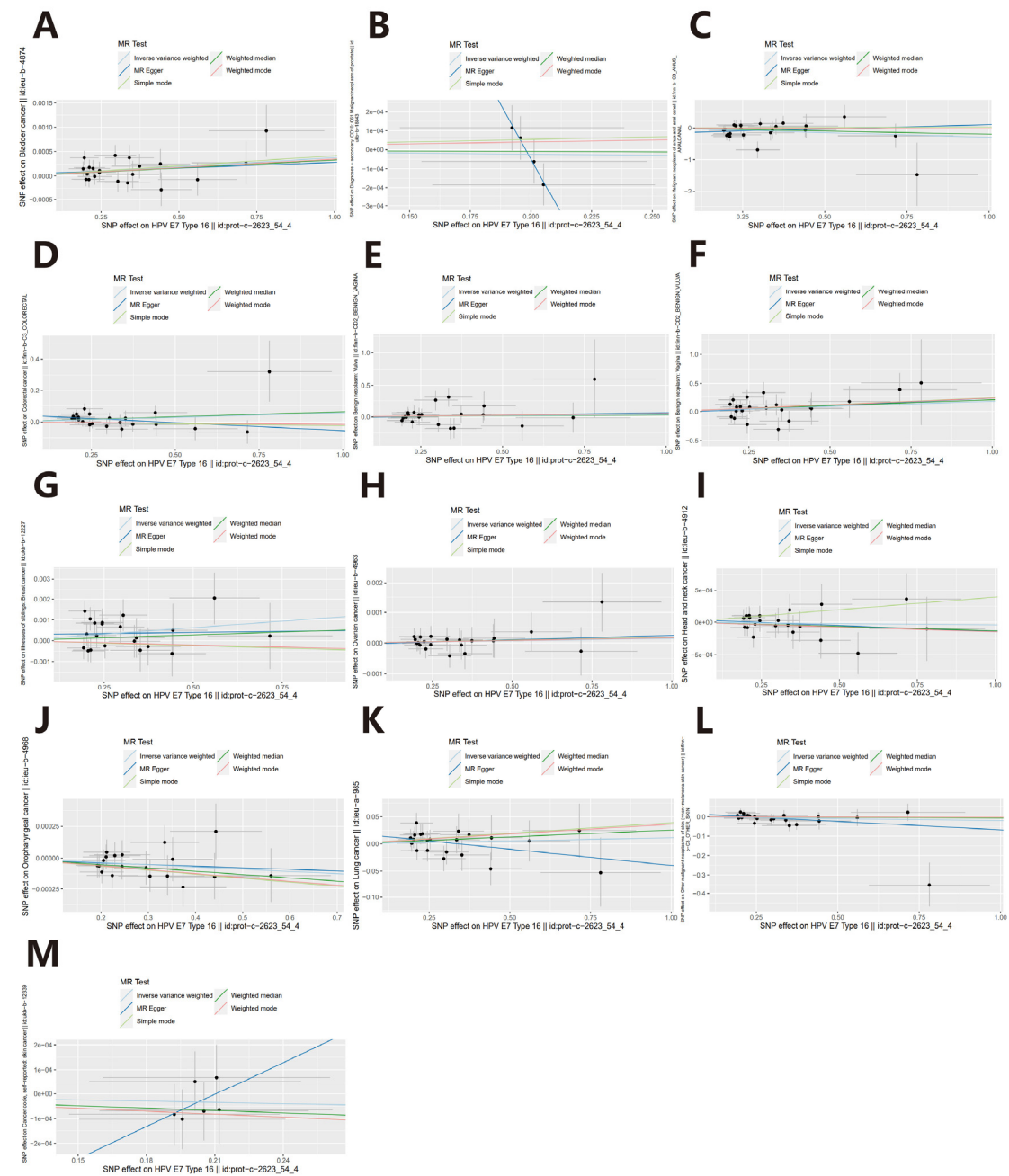
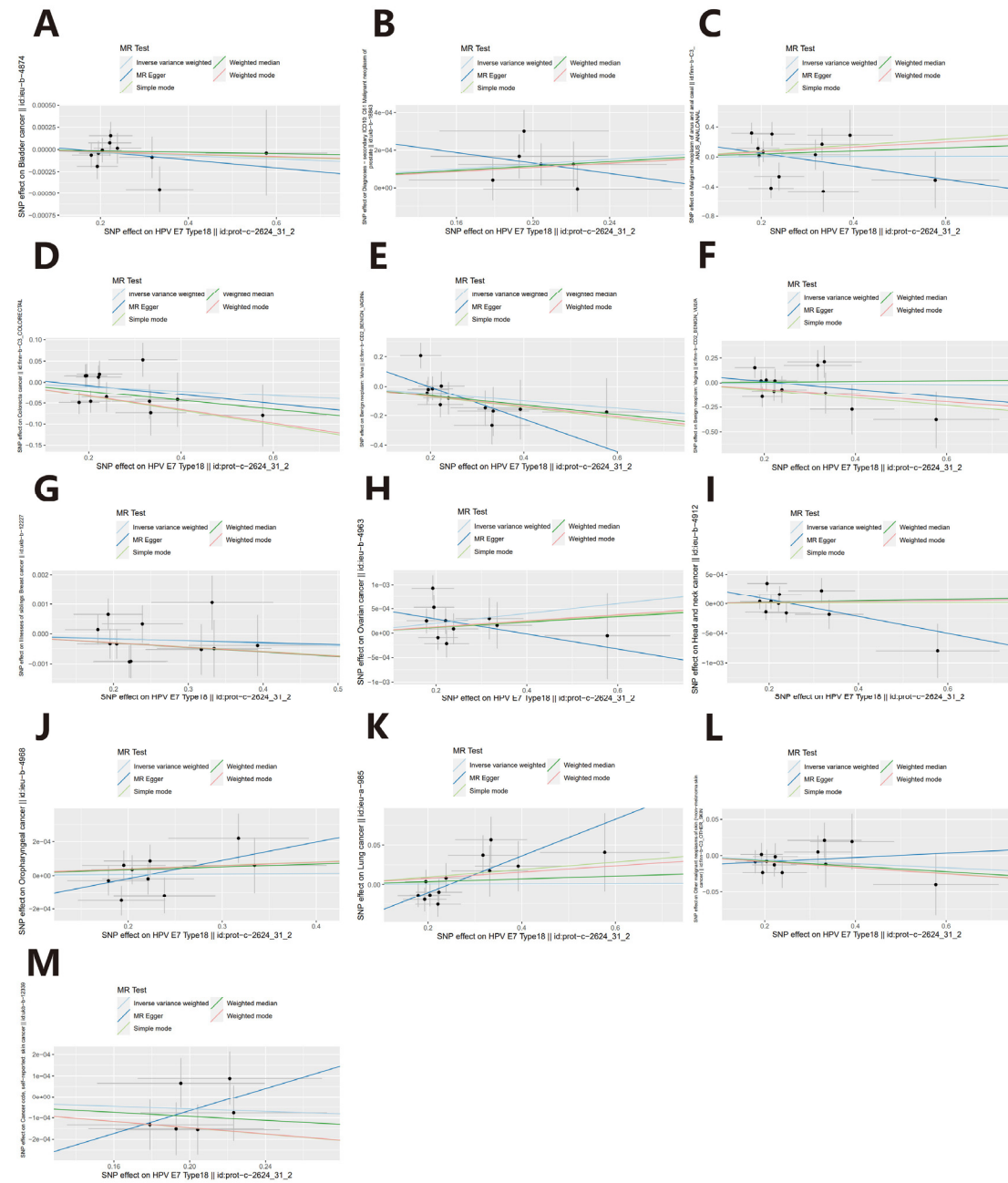


