.0001

K Breast — *GATA1* gene expression vs *MGP* gene expression — R=0.088, p=0.003

L Colorectal — *GATA1* gene expression vs *MGP* gene expression — r=0.373, p≤0.0001

M Esophageal — *GATA1* gene expression vs *MGP* gene expression — r=0.457, p≤0.0001

N Head and Neck — *GATA1* gene expression vs *MGP* gene expression — r=0.426, p≤0.0001

O Kidney — *GATA1* gene expression vs *MGP* gene expression — R=0.151, p≤0.0001

P Liver — *GATA1* gene expression vs *MGP* gene expression — R=0.135, p=0.008

Q Lung — *GATA1* gene expression vs *MGP* gene expression — r=0.501, p≤0.0001

R Prostate — *GATA1* gene expression vs *MGP* gene expression — R=0.324, p≤0.0001

S Thyroid — *GATA1* gene expression vs *MGP* gene expression — r=0.099, p=0.019

T Bile Duct — *C/EBPα* gene expression vs *MGP* gene expression — r=-0.368, r=0.013

U Bladder — *C/EBPα* gene expression vs *MGP* gene expression — r=-0.184, p=0.0003

V Breast — *C/EBPα* gene expression vs *MGP* gene expression — R=0.072, p=0.013

W Colorectal — *C/EBPα* gene expression vs *MGP* gene expression — r=0.271, p≤0.0001

X Esophageal — *C/EBPα* gene expression vs *MGP* gene expression — r=-0.254, p=0.002

Y Lung — *C/EBPα* gene expression vs *MGP* gene expression — r=0.223, p≤0.0001

Z Thyroid — *C/EBPα* gene expression vs *MGP* gene expression — r=0.214, p≤0.0001

A' Bile Duct — *RUNX2* gene expression vs *MGP* gene expression — r=0.674, p≤0.0001

B' Bladder — *RUNX2* gene expression vs *MGP* gene expression — r=0.266, p≤0.0001

C' Colorectal — *RUNX2* gene expression vs *MGP* gene expression — R=0.647, p≤0.0001

D' Esophageal — *RUNX2* gene expression vs *MGP* gene expression — R=0.189, p=0.022

E' Head and Neck — *RUNX2* gene expression vs *MGP* gene expression — r=0.413, p≤0.0001

F' Kidney — *RUNX2* gene expression vs *MGP* gene expression — R=0.433, p≤0.0001

G' Liver — *RUNX2* gene expression vs *MGP* gene expression — R=0.538, p≤0.0001

H' Prostate — *RUNX2* gene expression vs *MGP* gene expression — R=0.331, p≤0.0001

