Supplemental information

The accessible promoter-mediated supplementary effect of host factors provides new insight into the tropism of SARS-CoV-2

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Figure S1. Host factor genes expression profile across tissues. A. ACE2 expression profile across tissues. B. TMPRSS2 expression profile. C. NRP1 expression profile. D. BSG expression profile. E. CTSL expression profile. F. FURIN expression profile. Host factor genes expression of different tissues are from GTEx project. The red arrows indicate host factor genes expression in lung.
Figure S2. ACE2 and TMPRSS2 protein expression profile across tissues. A. ACE2 protein expression profile. B. TMPRSS2 protein expression profile. The protein expression scores are based on a best estimate of protein expression from a knowledge-based annotation as described in Human Protein Atlas. The red arrows indicate ACE2 and TMPRSS2 protein expression in lung.
Figure S3. The accessibility of ACE2 promoter across tissues and cell lines. A. The accessibility of ACE2 promoter in tumor tissues. B. The accessibility of ACE2 promoter in cancer cell lines. C. The accessibility of ACE2 promoter in normal cell lines.
Table S1. RNA sequencing data of ACE2 expression in multiple tissues

Table S2. Chromatin accessibility at the promoters of 6 host factor genes in 14 human tissue types

| TISSUE                        | IDENTIFIER                              | SEX    | AGE     |
|-------------------------------|------------------------------------------|--------|---------|
| Lung                          | ENSCR1411US_rep1_1_pe_bwa_biorep_filtered_peaks | female | 76_days |
| Lung                          | ENSCR214XJO_rep1_2_se_bwa_biorep_filtered_peaks | female | 120_days|
| Lung                          | ENSCR482HQE_rep1_3_se_bwa_biorep_filtered_peaks | female | 108_days|
| Lung                          | ENSCR076YBB_rep1_1_se_bwa_biorep_filtered_peaks | male   | 54_days |
| Lung                          | ENSCR318WOD_rep1_2_se_bwa_biorep_filtered_peaks | male   | 103_days|
| left_lung                     | ENSCR441OGH_rep1_2_se_bwa_biorep_filtered_peaks | male   | 87_days |
| left_lung                     | ENSCR960EJV_rep1_2_se_bwa_biorep_filtered_peaks | female | 110_days|
| right_lung                   | ENSCR803VCR_rep1_3_se_bwa_biorep_filtered_peaks | female | 91_days |
| right_lung                   | ENSCR947VPG_rep1_2_se_bwa_biorep_filtered_peaks | female | 87_days |
| right_lung                   | ENSCR441MMO_rep1_2_se_bwa_biorep_filtered_peaks | female | 110_days|
| right_lung                   | ENSCR228BOM_rep1_2_se_bwa_biorep_filtered_peaks | male   | 115_days|
| adrenal_gland                | ENSCR597NVK_rep1_1_pe_bwa_biorep_filtered_peaks | female | 53_years|
| adrenal_gland                | ENSCR866RCY_rep1_2_se_bwa_biorep_filtered_peaks | female | 85_days |
| brain                        | ENSCR420RUW_rep1_1_se_bwa_biorep_filtered_peaks | male   | 105_days|
| heart                         | ENSCR820XRX_rep1_2_se_bwa_biorep_filtered_peaks | female | 105_days|
| heart                         | ENSCR309FOO_rep1_1_se_bwa_biorep_filtered_peaks | female | 117_days|
| heart_left_ventricle          | ENSCR946DXB_rep1_1_pe_bwa_biorep_filtered_peaks | female | 103_days|
| heart_left_ventricle          | ENSCR501FWC_rep1_1_pe_bwa_biorep_filtered_peaks | female | 101_days|
| kidney                        | ENSCR262QJC_rep1_2_se_bwa_biorep_filtered_peaks | male   | 87_days |
| kidney                        | ENSCR774COE_rep1_1_pe_bwa_biorep_filtered_peaks | female | 105_days|
| large intestine              | ENSCR8214QEO_rep1_8_se_bwa_biorep_filtered_peaks | female | 91_days |
| large intestine              | ENSCR856XRP_rep1_1_se_bwa_biorep_filtered_peaks | female | 107_days|
| large intestine              | ENSCR857AEB_rep1_2_se_bwa_biorep_filtered_peaks | male   | 108_days|
| left_kidney                  | ENSCR120LWV_rep1_2_se_bwa_biorep_filtered_peaks | female | 98_days |
| left_kidney                  | ENSCR295DUI_rep1_2_se_bwa_biorep_filtered_peaks | female | 87_days |
| left_kidney                  | ENSCR600RAA_rep1_2_se_bwa_biorep_filtered_peaks | male   | 87_days |
| left_renal_cortex_interstitium | ENSCR92WMD_rep1_2_se_bwa_biorep_filtered_peaks | male   | 105_days|
| left_renal_cortex_interstitium | ENSCR588XI_rep1_1_se_bwa_biorep_filtered_peaks | male   | 105_days|
| left_renal_cortex_interstitium | ENSCR039ZQV_rep1_2_se_bwa_biorep_filtered_peaks | male   | 120_days|
| left_renal_pelvis            | ENSCR816FEC_rep1_3_se_bwa_biorep_filtered_peaks | male   | 105_days|
| left_renal_pelvis            | ENSCR318JAA_rep1_3_se_bwa_biorep_filtered_peaks | male   | 105_days|
| left_renal_pelvis            | ENSCR3308SVK_rep1_4_se_bwa_biorep_filtered_peaks | male   | 120_days|
| liver                        | ENSCR562FNN_rep2_1_pe_bwa_biorep_filtered_peaks | female | 113_days|
| liver                        | ENSCR158YXM_rep1_1_pe_bwa_biorep_filtered_peaks | female | 59_days |
| liver                        | ENSCR158YXM_rep2_1_pe_bwa_biorep_filtered_peaks | unknown| 80_days |