## Supplementary Figure S1



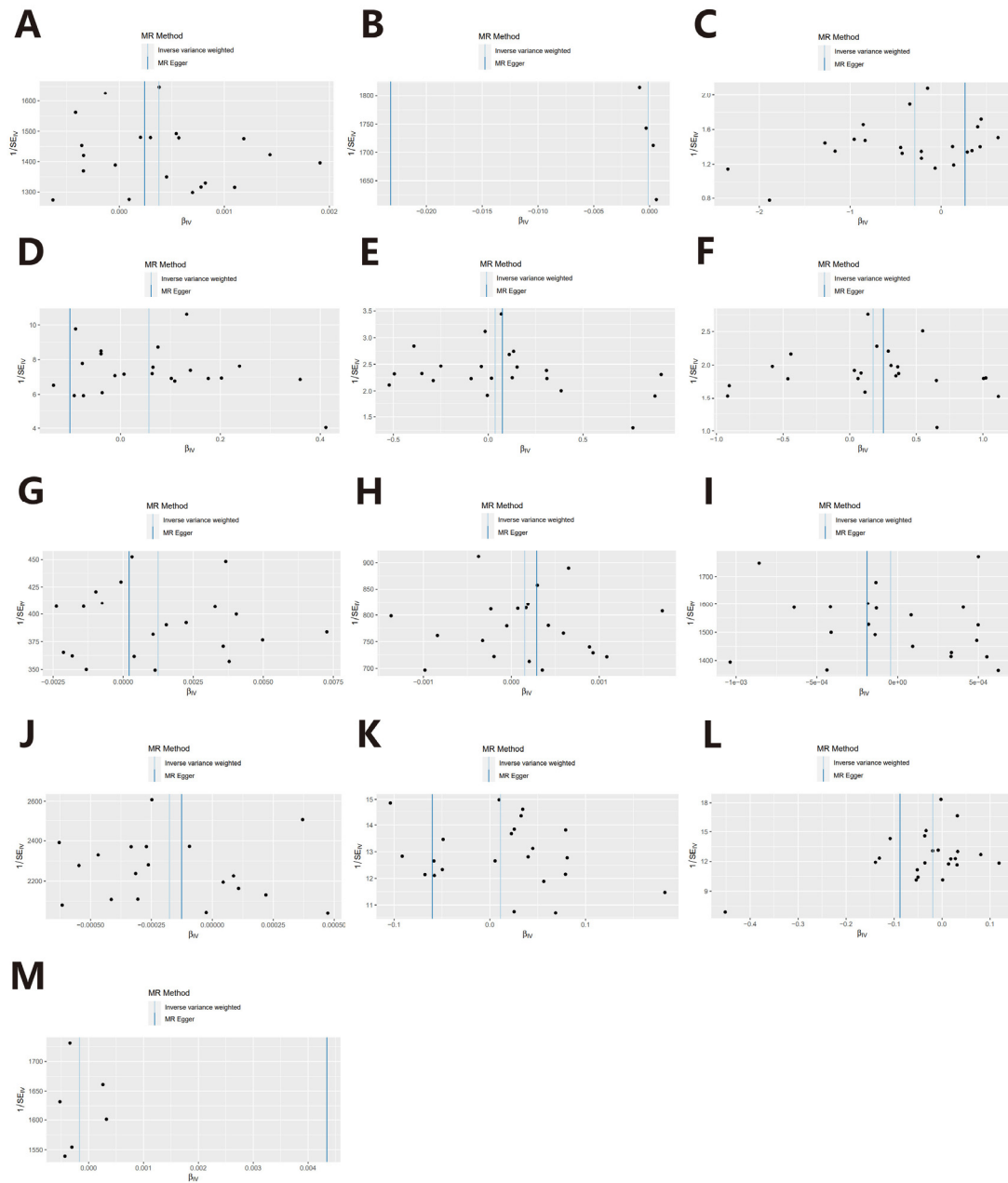
**Figure S1. Scatter plots of SNPs associated with HPV 16 E7 protein and risk on** (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.

## Supplementary Figure S2



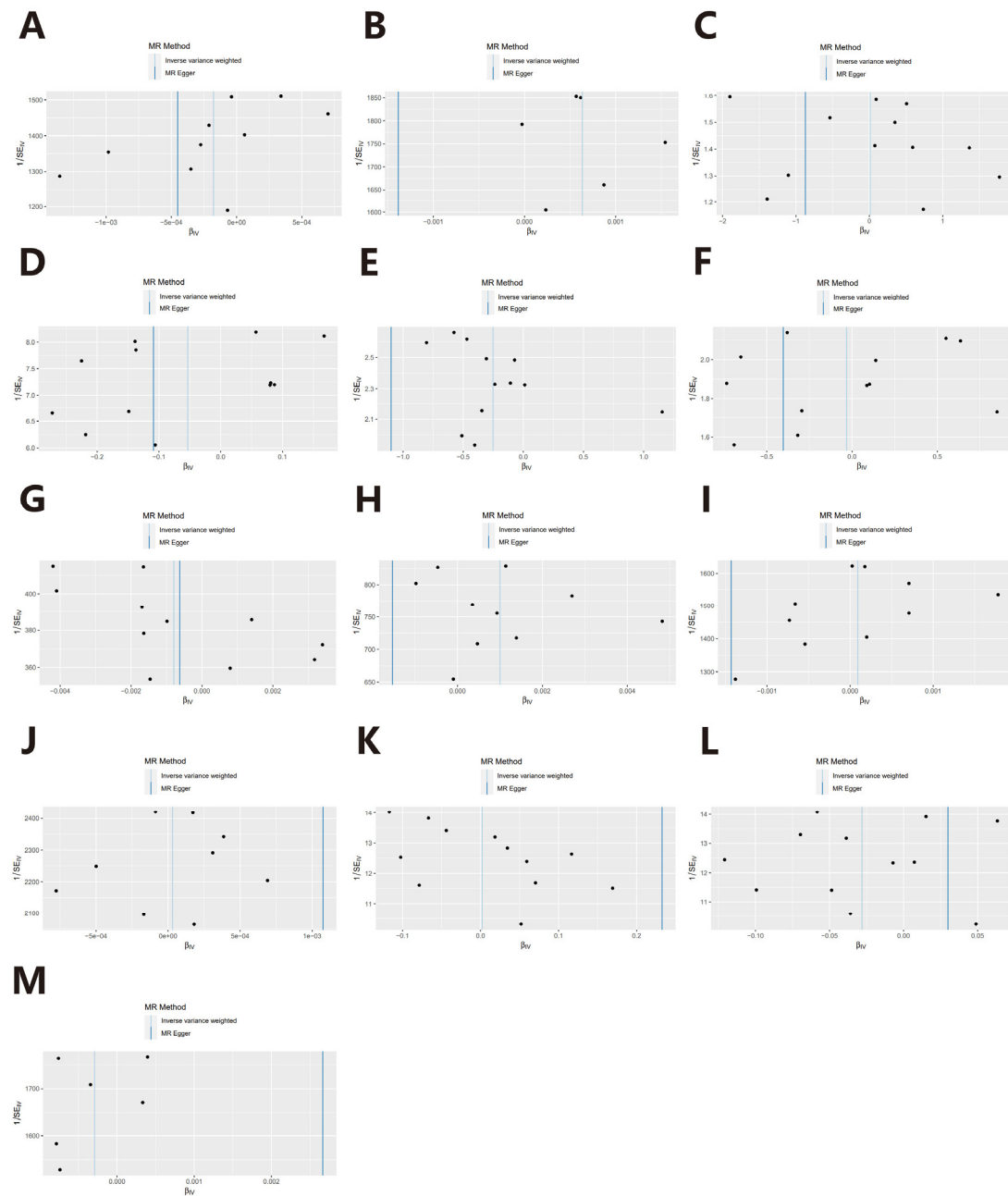
**Figure S2. Scatter plots of SNPs associated with HPV 18 E7 protein and risk on** (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.

## Supplementary Figure S3



**Figure S3. Funnel plots of the relationship between the causal effect of HPV 16 E7 protein and site-specific cancers.** (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.

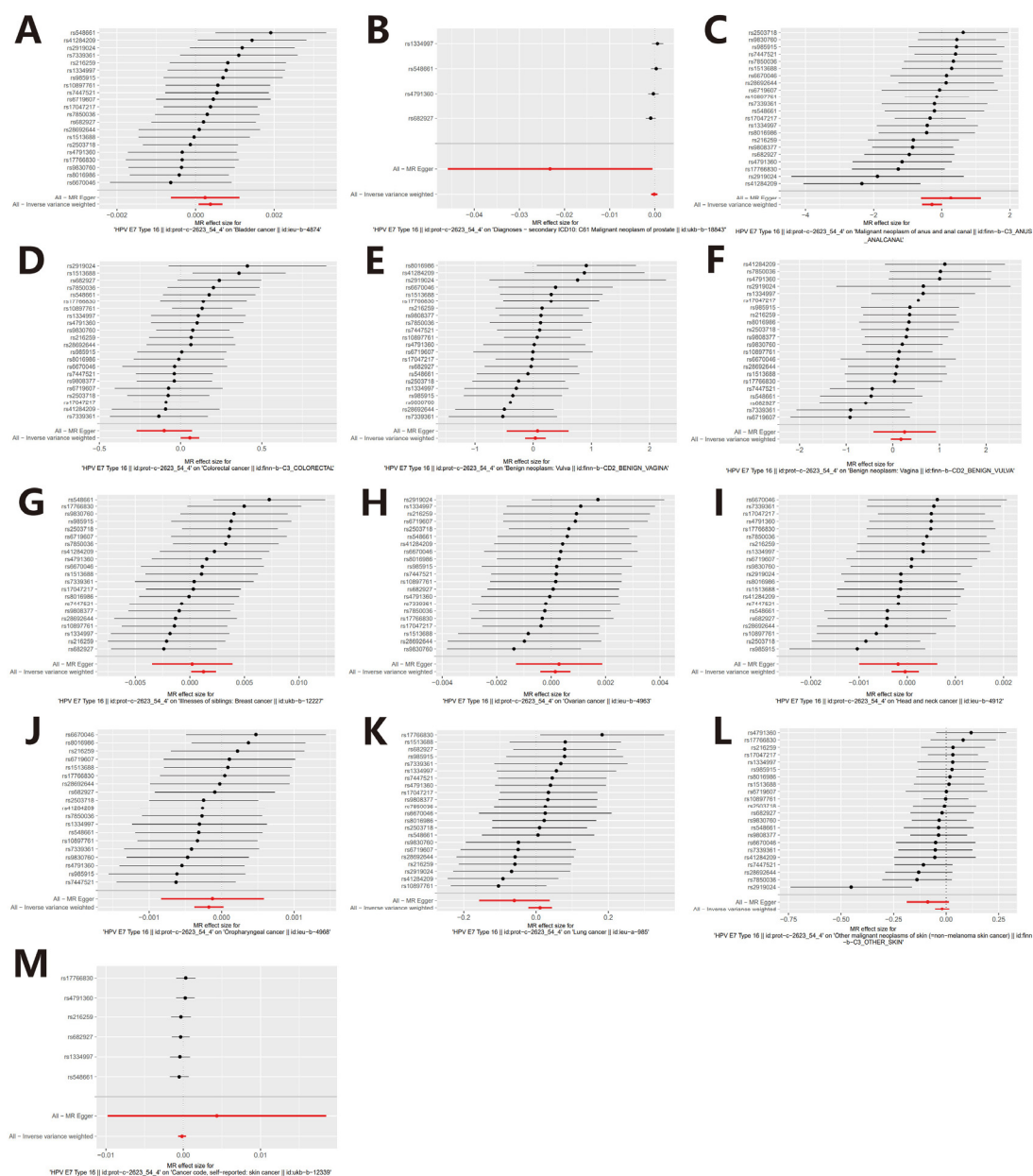
## Supplementary Figure S4



**Figure S4. Funnel plots of the relationship between the causal effect of HPV 18 E7 protein and site-specific cancers.** (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.

