

**Supplementary Table S4** Impact of genes encoding enzymes for glutathione biosynthesis on expression levels of genes for protein folding and unfolded protein response in pancreatic  $\beta$ -cells of non-diabetics and diabetic patients (Dataset 2)

| Independent gene<br>(glutathione biosynthesis) | Dependent gene<br>(protein folding<br>/unfolded protein<br>response) | <i>beta</i> | Standard<br>error of<br><i>beta</i> | R <sup>2</sup> | P-value       | FDR<br>adjusted P-<br>value (Q-<br>value) |
|--|--|-------------|-------------------------------------|----------------|---------------|---|
| Diabetic patients                              |  |             |                                     |                |               |   |
| <i>GCLC</i>                                    | <i>DNAJA2</i>  | -0.825      | 0.283                               | 0.681          | <b>0.04</b>   | 0.34                                      |
| <i>GCLC</i>                                    | <i>HSPB1</i>   | -0.817      | 0.288                               | 0.668          | <b>0.047</b>  | 0.36                                      |
| <i>GCLC</i>                                    | <i>NUP153</i>  | 0.982       | 0.094                               | 0.964          | <b>0.0005</b> | <b>0.047</b>                              |
| <i>GCLC</i>                                    | <i>NUP58</i>   | 0.857       | 0.258                               | 0.734          | <b>0.029</b>  | 0.27                                      |
| <i>GCLC</i>                                    | <i>TPR</i>   | 0.956       | 0.147                               | 0.914          | <b>0.0028</b> | 0.11                                      |
| <i>GCLC</i>                                    | <i>DNAJB1</i>  | -0.815      | 0.289                               | 0.665          | <b>0.048</b>  | 0.36                                      |
| <i>GCLM</i>                                    | <i>POM121C</i>   | 0.992       | 0.063                               | 0.984          | <b>0.0001</b> | <b>0.01</b>                               |
| <i>GCLM</i>                                    | <i>RPA2</i>  | 0.883       | 0.235                               | 0.780          | <b>0.019</b>  | 0.18                                      |
| <i>GCLM</i>                                    | <i>CREB3L4</i>   | 0.881       | 0.236                               | 0.776          | <b>0.02</b>   | 0.18                                      |
| <i>GCLM</i>                                    | <i>EIF2S1</i>  | 0.906       | 0.211                               | 0.821          | <b>0.01</b>   | 0.18                                      |
| <i>GCLM</i>                                    | <i>PPP1R15A</i>  | 0.942       | 0.167                               | 0.888          | <b>0.004</b>  | 0.16                                      |
| <i>GSS</i>                                     | <i>DNAJC7</i>  | 0.877       | 0.241                               | 0.769          | <b>0.02</b>   | 0.17                                      |
| <i>GSS</i>                                     | <i>HSPA1L</i>  | -0.998      | 0.048                               | 0.995          | <b>0.002</b>  | 0.08                                      |
| <i>GSS</i>                                     | <i>NUP160</i>  | 0.906       | 0.211                               | 0.822          | <b>0.01</b>   | 0.17                                      |
| <i>GSS</i>                                     | <i>RPA2</i>  | 0.872       | 0.245                               | 0.760          | <b>0.02</b>   | 0.17                                      |
| <i>GSS</i>                                     | <i>TPR</i>   | -0.887      | 0.231                               | 0.787          | <b>0.018</b>  | 0.17                                      |
| <i>GSS</i>                                     | <i>DNAJB1</i>  | 0.969       | 0.123                               | 0.939          | <b>0.001</b>  | 0.06                                      |
| Non-diabetic patients                          |  |             |                                     |                |               |   |
| <i>GCLC</i>                                    | <i>HSP90B1</i>   | 0.586       | 0.256                               | 0.343          | <b>0.045</b>  | 0.27                                      |
| <i>GCLC</i>                                    | <i>GFER</i>  | -0.756      | 0.218                               | 0.572          | <b>0.007</b>  | 0.16                                      |
| <i>GCLC</i>                                    | <i>DNAJC7</i>  | 0.595       | 0.254                               | 0.354          | <b>0.04</b>   | 0.25                                      |
| <i>GCLC</i>                                    | <i>HSBP1</i>   | 0.652       | 0.240                               | 0.425          | <b>0.02</b>   | 0.17                                      |
| <i>GCLC</i>                                    | <i>HSP90AA1</i>  | 0.663       | 0.237                               | 0.439          | <b>0.018</b>  | 0.17                                      |
| <i>GCLC</i>                                    | <i>HSPA9</i>   | 0.605       | 0.252                               | 0.366          | <b>0.037</b>  | 0.24                                      |
| <i>GCLC</i>                                    | <i>ATF4</i>  | 0.662       | 0.237                               | 0.438          | <b>0.019</b>  | 0.17                                      |
| <i>GCLC</i>                                    | <i>DDIT3</i>   | 0.668       | 0.235                               | 0.446          | <b>0.018</b>  | 0.17                                      |
| <i>GCLC</i>                                    | <i>EDEM1</i>   | 0.804       | 0.188                               | 0.646          | <b>0.0016</b> | 0.09                                      |
| <i>GCLM</i>                                    | <i>PPP1R15A</i>  | -0.585      | 0.257                               | 0.342          | <b>0.046</b>  | 0.29                                      |
| <i>GCLM</i>                                    | <i>SYVN1</i>   | -0.593      | -0.593                              | 0.352          | <b>0.04</b>   | 0.26                                      |
| <i>GCLM</i>                                    | <i>BAG1</i>  | 0.750       | 0.209                               | 0.562          | <b>0.005</b>  | 0.21                                      |
| <i>GCLM</i>                                    | <i>BAG2</i>  | -0.624      | 0.247                               | 0.389          | <b>0.03</b>   | 0.22                                      |
| <i>GCLM</i>                                    | <i>DNAJC2</i>  | -0.615      | 0.249                               | 0.378          | <b>0.03</b>   | 0.22                                      |
| <i>GCLM</i>                                    | <i>FKBP4</i>   | -0.589      | 0.255                               | 0.347          | <b>0.04</b>   | 0.26                                      |
| <i>GCLM</i>                                    | <i>HSPB1</i>   | -0.697      | 0.239                               | 0.485          | <b>0.017</b>  | 0.21                                      |
| <i>GCLM</i>                                    | <i>NUP43</i>   | 0.617       | 0.249                               | 0.380          | <b>0.03</b>   | 0.22                                      |
| <i>GCLM</i>                                    | <i>POM121</i>  | 0.706       | 0.224                               | 0.498          | <b>0.01</b>   | 0.21                                      |
| <i>GSS</i>                                     | <i>AAAS</i>  | 0.594       | 0.254                               | 0.352          | <b>0.04</b>   | 0.40                                      |
| <i>GSS</i>                                     | <i>NUP188</i>  | -0.585      | 0.257                               | 0.342          | <b>0.045</b>  | 0.41                                      |
| <i>GSS</i>                                     | <i>HERPUD1</i>   | 0.705       | 0.224                               | 0.497          | <b>0.01</b>   | 0.25                                      |

*Beta*, the regression coefficient; R<sup>2</sup>, R-squared; FDR adjusted P-value was calculated with FDR online calculator (<https://www.sdmproject.com/utilities/?show=FDR>, assessed 10.06.2023); Bold depicts statistically significant P- and Q-values.