Appendix A. Supplementary Data

Detailed analyses of the expression patterns of potential SARS-CoV-2 receptors in the human heart using single-nucleus RNA sequencing

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Supplementary Table 1. Basic information of human heart donors.

| ID | Age (years) | Gender | BMI (kg/m²) | Ethnicity | LVEF (%) |
|----|-------------|--------|-------------|-----------|----------|
| 1  | 39          | M      | 21.10727    | European  | 60       |
| 2  | 47          | F      | 28.32658    | European  | 60       |
| 3  | 51          | F      | 25.59374    | European  | 50       |
| 4  | 52          | F      | 24.24392    | European  | 75       |
| 5  | 54          | M      | 20.71569    | European  | 65       |
| 6  | 59          | M      | 19.78997    | European  | 60       |
| 7  | 60          | F      | 24.60938    | European  | 65       |

M= male, F= female, BMI= body mass index, LVEF= left ventricular ejection fraction
**Supplementary Table 2. The expression of accessory proteases in human heart.**

| Cell type                      | N_expressed ACE2 | N_total  | prop_TMPRSS2 | prop_TMPRSS4 | prop_TMPRSS11A | prop_TMPRSS11B | prop_FURIN | prop_CTS1 | prop_CTSB |
|-------------------------------|------------------|----------|--------------|--------------|----------------|----------------|------------|-----------|-----------|
| Fibroblast                    | 4219             | 83220    | 0.0021       | 0.0019       | 0.0028         | 0              | 0.0073    | 0.1346    | 0.0562    |
| Atrial Cardiomyocyte          | 187              | 34051    | 0.0053       | 0            | 0.0053         | 0              | 0.0054    | 0.0749    | 0.2567    |
| Ventricular Cardiomyocyte     | 1191             | 57906    | 0.0076       | 0.0050       | 0.0059         | 0.0008         | 0.0101    | 0.1360    | 0.1469    |
| Cytoplasmic Cardiomyocyte     | 346              | 30765    | 0            | 0            | 0.0058         | 0              | 0.0145    | 0.0896    | 0.1040    |
| Pericyte                      | 1531             | 18467    | 0.0013       | 0.0013       | 0.0013         | 0              | 0.0085    | 0.0281    | 0.0261    |
| Macrophage                    | 350              | 17468    | 0            | 0.0029       | 0.0057         | 0              | 0.0229    | 0.2543    | 0.5543    |
| Endothelium                   | 563              | 27923    | 0.0071       | 0            | 0.0018         | 0              | 0.0178    | 0.1563    | 0.1599    |
| Adipocyte                     | 377              | 8658     | 0.0027       | 0            | 0.0080         | 0              | 0.0239    | 0.2546    | 0.2838    |
| Vascular Smooth Muscle        | 72               | 5740     | 0.014        | 0            | 0              | 0              | 0.0278    | 0.1111    | 0.0972    |
| Neuronal                      | 32               | 1568     | 0            | 0            | 0              | 0              | 0.0313    | 0.0938    | 0.0313    |
| Lymphocyte                    | 13               | 1503     | 0            | 0            | 0              | 0              | 0         | 0         | 0.1546    |
Supplementary Table 3. The expression features of BSG in human heart.

| Cell type                  | Num_of_cells | Num_of_BSG_cells | Prop_of_BSG_cells |
|----------------------------|--------------|------------------|-------------------|
| Fibroblast                 | 83220        | 3050             | 0.036649844       |
| Atrial Cardiomyocyte       | 34051        | 4919             | 0.144459781       |
| Ventricular Cardiomyocyte  | 57906        | 16240            | 0.28045453        |
| Cytoplasmic Cardiomyocyte  | 30765        | 3844             | 0.12494718        |
| Pericyte                   | 18467        | 396              | 0.021443656       |
| Macrophage                 | 17468        | 712              | 0.040760247       |
| Endothelium                | 27923        | 1310             | 0.04691473        |
| Adipocyte                  | 8658         | 749              | 0.086509587       |
| Vascular Smooth Muscle     | 5740         | 156              | 0.0271777         |
| Neuronal                   | 1568         | 98               | 0.0625            |
| Lymphocyte                 | 1503         | 20               | 0.01330672        |
Supplementary Table 4. The expression features of HSPA5 in human heart.

| Cell type                      | Num_of_cells | Num_of_HSPA5_cells | Prop_of_HSPA5_cells |
|-------------------------------|--------------|--------------------|---------------------|
| Fibroblast                    | 83220        | 2477               | 0.02976448          |
| Atrial Cardiomyocyte          | 34051        | 1519               | 0.044609556         |
| Ventricular Cardiomyocyte     | 57906        | 2455               | 0.042396297         |
| Cytoplasmic Cardiomyocyte     | 30765        | 2605               | 0.084674143         |
| Pericyte                      | 18467        | 364                | 0.019710836         |
| Macrophage                    | 17468        | 559                | 0.032001374         |
| Endothelium                   | 27923        | 1049               | 0.037567597         |
| Adipocyte                     | 8658         | 468                | 0.054054054         |
| Vascular Smooth Muscle        | 5740         | 118                | 0.020557491         |
| Neuronal                      | 1568         | 60                 | 0.038265306         |
| Lymphocyte                    | 1503         | 26                 | 0.017298736         |
Supplementary Table 5. The expression features of HSPA5 in human heart.

| Cell type               | Num_of_cells | Num_of_KREMEN1_cells | Prop_of_KREMEN1_cells |
|-------------------------|--------------|----------------------|-----------------------|
| Fibroblast              | 83220        | 5676                 | 0.068204758           |
| Atrial Cardiomyocyte    | 34051        | 1538                 | 0.045167543           |
| Ventricular Cardiomyocyte| 57906        | 4504                 | 0.077781232           |
| Cytoplasmic Cardiomyocyte| 30765        | 667                  | 0.021680481           |
| Pericyte                | 18467        | 318                  | 0.017219906           |
| Macrophage              | 17468        | 736                  | 0.042134188           |
| Endothelium             | 27923        | 855                  | 0.030619919           |
| Adipocyte               | 8658         | 499                  | 0.057634558           |
| Vascular Smooth Muscle  | 5740         | 133                  | 0.023170732           |
| Neuronal                | 1568         | 54                   | 0.034438776           |
| Lymphocyte              | 1503         | 25                   | 0.0166334             |