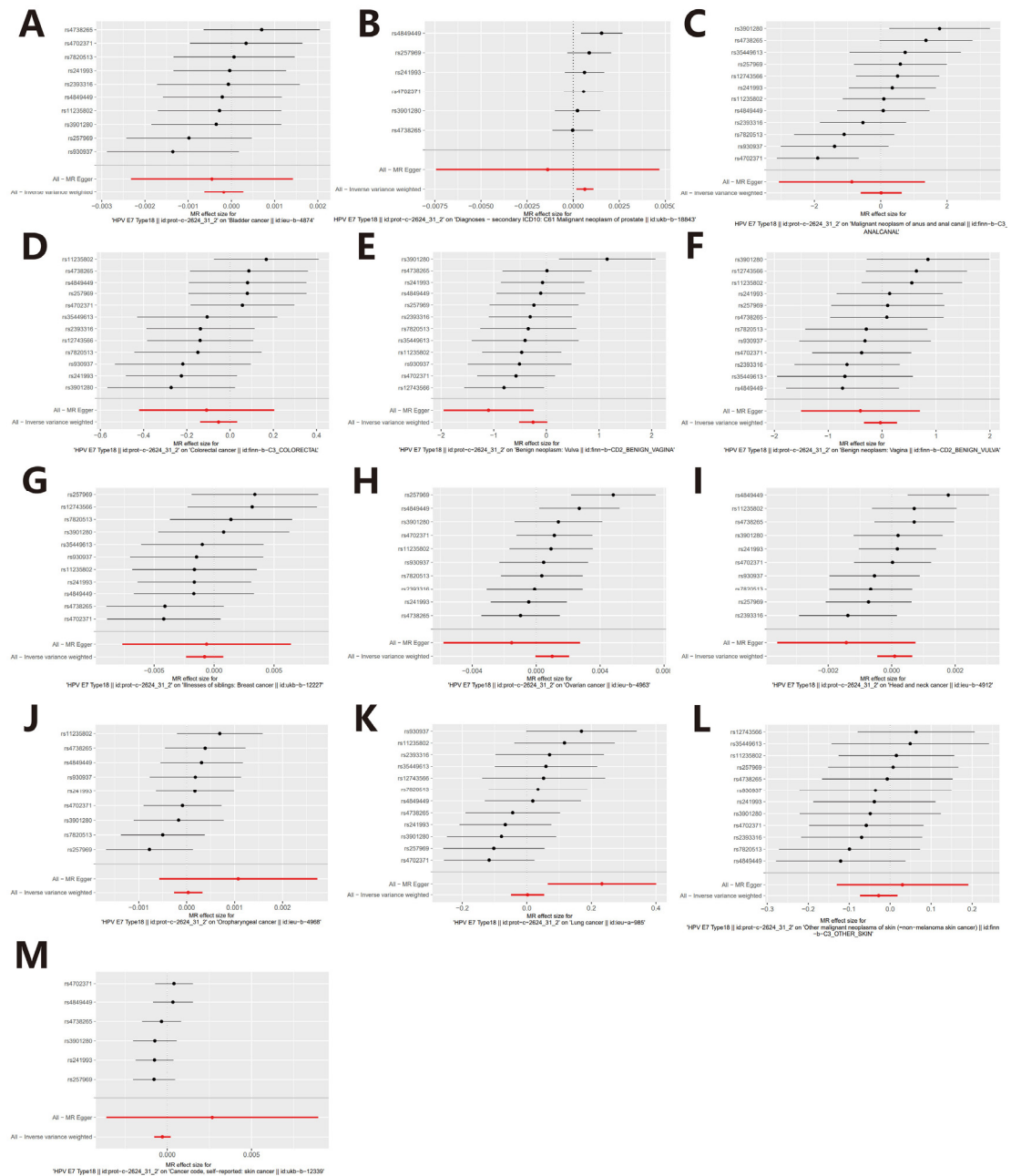


## Supplementary Figure S5



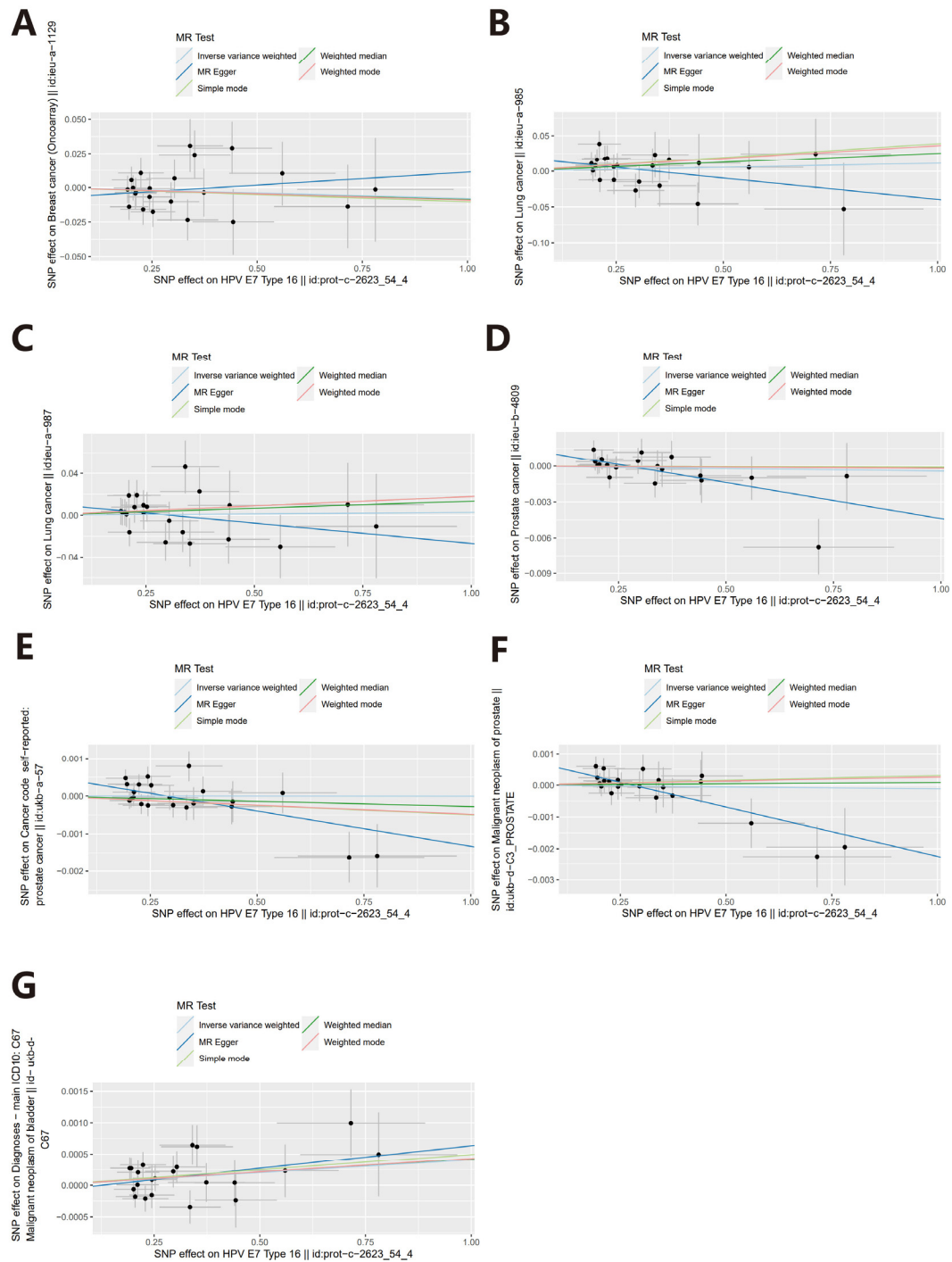
**Figure S5. Forest plots of each SNP and total effect of HPV 16 E7 protein on (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.**