| muscle_of_arm                | ENSCR868XPR_rep1_2_se_bwa_biorep_filtered_peaks | male   | 115_days|
| muscle_of_arm                | ENSCR357PMV_rep1_1_pe_bwa_biorep_filtered_peaks | male   | 120_days|
| muscle_of_arm                | ENSCR753QKD_rep1_1_se_bwa_biorep_filtered_peaks | male   | 98_days |
| muscle_of_back               | ENSCR585CGU_rep1_2_se_bwa_biorep_filtered_peaks | male   | 105_days|
| muscle_of_back               | ENSCR766XFIK_rep1_2_se_bwa_biorep_filtered_peaks | male   | 108_days|
| muscle_of_back               | ENSCR317SIH_rep1_2_se_bwa_biorep_filtered_peaks | male   | 91_days |
| muscle_of_leg                | ENSCR199JXW_rep1_2_se_bwa_biorep_filtered_peaks | male   | 85_days |
| muscle_of_leg                | ENSCR286WIA_rep1_2_se_bwa_biorep_filtered_peaks | female | 105_days|
| muscle_of_leg                | ENSCR937RNV_rep1_2_se_bwa_biorep_filtered_peaks | male   | 115_days|
| muscle_of_trunk              | ENSCR217YJR_rep1_2_se_bwa_biorep_filtered_peaks | female | 120_days|
| muscle_of_trunk              | ENSCR409FZS_rep1_5_se_bwa_biorep_filtered_peaks | female | 113_days|
| muscle_of_trunk              | ENSCR411MGE_rep1_5_se_bwa_biorep_filtered_peaks | female | 121_days|
| placenta                     | ENSCR552KJL_rep1_1_pe_bwa_biorep_filtered_peaks | unknown| 102_days|
| placenta                     | ENSCR545KQR_rep1_2_se_bwa_biorep_filtered_peaks | female | 105_days|
| placenta                     | ENSCR802AJE_rep1_2_se_bwa_biorep_filtered_peaks | male   | 85_days |
| psoas_muscle                 | ENSCR425TPQ_rep1_1_rep1_2_se_bwa_biorep_filtered_peaks | male   | 3_years |
| psoas_muscle                 | ENSCR800ELO_rep1_1_se_bwa_biorep_filtered_peaks | male   | 35_years|
| psoas_muscle                 | ENSCR800ELO_rep2_1_se_bwa_biorep_filtered_peaks | male   | 27_years|
| Tissue                                    | Experiment ID     | Replicates | Sex   | Days        |
|------------------------------------------|-------------------|------------|-------|-------------|
| Renal cortex interstitium                | ENCSR932DHT       | rep1, 2    | female| 96 days     |
| Renal cortex interstitium                | ENCSR022ECC       | rep1, 2    | female| 96 days, v2|
| Renal cortex interstitium                | ENCSR656QYL       | rep1, 3    | female| 103 days    |
| Renal pelvis                             | ENCSR141DMX       | rep1, 1    | female| 96 days, v2|
| Retina                                   | ENCSR911YVV       | rep1, 2    | female| 89 days     |
| Retina                                   | ENCSR474GZQ       | rep1, 1    | unknown| 125 days    |
| Retina                                   | ENCSR474GZQ       | rep2, 1    | male  | 103 days    |
| Right kidney                             | ENCSR017TFH       | rep1, 1    | female| 87 days     |
| Right kidney                             | ENCSR414ZUA       | rep1, 3    | male  | 108 days    |
| Right renal cortex interstitium          | ENCSR014VAC       | rep1, 3    | male  | 105 days    |
| Right renal pelvis                       | ENCSR752NTF       | rep1, 2    | male  | 105 days    |
| Right renal pelvis                       | ENCSR761ZFA       | rep1, 3    | male  | 105 days, v2|
| Right renal pelvis                       | ENCSR540PVZ       | rep1, 3    | male  | 120 days    |
| Sigmoid colon                            | ENCSR276ITP       | rep1, 1    | female| 53 years    |
| Sigmoid colon                            | ENCSR462X1M       | rep1, 1    | female| 51 years    |
| Sigmoid colon                            | ENCSR391YAV       | rep1, 1    | female| 54 years    |
| Small intestine                          | ENCSR354FBA       | rep1, 2    | male  | 115 days    |
| Small intestine                          | ENCSR970ZLG       | rep1, 2    | male  | 87 days     |
| Small intestine                          | ENCSR457JLW       | rep1, 3    | female| 91 days     |
| Spinal cord                              | ENCSR788SOI       | rep1, 2    | male  | 96 days     |
| Spinal cord                              | ENCSR973MKT       | rep1, 1    | female| 87 days     |
| Spinal cord                              | ENCSR148MFM       | rep1, 2    | male  | 105 days    |
| Stomach                                  | ENCSR641ZPF       | rep1, 1    | male  | 51 years    |
| Stomach                                  | ENCSR163PKT       | rep1, 1    | male  | 54 years    |
| Stomach                                  | ENCSR930YSB       | rep1, 2    | female| 96 days     |
| Testis                                   | ENCSR978QUT       | rep1, 1    | male  | 54 years    |
| Testis                                   | ENCSR729DRB       | rep1, 2    | male  | unknown     |
| Testis                                   | ENCSR278FHCC      | rep1, 2    | male  | unknown, v2|
| Thymus                                   | ENCSR962EAP       | rep1, 2    | male  | 104 days    |
| Thymus                                   | ENCSR777USE       | rep1, 2    | female| 147 days    |
| Thymus                                   | ENCSR838IPF       | rep1, 3    | female| 105 days    |
### Table S3. ATAC-seq data for 23 types of tumors from The Cancer Genome Atlas project