**I'** Thyroid — *RUNX2* gene expression vs *MGP* gene expression — R=0.195, p≤0.0001

Supplementary Figure S1. Correlation between expression of *MGP* and TFs in cancer. (A–I) *MGP* expression levels were negatively closely related to *YY1* in bladder cancer. (**J–S**) *MGP* expression was positively closely related with *GATA1* in bladder, breast, colorectal, esophageal, head and neck, kidney, liver, lung, prostate, and thyroid cancers. (**T–Z**) *MGP* expression was negatively closely related to *C/EBPα* in bile duct, bladder, and esophageal cancers, and positively closely related to *C/EBPα* in breast, colorectal, lung, and thyroid cancers. (**A′–I′**) *MGP* expression was positively closely related with *RUNX2* in bile duct, bladder, colorectal, esophageal, head and neck, kidney, liver, prostate, and thyroid cancers.
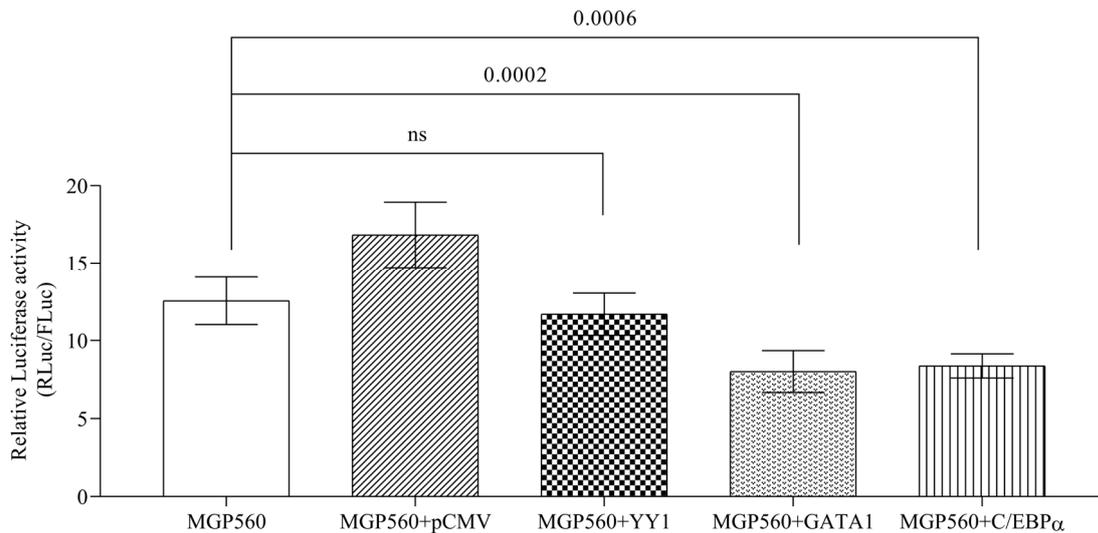