## Supplementary Figure S6



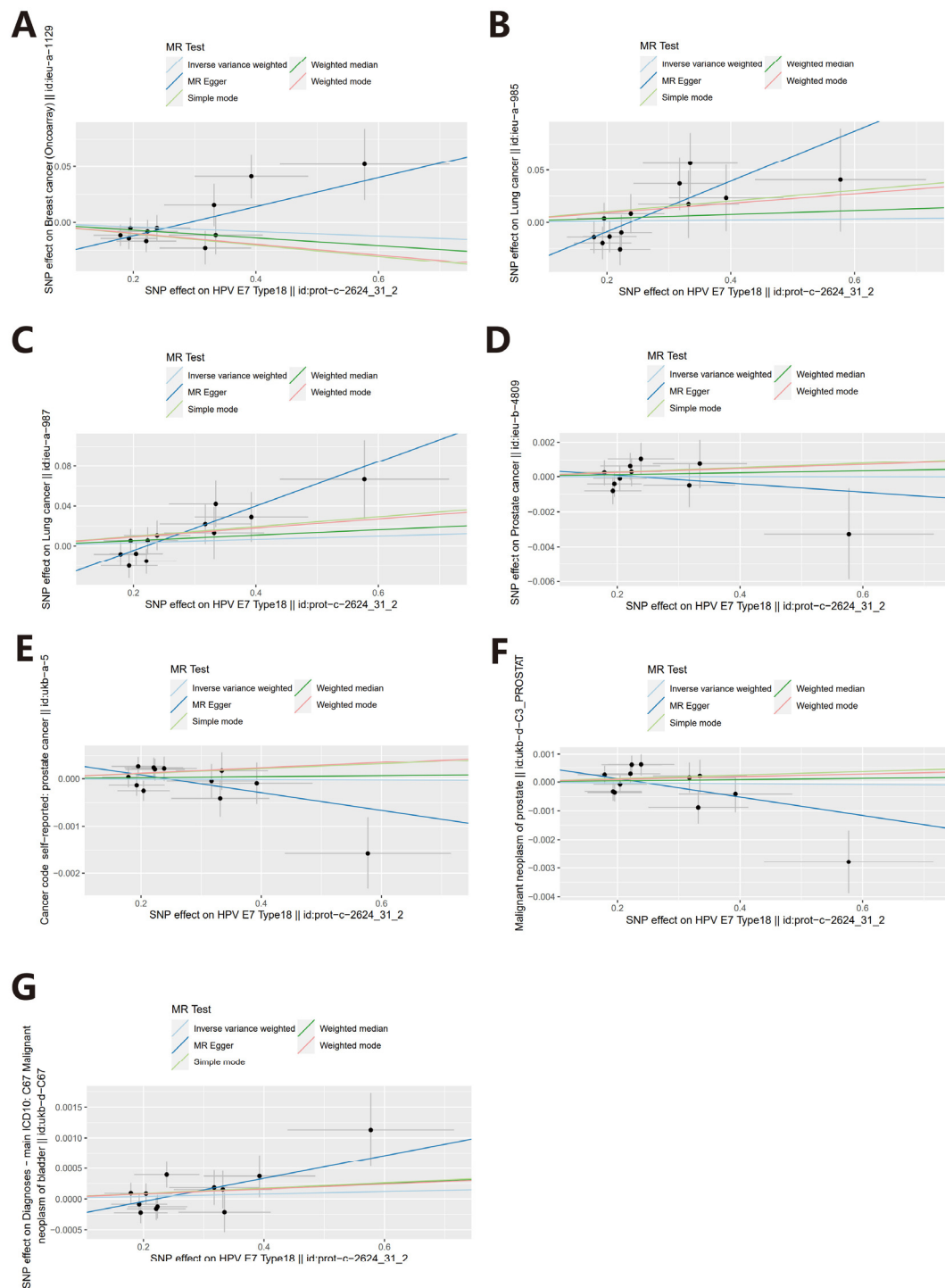
**Figure S6. Forest plots of each SNP and total effect of HPV 18 E7 protein on (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.**

## Supplementary Figure S7



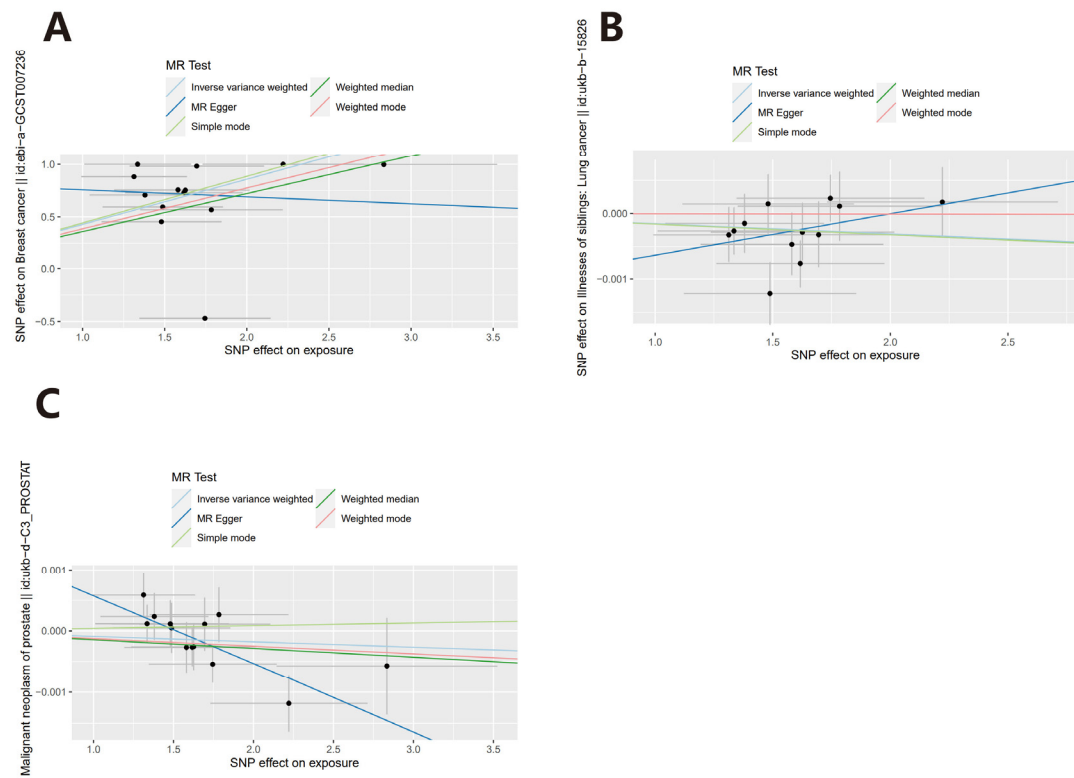
**Figure S7. Scatter plots of SNPs associated with HPV 16 E7 protein and risk on (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer for validation.**

## Supplementary Figure S8



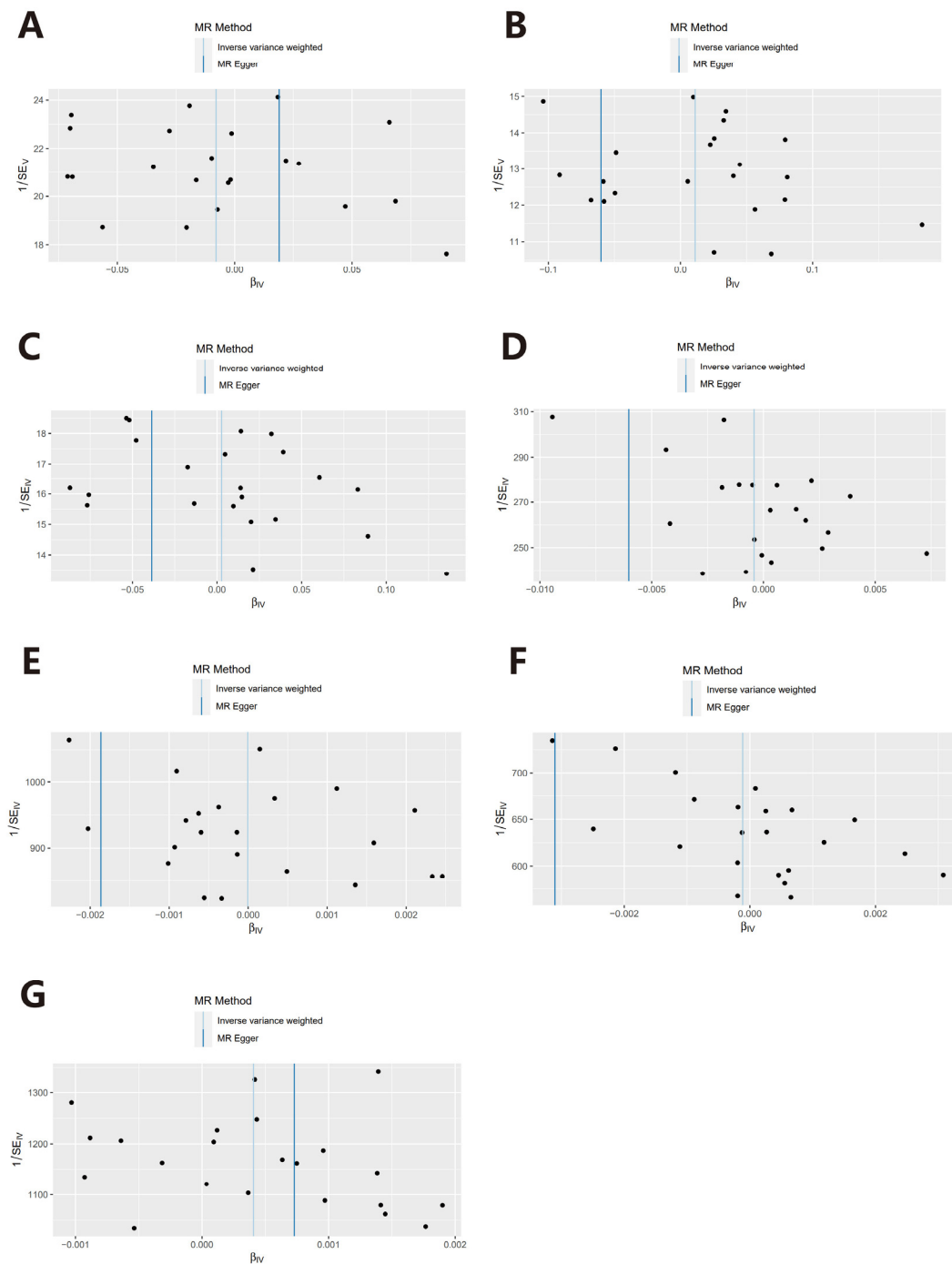
**Figure S8. Scatter plots of SNPs associated with HPV 18 E7 protein and risk on (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer for validation.**

