



Supplementary Figure 12: Comparative quantile-quantile plots for the real proteomics dataset to verify the goodness of fit between observed and target moments under an arbitrary equal-mean/homoscedastic model (here from a reference standard Gaussian distribution  $N(0, 1)$ ). When this is the case, estimated quantiles from observed data line up with those of the reference distribution. Observed transformed means (Top Row) and standard deviations (Bottom row) by MVR and CVSR regularization methods. Red line: inter-quartile line. One-sample two-sided Kolmogorov-Smirnov-test statistics are reported in boxes.