Supplementary Figure S2. Effect of YY1, GATA1, and C/EBPα transcription factors on *MGP* promoter activity. The *MGP* promoter fragment MGP560 was co-transfected with the YY1, GATA1, and C/EBPα expression vectors. Data are presented as mean ± SD of at least five independent experiments. Statistical significance was determined by a one-way ANOVA statistical test with Tukey's correction; *p*-values were considered significant when $p \leq 0.05$.
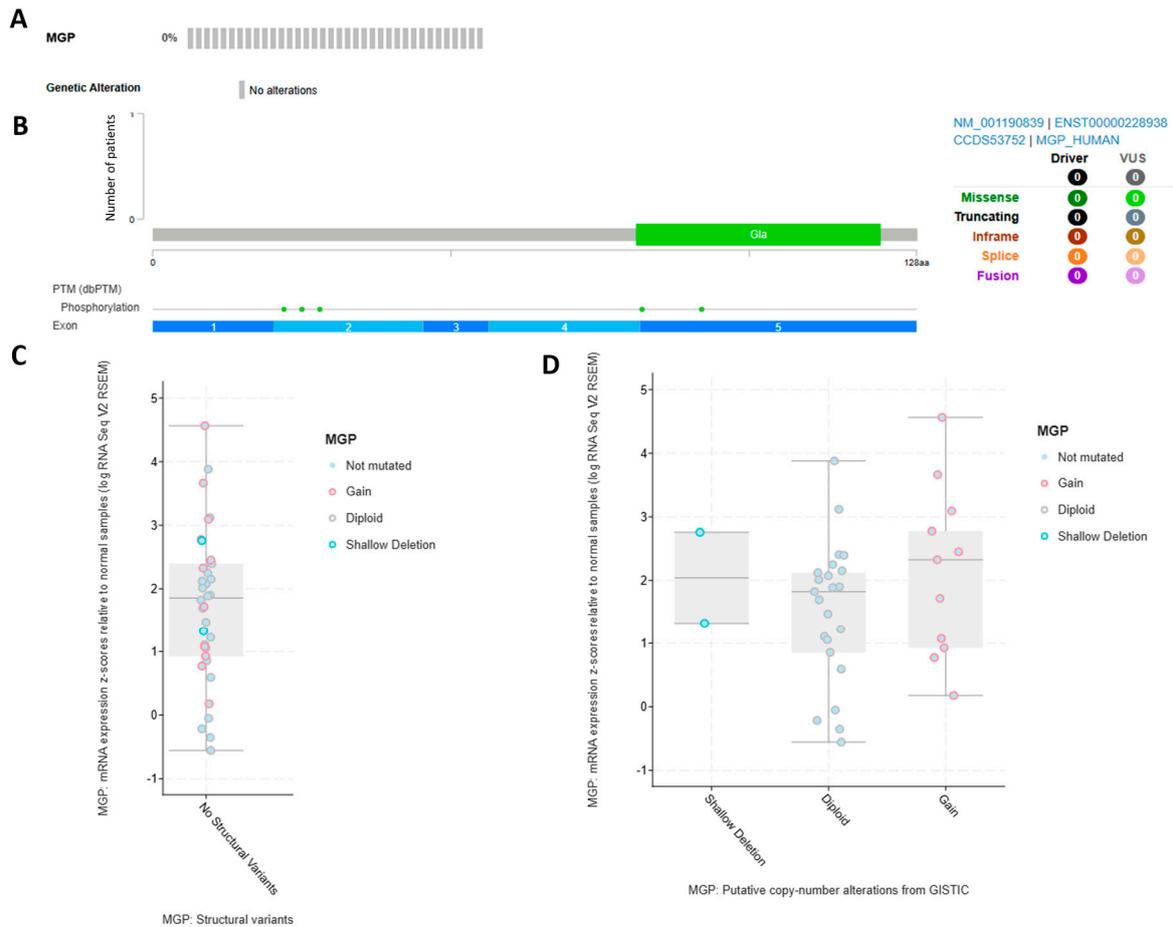