## Supplementary Figure S9



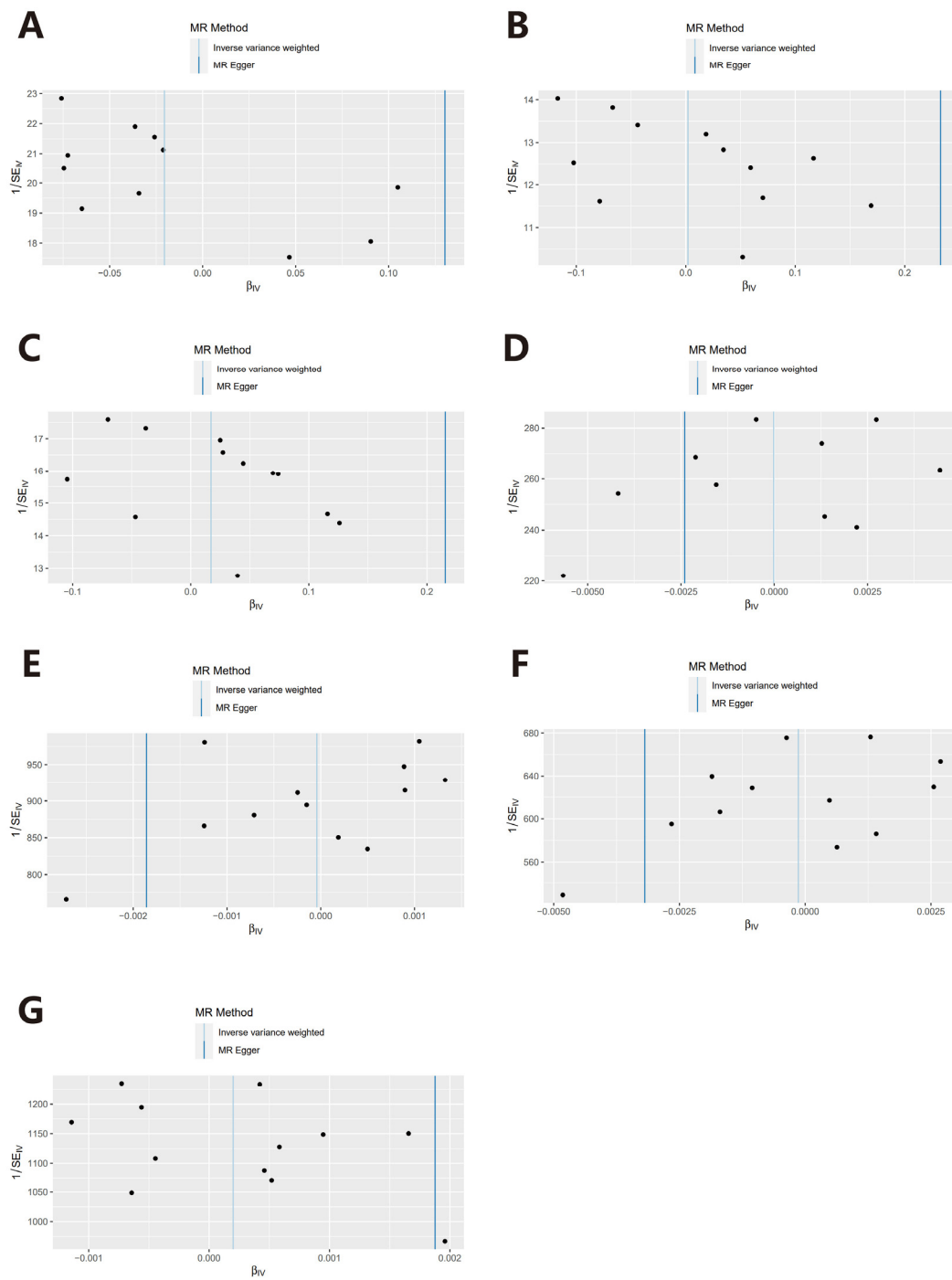
**Figure S9. Scatter plots of SNPs associated with HPV chronic infection and risk on (A) breast cancer; (B) lung cancer; (C) prostate cancer for validation.**

## Supplementary Figure S10



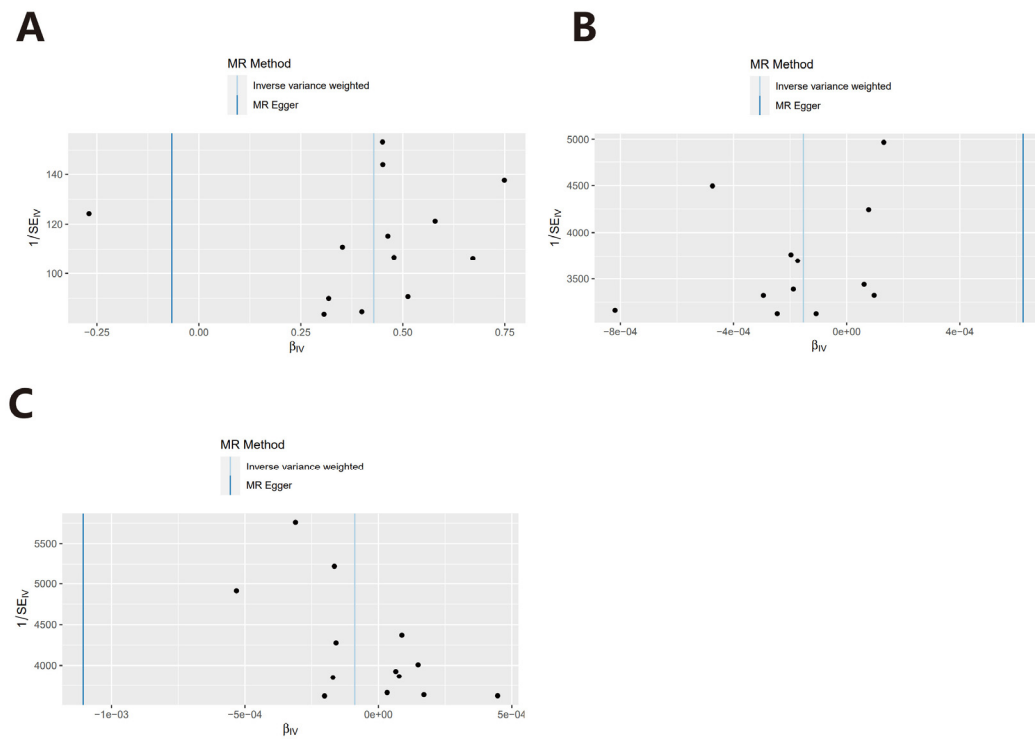
**Figure S10. Funnel plots of the relationship between the causal effect of HPV 16 E7 protein and site-specific cancers for validation.** (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer.

## Supplementary Figure S11



**Figure S11. Funnel plots of the relationship between the causal effect of HPV 18 E7 protein and site-specific cancers for validation. (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer.**

