

## **SUPPLEMENTARY FIGURE LEGENDS**

### **Supplementary Figure 1:**

**A:** Violin plot showing the age of patients suffering from at least one comorbidity (n=42) vs. patients without comorbidity (n=15).

**B:** Violin plots showing the age of patients suffering from the indicated comorbidity vs. patients without this comorbidity.

**C:** Violin and box plots depicting median counts and 25th and 75th percentile of lymphocytes of COVID-19 patients with specific comorbidity vs. COVID-19 patients without this specific comorbidity.

**D:** Violin and box plots depicting median counts and 25th and 75th percentile of granulocytes of COVID-19 patients with specific comorbidity vs. COVID-19 patients without this specific comorbidity.

### **Supplementary Figure 2:**

**A-G:** UpSet plot to visualize co-occurrence of comorbidities in individual patients with a specific comorbidity. Black dots connected by black lines represent the different comorbidity combinations. Bar plots on top display the number of patients per comorbidity-combination. Bar plots on the left display the total number of patients per comorbidity within the indicated cohort.

**H:** Correlogram of all severe COVID-19-associated immune features and the age (years) of COVID-19 patients.

**I:** Correlation between value of indicated immune feature and the age of COVID-19 patients.

### **Supplementary Figure 3:**

**A:** Median frequency or median expression and 25th and 75th percentiles of the indicated parameters in indicated FlowSOM-generated immune cell clusters. Comparison of samples from male vs. female patients.

**B:** Median expression and 25th and 75th percentiles of the indicated parameters in indicated FlowSOM-generated immune cell clusters. Comparison of samples from male vs. female patients overall (left panels) and within a specific comorbidity group (right panels).

**C:** Box plot showing the according median severity and 25th and 75th percentiles of samples from female or male patients in indicated comorbidity groups.

Significant p values are depicted using an asterisk (\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$  and \*\*\*\* =  $p < 0.0001$ , Mann-Whitney test, BH correction).

#### **Supplementary Figure 4:**

**A:** UpSet plot to visualize co-occurrence of comorbidities in individual patients with cancer. Black dots connected by black lines represent the different comorbidity combinations. Bar plots on top display the number of patients per comorbidity-combination. Bar plots on the left display the number of patients per comorbidity within the cancer cohort.

**B:** Dot plot displaying ES of severe vs. mild COVID-19 (x axis) against ES of indicated comorbidity vs. without indicated comorbidity (y axis). Each dot represents one immunological feature, colored for the affected immune compartment. The black box highlights immune features for further in-depth analysis.

**C:** Median frequency and 25th and 75th percentiles of the indicated parameters in indicated FlowSOM-generated immune cell clusters. Comparison of cancer, no cancer and healthy controls.

Significant p values are depicted using an asterisk (\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$  and \*\*\*\* =  $p < 0.0001$ , Mann-Whitney test, BH correction).

#### **Supplementary Figure 5:**

**A-C:** Median frequency or median expression and 25th and 75th percentiles of the indicated parameters in indicated FlowSOM-generated immune cell clusters. Comparison of obesity, no obesity and healthy controls in **(A)**, hypertension, no hypertension and healthy controls in **(B)**, T2DM, no T2DM and healthy controls in **(C)**.

Significant p values are depicted using an asterisk (\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$  and \*\*\*\* =  $p < 0.0001$ , Mann-Whitney test, BH correction).

#### **Supplementary Figure 6:**

**A:** Median frequency and 25th and 75th percentiles of the indicated parameters in indicated FlowSOM-generated immune cell clusters. Comparison of lung-associated disorder, no lung-associated disorder and healthy controls.

Significant p values are depicted using an asterisk (\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$  and \*\*\*\* =  $p < 0.0001$ , Mann-Whitney test, BH correction).

#### **Supplementary Figure 7:**

**A:** Tabular overview of clinical characteristics of all samples from COVID-19 patients with chronic kidney disease.

**B-I:** Median expression and 25th and 75th percentiles of indicated parameters in indicated FlowSOM-generated immune cell clusters. Comparison of chronic kidney disease, no chronic kidney disease and healthy controls in **(B-F)**, immune disorder, no immune disorder and healthy controls in **(G-I)**.

Significant p values are depicted using an asterisk (\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$  and \*\*\*\* =  $p < 0.0001$ , Mann-Whitney test, BH correction).