Supplementary Figure S3. The graphical representation and analysis of mutations and copy number alterations in the *MGP* gene for bile duct samples, using cBioPortal. (A) Oncoprint showing the overall genetic alterations. (B) Distribution of mutations and their effect on the protein, exonic regions, and topological structure. (C) Correlation between mutations and mRNA expression z-scores relative to normal samples. (D) Correlation between copy number alterations and mRNA expression z-scores relative to normal samples.
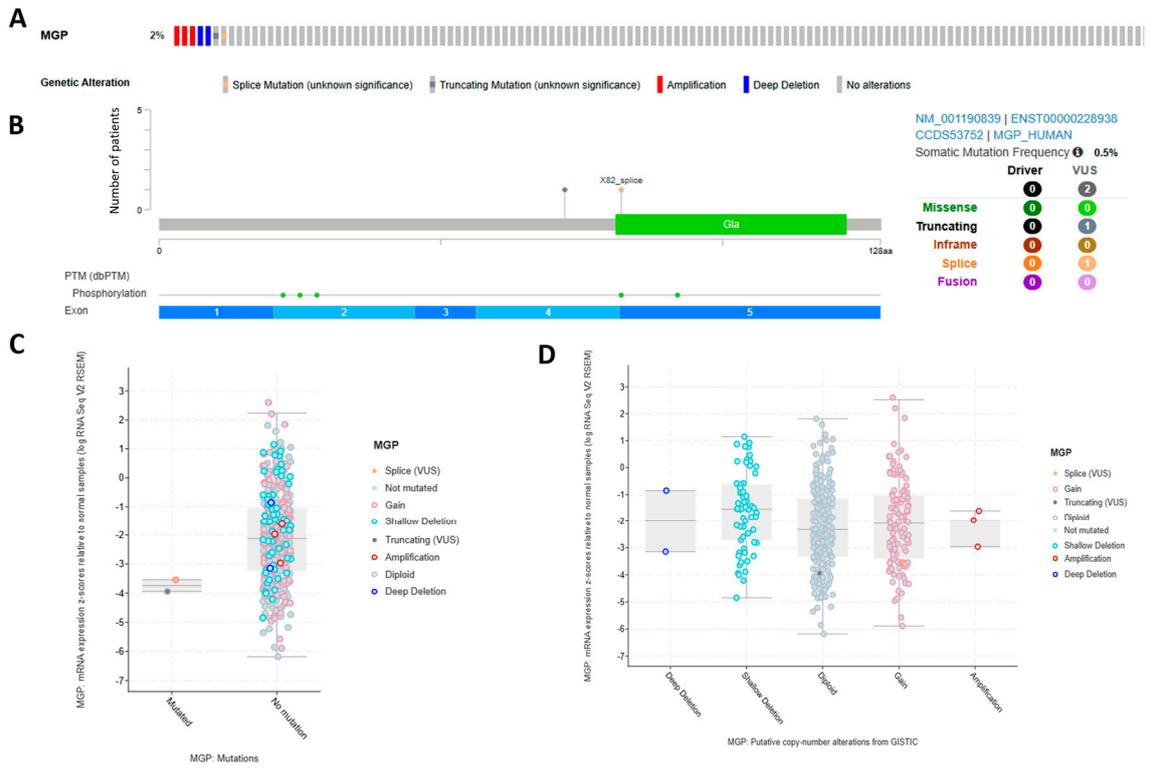
Supplementary Figure S4. Same analysis as Figure S3, but for bladder cancer samples.
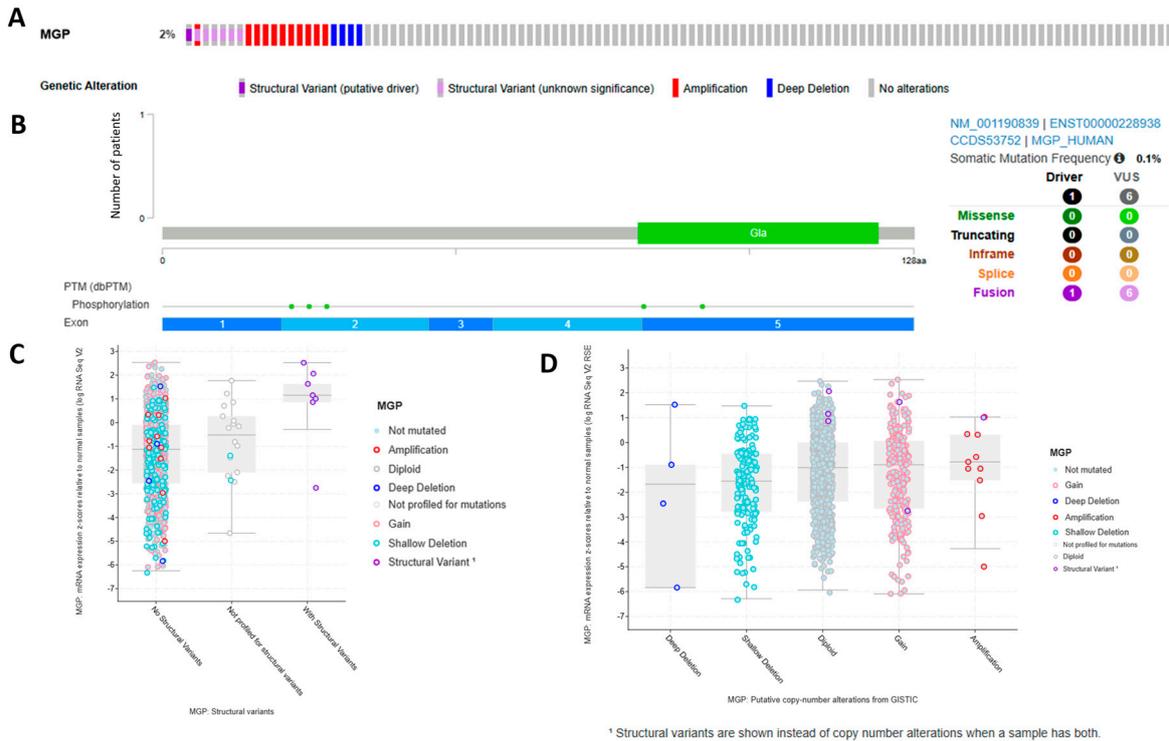
Supplementary Figure S5. Same analysis as Figure S3, but for breast cancer samples.
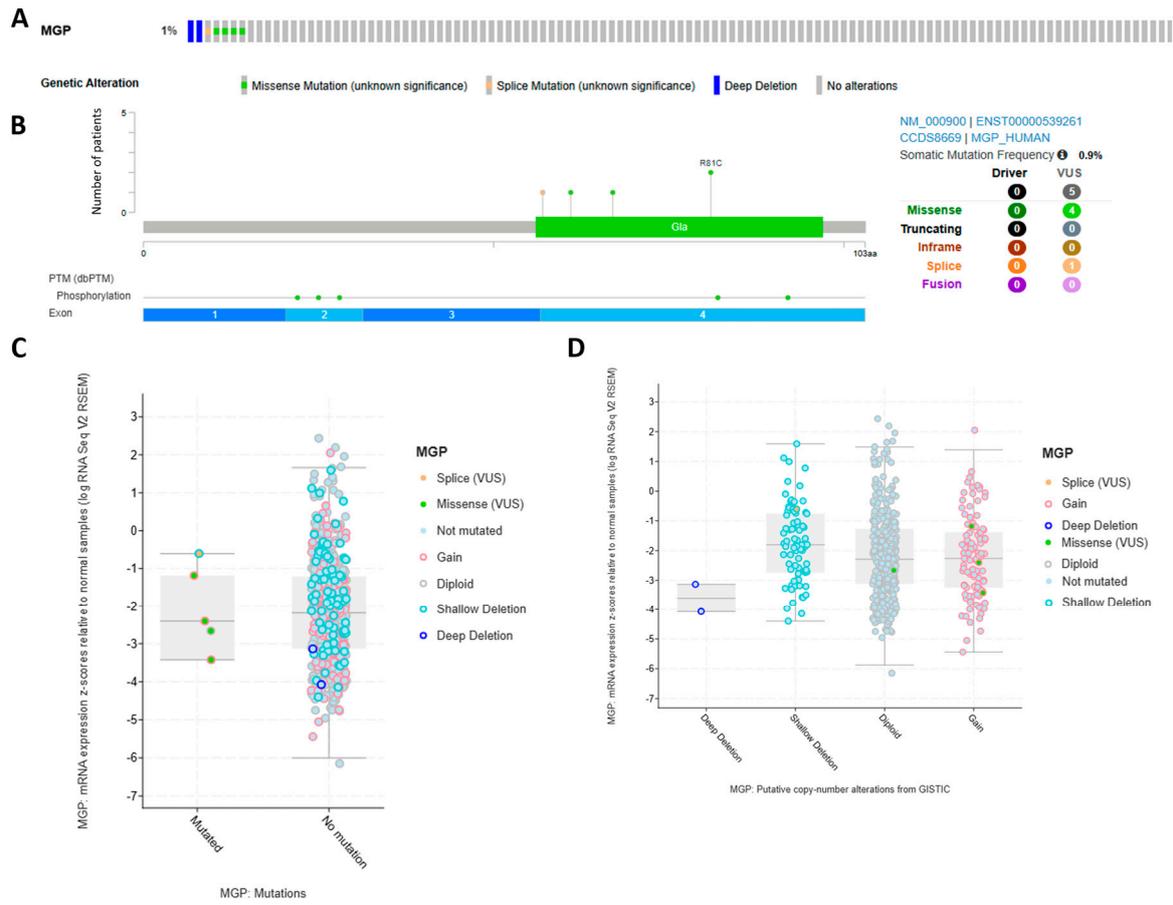
Supplementary Figure S6. Same analysis as Figure S3, but for colorectal cancer samples.