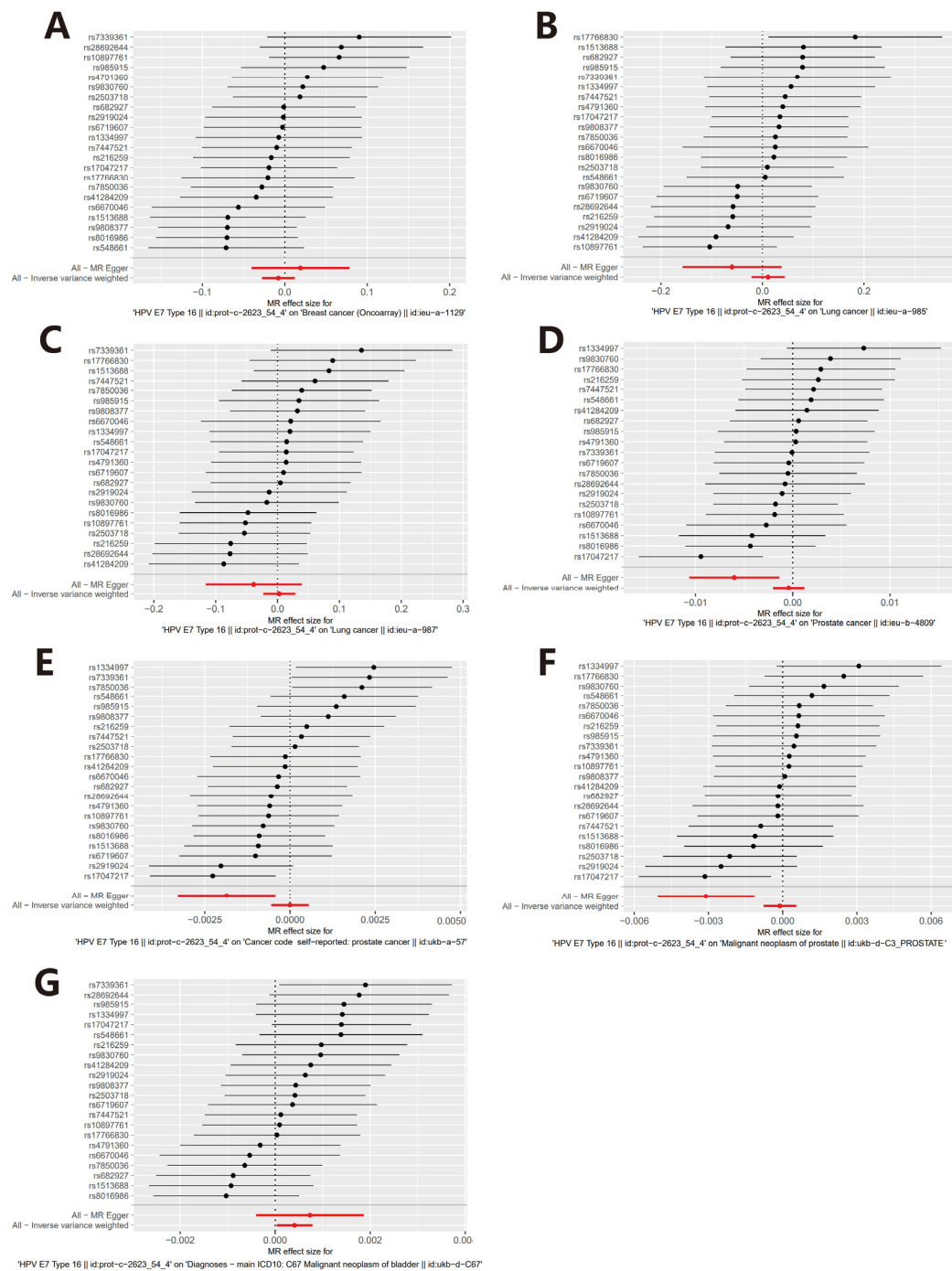
## Supplementary Figure S12



**Figure S12. Funnel plots of the relationship between the causal effect of HPV chronic infection and site-specific cancers for validation. (A) breast cancer; (B) lung cancer; (C) prostate cancer for validation.**

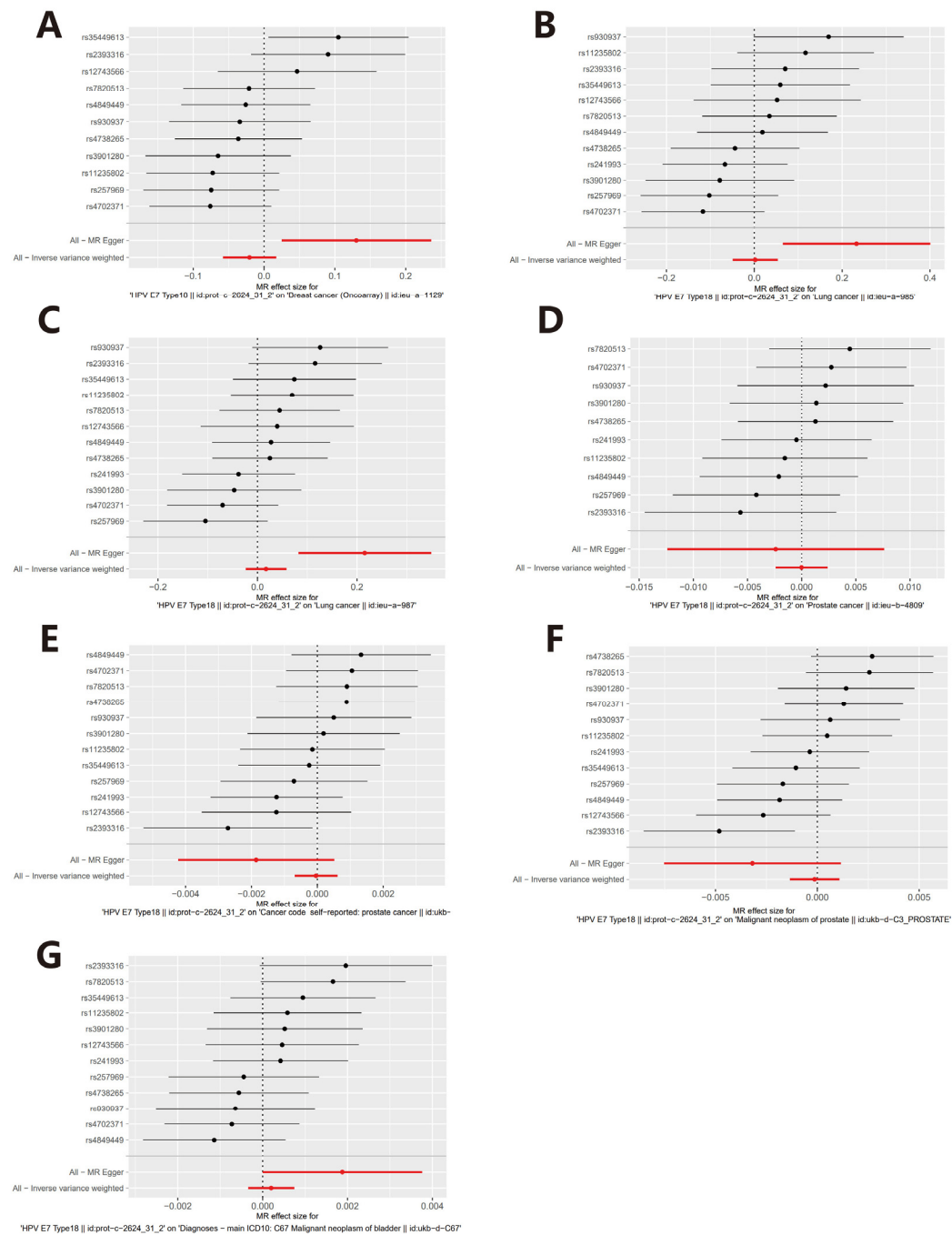


## Supplementary Figure S13



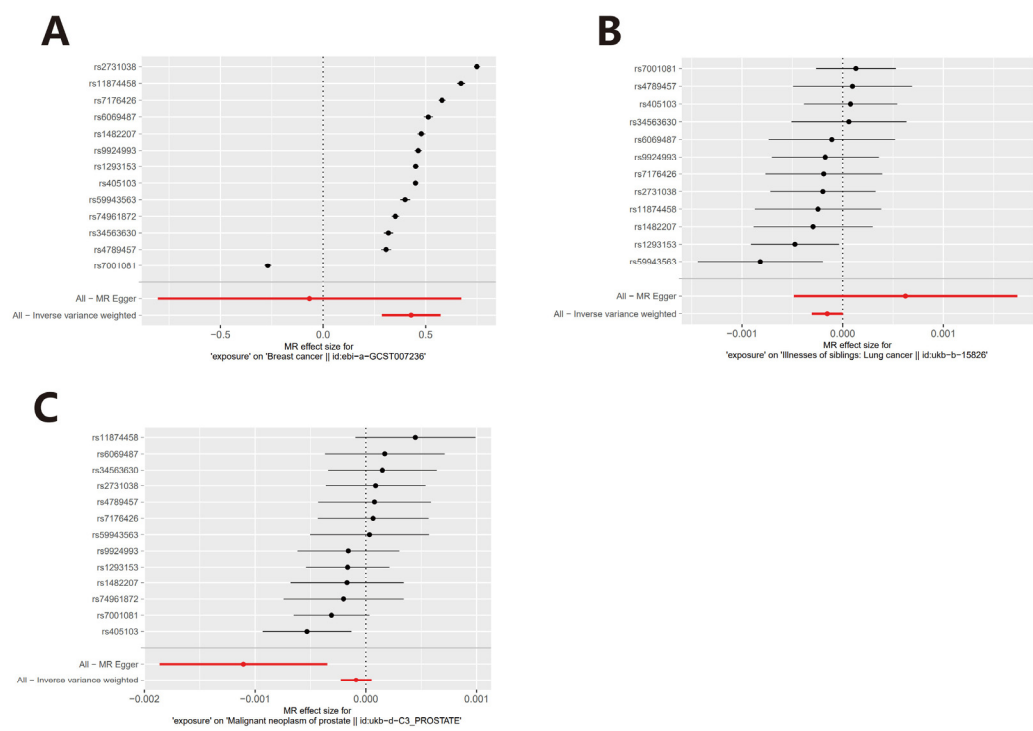
**Figure S13.** Forest plots of each SNP and total effect of HPV 16 E7 protein on (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer for validation.

