**Supplementary Figure Legends**

# Supplementary Figure 1: Senescence Proteins with Significant Differences in their Plasma Concentrations in Severe WHO Classified Patients

**(A)** Heatmap and **(B)** Volcano plot showing all differentially regulated senescence specific proteins in severe WHO classified patients versus mild WHO classified patients ≤8 weeks since their positive PCR test. **(C)** Box plots for the top 8 differentially regulated senescence specific proteins in severe WHO classified patients versus mild WHO classified patients ≤8 weeks since their positive PCR test. **(D)** Heatmap and **(E)** Volcano plot showing all differentially regulated senescence specific proteins in severe WHO classified patients versus mild WHO classified patients >8 weeks since their positive PCR test. **(F)** Box plots for the top 8 differentially regulated senescence specific proteins in severe WHO classified patients versus mild WHO classified patients >8 weeks since their positive PCR test.

# Supplementary Figure 2: PCA Plots for Senescence Proteins with Significant Differences in their Plasma Concentrations in Hospitalised, Severe WHO Classified and Aged Patients

Principal component analysis (PCA) plots for differentially regulated senescence specificproteins in **(A)** hospitalised patients ≤8 weeks since their positive PCR test, **(B)** hospitalised patients >8 weeks since their positive PCR test, **(C)** severe WHO classified patients ≤8 weeks since their positive PCR test, **(D)** severe WHO classified patients >8 weeks since their positive PCR test, **(E)** aged (>50 years old) patients ≤8 weeks since their positive PCR test and **(F)** aged (>50 years old) patients ≤8 weeks since their positive PCR test.

# Supplementary Figure 3: Pathway Analysis of Senescence Proteins with Significant Differences in their Plasma Concentrations

Pathway analysis of all the significantly differentially regulated senescence proteins in severe WHO classified patients **(A)** ≤8 weeks since their positive PCR test and **(B)** >8 weeks since their positive PCR test.

# Supplementary Figure 4: Persistent Signatures

Receiver operating characteristic (ROC) curve of levels of the whole panel signature (n=5 proteins) versus a senescence specific signature (n=5 proteins) based on their WHO COVID-19 classification status **(A)** ≤8 weeks or **(B)** >8 weeks since their positive PCR test.

# Supplementary Table 1: Summary of Patient Characteristics for Methylome Analysis

Table summarizing the patient characteristics of the patients (n=450) included in the methylation study. Demographics described include hospitalisation status, age, gender and WHO COVID-19 classification (patients were classified according to the World Health Organisation (WHO) clinical progression score established by the WHO Working Team 2020).

# Supplementary Figure 5: Methylation Associated Analysis

**(A)** Chronological age was correlated with biological age using the Horvath skin clock methylation age and data was normalised as shown in the QQ plot**. (B)** Correlation betweenchronological age and biological age in ≤50 years old compared to >50 years old patients. **(C)** Levels of methylation across the promotor region of all senescence specific proteins (n=27) in hospitalised patients compared to non-hospitalised patients. **(D)** Levels of methylation across the promotor region of all senescence specific proteins (n=26) in patients ≤8 weeks since their positive PCR test compared to patients >8 weeks since their positive PCR test.