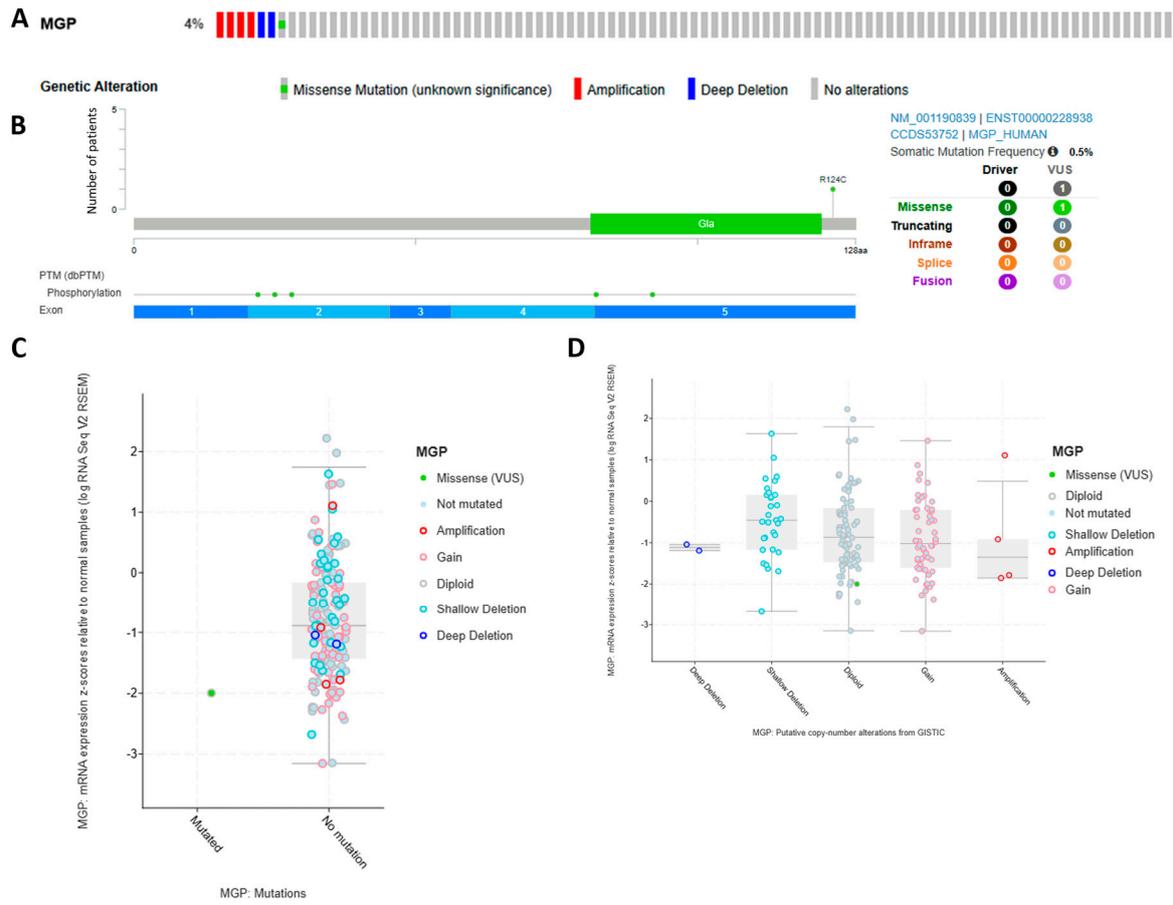
**Supplementary Figure S7.** Same analysis as Figure S3, but for esophageal cancer samples.
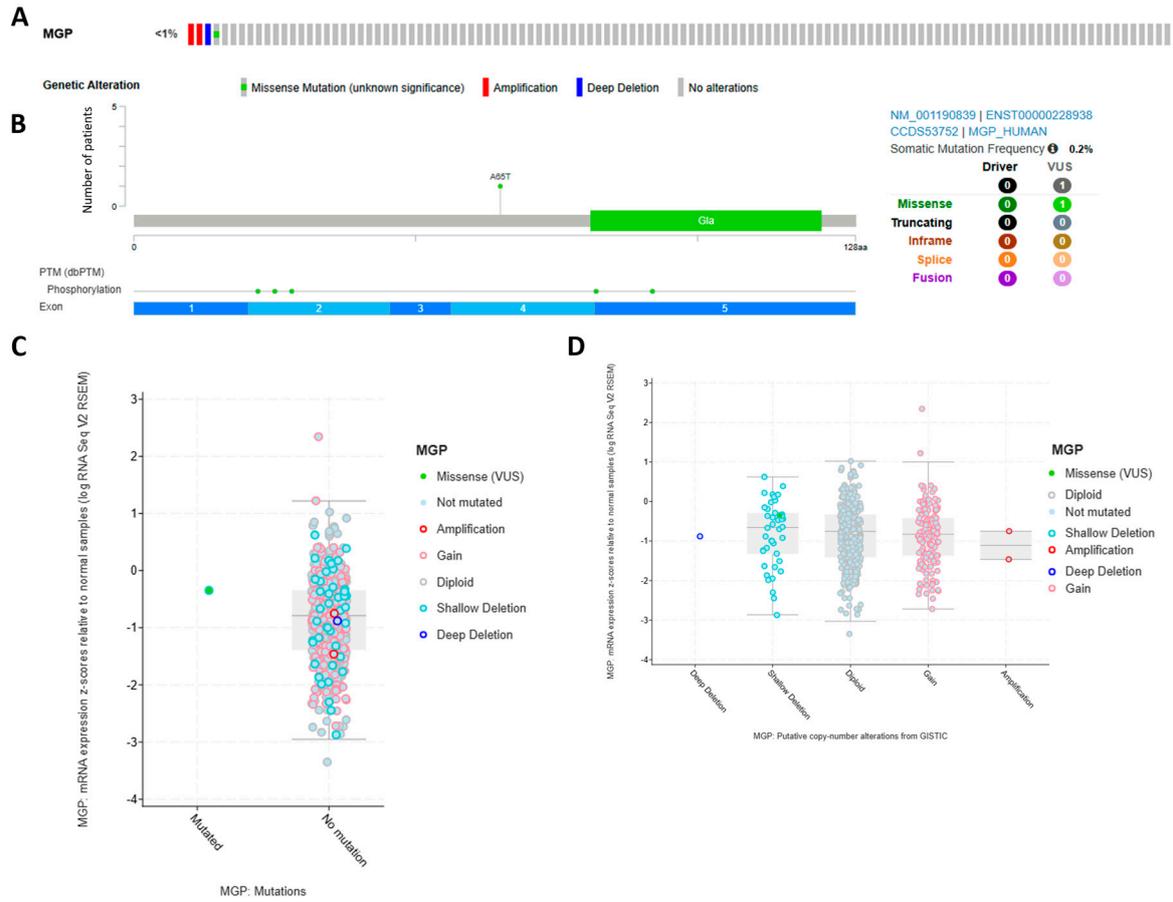
**Supplementary Figure S8.** Same analysis as Figure S3, but for head and neck cancer samples.
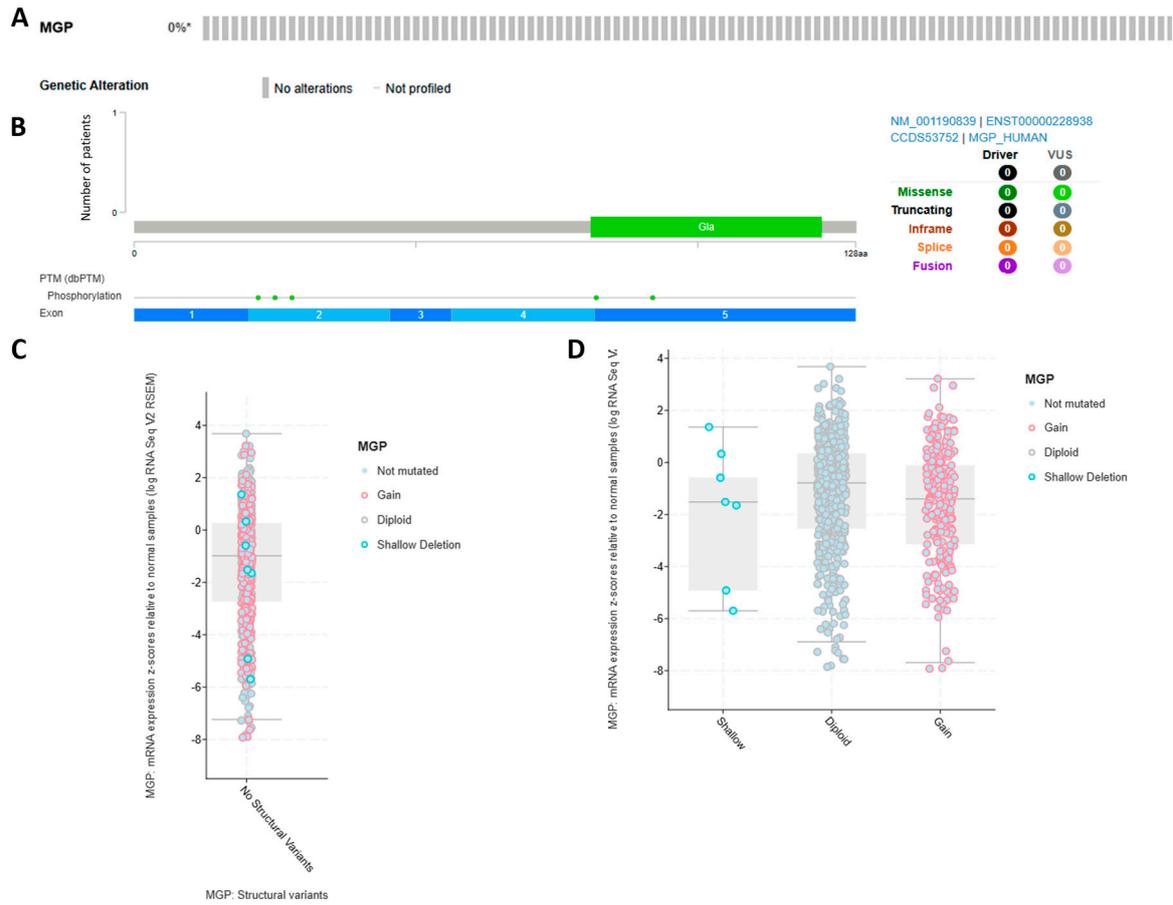
**Supplementary Figure S9.** Same analysis as Figure S3, but for kidney cancer samples.
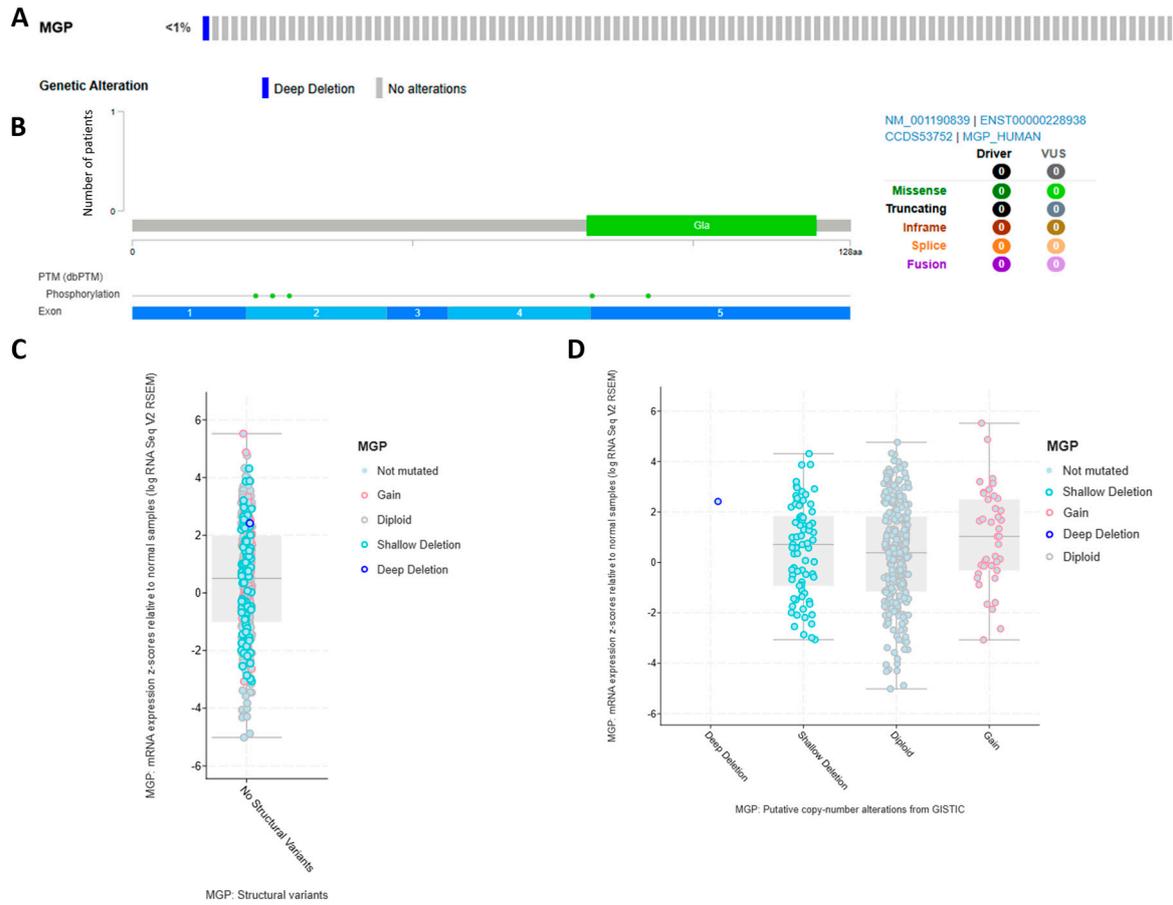