## Supplementary Figure S14



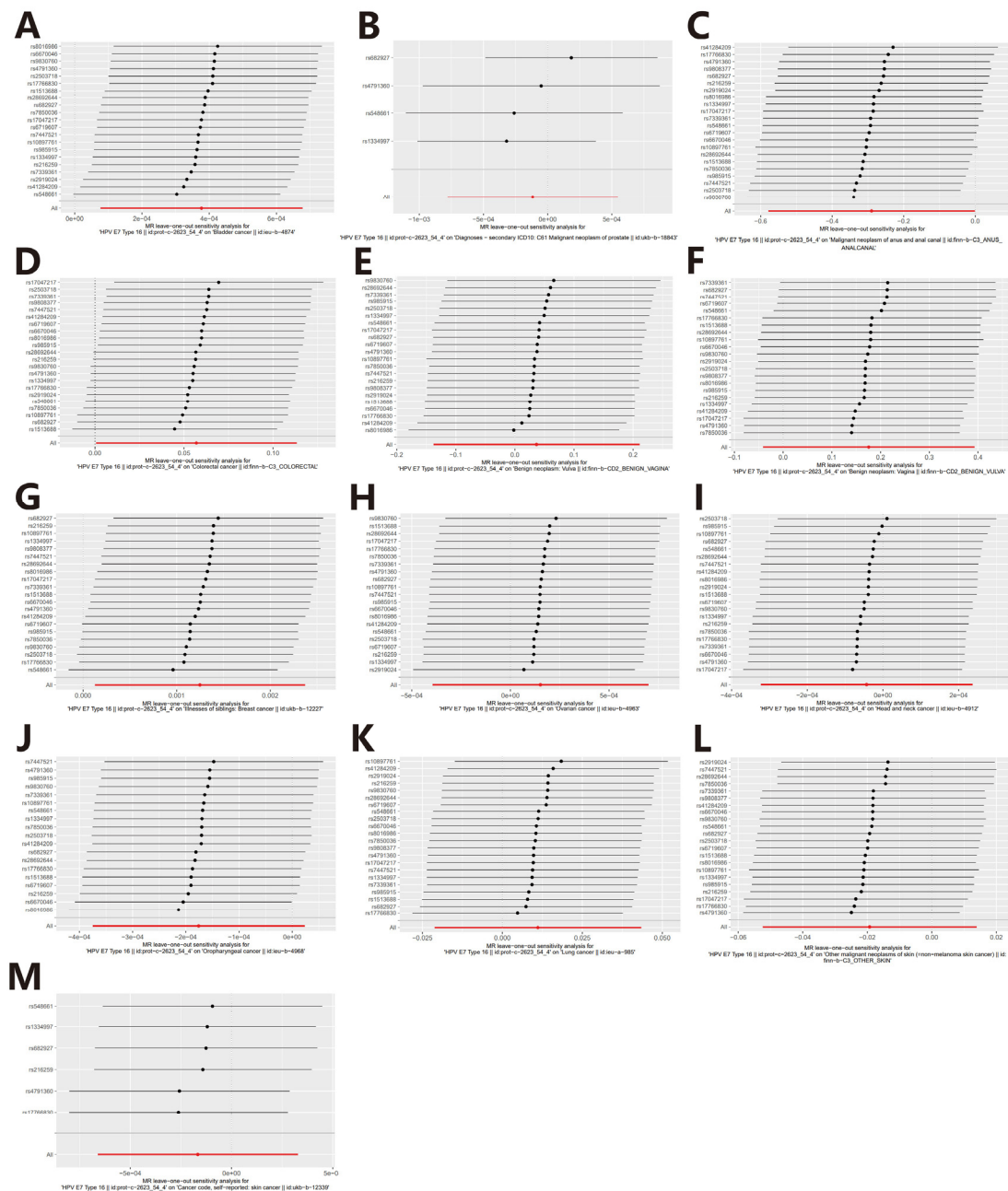
**Figure S14. Forest plots of each SNP and total effect of HPV 18 E7 protein on (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer for validation.**

Supplementary Figure S15



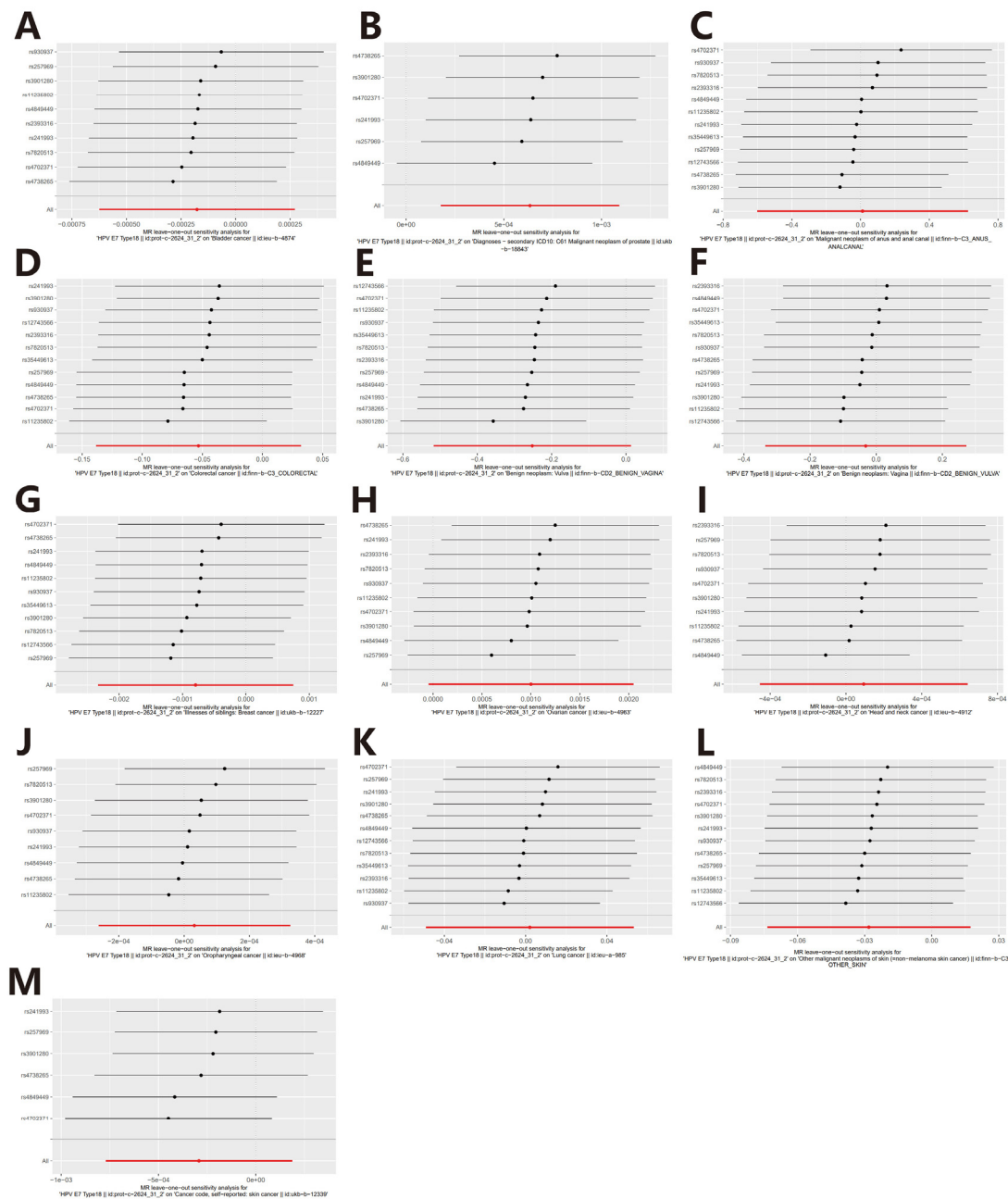
**Figure S15. Forest plots of each SNP and total effect of HPV chronic infection on (A) breast cancer; (B) lung cancer; (C) prostate cancer for validation.**

### Supplementary Figure S16



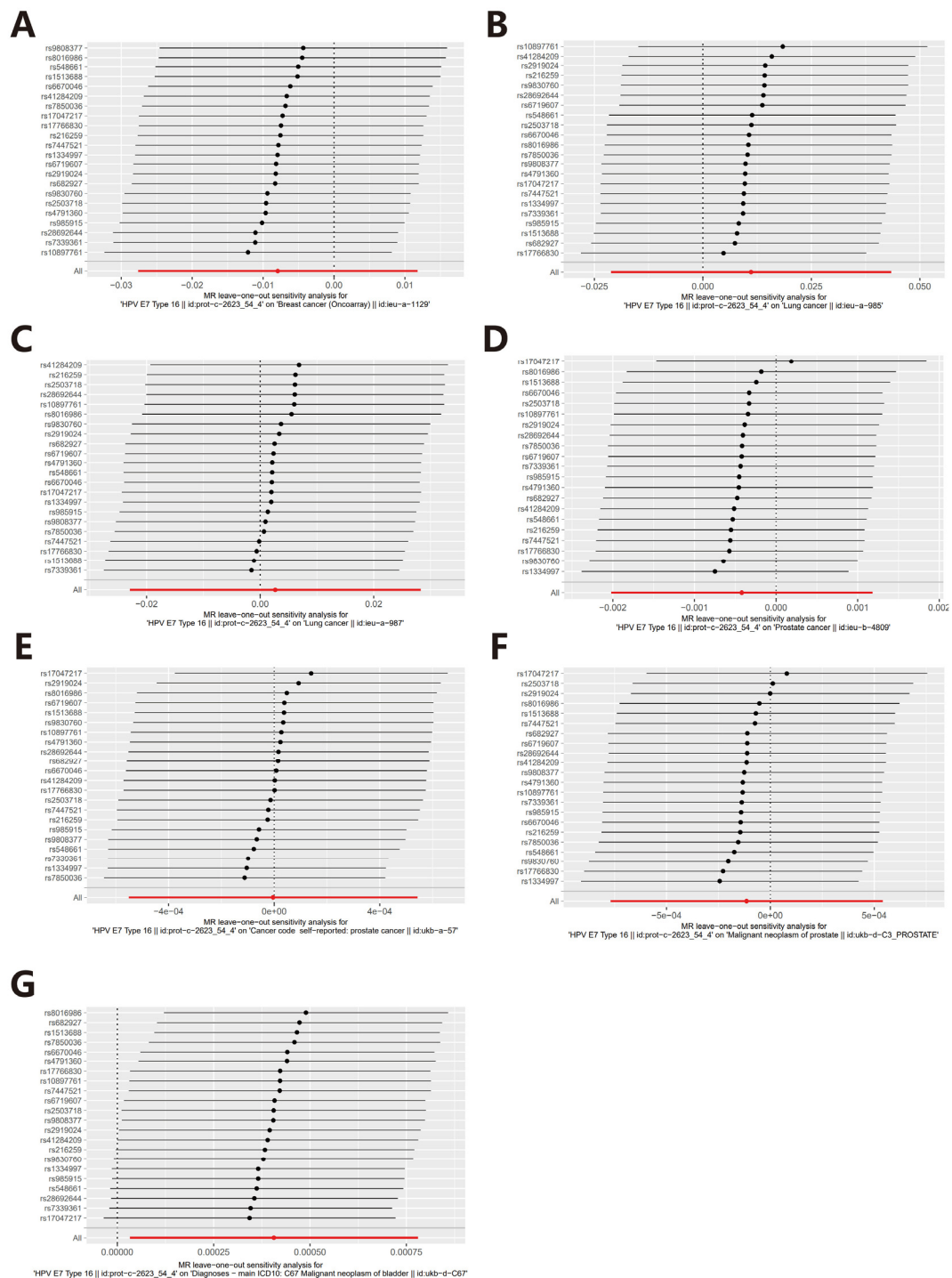
**Figure S16. Leave-one-out analysis results of SNPs associated with HPV 16 E7 protein and risk on** (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.