| IDENTIFIER | TYPE | ATAC peaks in ACE2 promoter |
|------------|------|-----------------------------|
| ACC        | Adrenocortical carcinoma | chrX: 15618827-15619328 |
| BRCA       | Breast invasive carcinoma | chrX: 15620069-15620566 |
| COAD       | Colon adenocarcinoma | chrX: 15620032-15620533 |
| LUAD       | Lung adenocarcinoma | chrX: 15620032-15620533 |
| THCA       | Throid carcinoma | chrX: 15619987-15620488 |
| BLCA       | Bladder Urothelial Carcinoma | chrX: 15620065-15620583 |
| GBM        | Glialbloma multiforme | chrX: 15620065-15620583 |
| LGG        | Brain Lower Grade Glioma | chrX: 15620065-15620583 |
| CHOL       | Cholangiocarcinoma | chrX: 15620065-15620583 |
| ESCA       | Esophagal carcinoma | chrX: 15620065-15620583 |
| HNSC       | Head and Neck squamous cell carcinoma | chrX: 15620065-15620583 |
| KIRP       | Kidney renal clear cell carcinoma | chrX: 15620065-15620583 |
| LIHC       | Liver hepatocellular carcinoma | chrX: 15620065-15620583 |
| LUSC       | Lung squamous cell carcinoma | chrX: 15620065-15620583 |
| MESO       | Mesothelioma | chrX: 15620065-15620583 |
| PCPG       | Pheochromocytoma and Paraganglioma | chrX: 15620065-15620583 |
| PRAD       | Prostate adenocarcinoma | chrX: 15620065-15620583 |
| SKCM       | Skin Cutaneous Melanoma | chrX: 15620065-15620583 |
| STAD       | Stomach adenocarcinoma | chrX: 15620065-15620583 |
| TGCT       | Testicular Germ Cell Tumors | chrX: 15620065-15620583 |
| CESC       | Cervical squamous cell carcinoma and endocervical adenocarcinoma | chrX: 15620065-15620583 |
| UCEC       | Uterine Corpus Endometrial Carcinoma | chrX: 15620065-15620583 |

### Table S4. DNaseI-seq data in cancer cell lines from ENCODE

### Table S5. DNaseI-seq data in normal cell lines from ENCODE