Supplementary Figure S10. Same analysis as Figure S3, but for liver cancer samples.
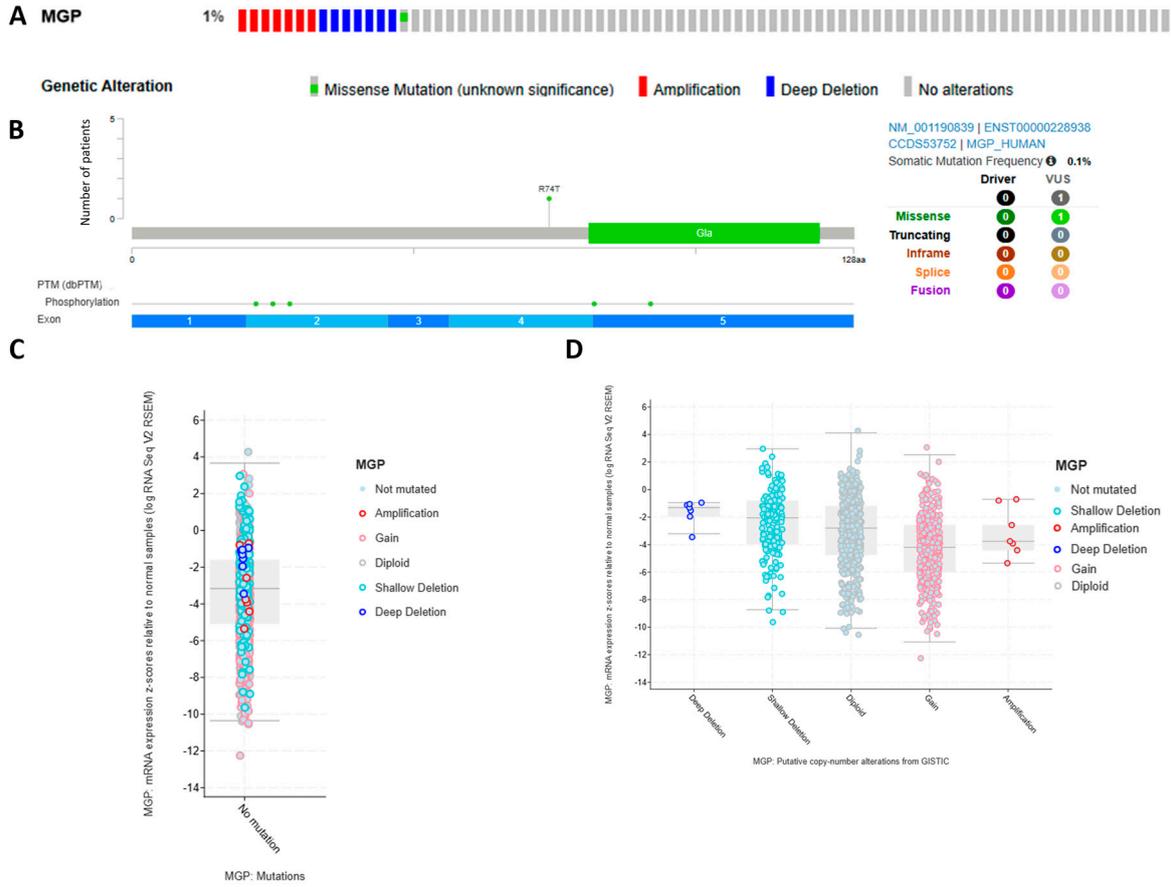
Supplementary Figure S11. Same analysis as Figure S3, but for lung cancer samples.
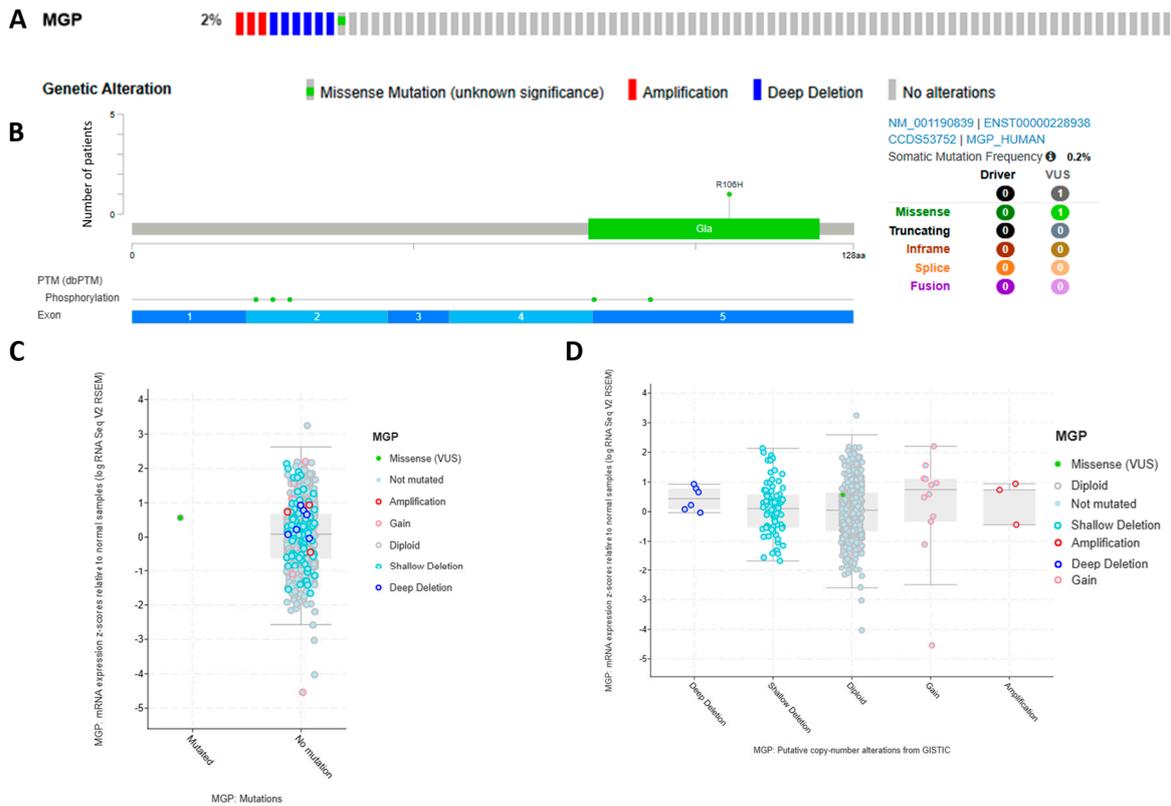
Supplementary Figure S12. Same analysis as Figure S3, but for prostate cancer samples.
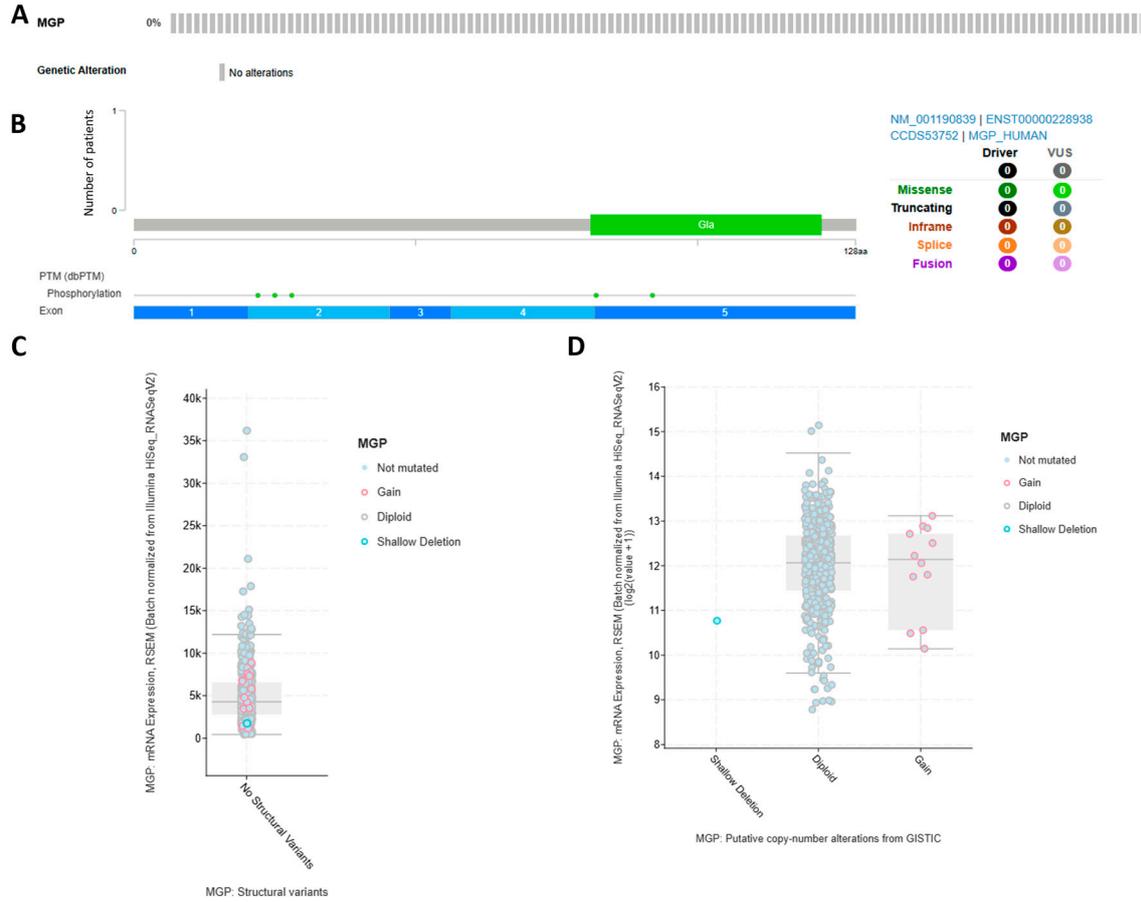
Supplementary Figure S13. Same analysis as Figure S3, but for thyroid cancer samples.