## Supplementary Figure S17



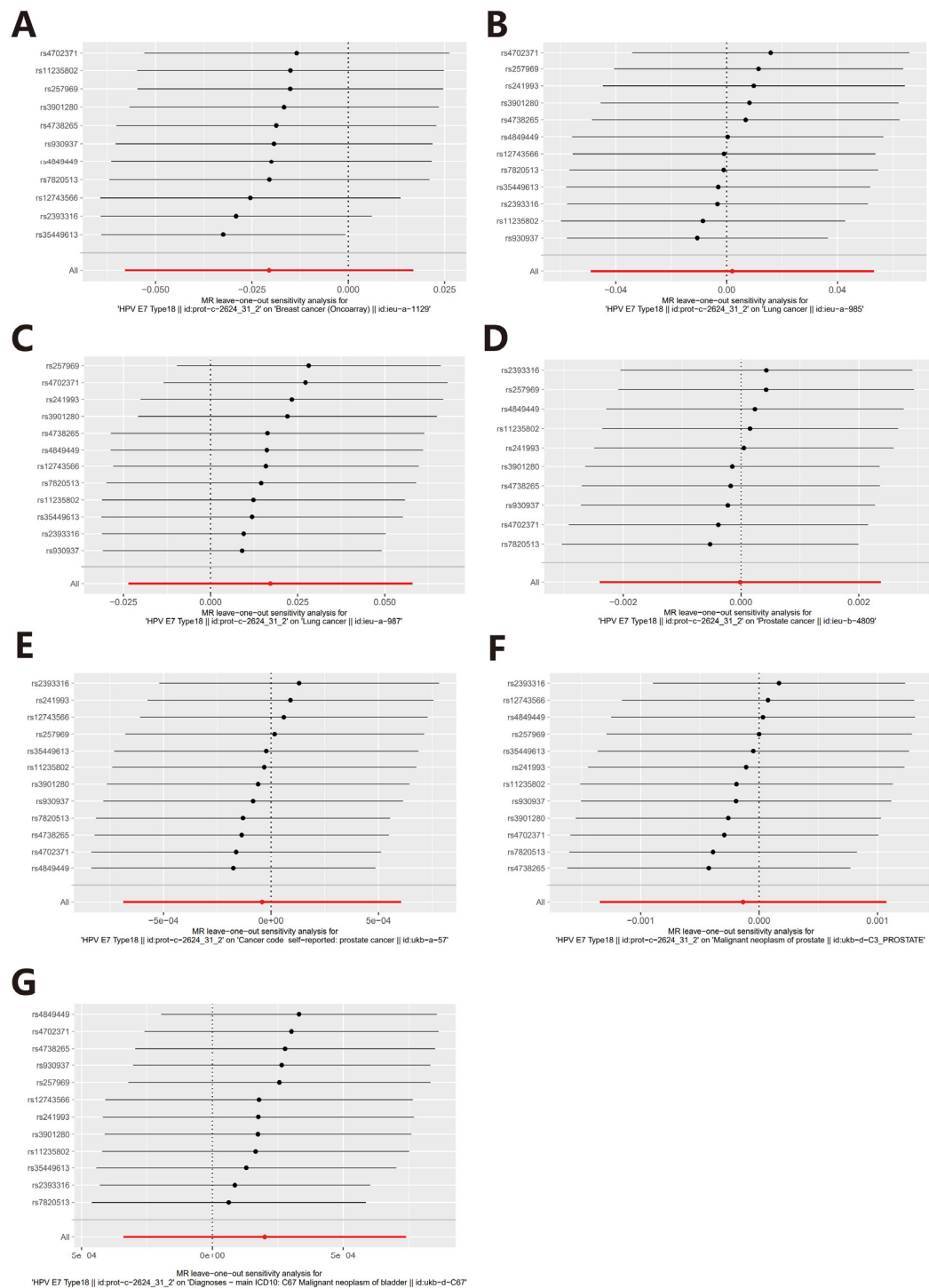
**Figure S17. Leave-one-out analysis results of SNPs associated with HPV 18 E7 protein and risk on (A) bladder cancer, (B) prostate cancer, (C) anal cancer, (D) colorectal cancer, (E) vaginal cancer, (F) vulvar cancer, (G) breast cancer, (H) ovarian cancer, (I) head and neck cancer, (J) oropharyngeal cancer, (K) lung cancer, (L) skin cancer (non-melanoma), (M) skin cancer incidence.**

## Supplementary Figure S18



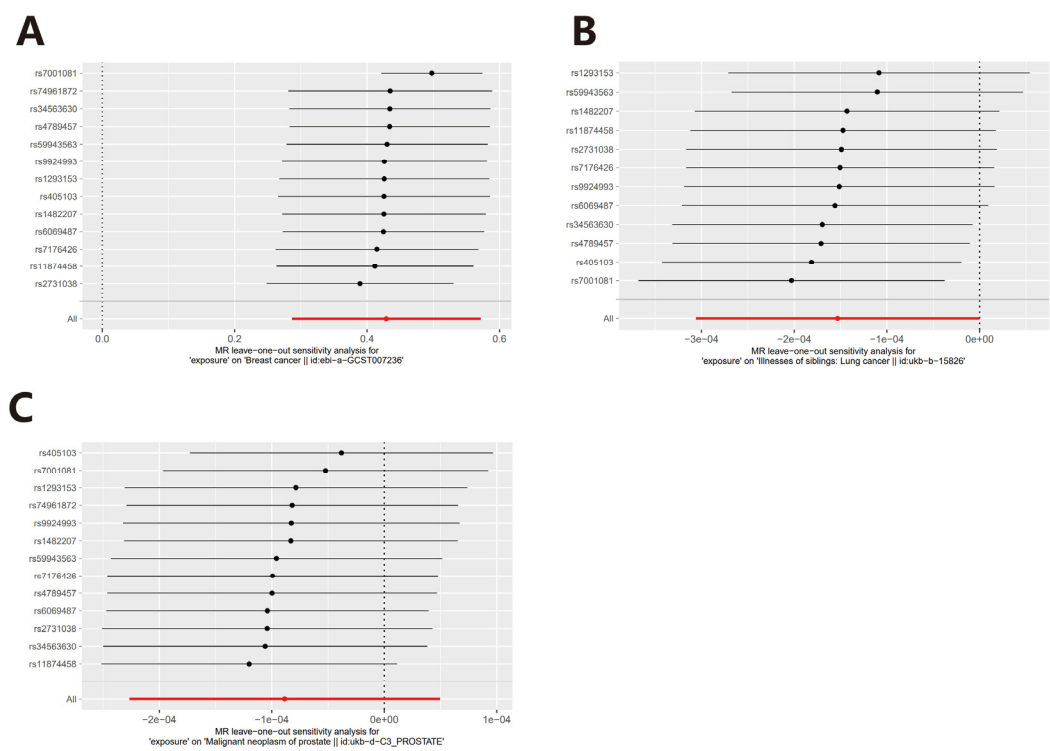
**Figure S18. Leave-one-out analysis results of SNPs associated with HPV 16 E7 protein and risk on (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer incidence for validation.**

## Supplementary Figure S19



**Figure S19. Leave-one-out analysis results of SNPs associated with HPV 18 E7 protein and risk on (A) breast cancer; (B) lung cancer; (C-E) prostate cancer; (F) bladder cancer incidence for validation.**

Supplementary Figure S20



**Figure S20. Leave-one-out analysis results of SNPs associated with HPV chronic infection and risk on (A) breast cancer; (B) lung cancer; (C) prostate cancer incidence for validation.**