

**Supplementary Table S3** 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 1)

Independent gene (glutathione biosynthesis)	Dependent gene (protein folding /unfolded protein response)	<i>beta</i>	Standard error of <i>beta</i>	R <sup>2</sup>	P-value	FDR adjusted P- value (Q- value)
Diabetic patients						
<i>GCLC</i>	<i>EP300</i>	-0.872	0.173	0.761	<b>0.001</b>	0.10
<i>GCLC</i>	<i>HSPA1L</i>	0.854	0.184	0.729	<b>0.0016</b>	0.10
<i>GCLC</i>	<i>MTOR</i>	-0.764	0.228	0.584	<b>0.01</b>	0.40
<i>GCLC</i>	<i>CALR</i>	0.724	0.244	0.524	<b>0.018</b>	0.54
<i>GCLC</i>	<i>DDIT3</i>	0.647	0.270	0.419	<b>0.043</b>	0.73
<i>GCLC</i>	<i>CREBRF</i>	-0.664	0.264	0.441	<b>0.036</b>	0.71
<i>GCLC</i>	<i>TM7SF4</i>	0.699	0.253	0.489	<b>0.024</b>	0.57
<i>GCLM</i>	<i>ATR</i>	-0.652	0.268	0.426	<b>0.04</b>	0.99
<i>GCLM</i>	<i>NUP153</i>	0.723	0.244	0.522	<b>0.018</b>	0.99
<i>GCLM</i>	<i>RAE1</i>	-0.697	0.254	0.485	<b>0.025</b>	0.99
<i>GSS</i>	<i>GSK3B</i>	0.653	0.268	0.427	<b>0.04</b>	0.26
<i>GSS</i>	<i>HSBP1</i>	0.691	0.256	0.477	<b>0.026</b>	0.21
<i>GSS</i>	<i>HSP90AA1</i>	0.634	0.274	0.401	<b>0.049</b>	0.29
<i>GSS</i>	<i>HSPA14</i>	-0.690	0.256	0.476	<b>0.027</b>	0.21
<i>GSS</i>	<i>NUP153</i>	-0.723	0.244	0.523	<b>0.018</b>	0.21
<i>GSS</i>	<i>NUP214</i>	0.643	0.271	0.413	<b>0.045</b>	0.28
<i>GSS</i>	<i>NUP58</i>	-0.677	0.260	0.458	<b>0.03</b>	0.22
<i>GSS</i>	<i>RANBP2</i>	-0.919	0.139	0.845	<b>0.00016</b>	<b>0.019</b>
<i>GSS</i>	<i>CRYAB</i>	0.664	0.264	0.441	<b>0.036</b>	0.25
<i>GSS</i>	<i>CTDSP2</i>	0.791	0.216	0.625	<b>0.006</b>	0.21
<i>GSS</i>	<i>ATF4</i>	0.710	0.249	0.504	<b>0.021</b>	0.21
<i>GSS</i>	<i>BID</i>	0.695	0.254	0.483	<b>0.026</b>	0.21
<i>GSS</i>	<i>CALR</i>	0.716	0.247	0.513	<b>0.019</b>	0.21
<i>GSS</i>	<i>DDIT3</i>	0.701	0.252	0.491	<b>0.02</b>	0.21
<i>GSS</i>	<i>CKAP4</i>	-0.712	0.248	0.507	<b>0.02</b>	0.21
<i>GSS</i>	<i>CREB3L2</i>	-0.771	0.225	0.595	<b>0.009</b>	0.21
<i>GSS</i>	<i>DNAJB11</i>	0.719	0.246	0.516	<b>0.019</b>	0.21
<i>GSS</i>	<i>EDEM1</i>	-0.879	0.169	0.773	<b>0.0008</b>	<b>0.047</b>
<i>GSS</i>	<i>EIF2AK3</i>	-0.752	0.233	0.566	<b>0.01</b>	0.21
<i>GSS</i>	<i>XBP1</i>	0.702	0.252	0.493	<b>0.02</b>	0.21
Non-diabetic patients						
<i>GCLM</i>	<i>BAG1</i>	0.733	0.241	0.537	<b>0.015</b>	0.13
<i>GCLM</i>	<i>BAG2</i>	0.841	0.191	0.707	<b>0.002</b>	<b>0.046</b>
<i>GCLM</i>	<i>DNAJB6</i>	0.863	0.178	0.745	<b>0.001</b>	<b>0.048</b>
<i>GCLM</i>	<i>DNAJC7</i>	0.670	0.262	0.449	<b>0.03</b>	0.18
<i>GCLM</i>	<i>HSPA14</i>	0.825	0.199	0.681	<b>0.003</b>	0.059
<i>GCLM</i>	<i>HSPA8</i>	0.821	0.202	0.674	<b>0.0036</b>	0.059
<i>GCLM</i>	<i>HSPA9</i>	0.720	0.245	0.518	<b>0.02</b>	0.15
<i>GCLM</i>	<i>NDC1</i>	0.669	0.263	0.447	<b>0.03</b>	0.18
<i>GCLM</i>	<i>NDC1</i>	0.669	0.263	0.447	<b>0.03</b>	0.18
<i>GCLM</i>	<i>NUP153</i>	0.763	0.228	0.583	<b>0.01</b>	0.09
<i>GCLM</i>	<i>NUP160</i>	0.849	0.187	0.722	<b>0.0018</b>	<b>0.047</b>
<i>GCLM</i>	<i>NUP205</i>	0.810	0.207	0.656	<b>0.004</b>	0.059
<i>GCLM</i>	<i>NUP214</i>	-0.876	0.171	0.767	<b>0.0009</b>	<b>0.048</b>
<i>GCLM</i>	<i>NUP54</i>	0.765	0.228	0.585	<b>0.0099</b>	0.09
<i>GCLM</i>	<i>NUP58</i>	0.761	0.230	0.578	<b>0.01</b>	0.09
<i>GCLM</i>	<i>POM121C</i>	0.651	0.268	0.424	<b>0.04</b>	0.20
<i>GCLM</i>	<i>PTGES3</i>	0.782	0.221	0.611	<b>0.008</b>	0.09

GCLM	SIRT1	0.783	0.220	0.613	<b>0.007</b>	0.09
GCLM	ST13	0.644	0.270	0.415	<b>0.04</b>	0.20
GCLM	EEF1A1	0.647	0.270	0.418	<b>0.04</b>	0.20
GCLM	ASNS	0.683	0.258	0.466	<b>0.029</b>	0.18
GCLM	EDEM2	-0.645	0.270	0.416	<b>0.04</b>	0.20
GCLM	EIF2S2	0.730	0.242	0.532	<b>0.016</b>	0.13
GCLM	PDIA6	0.675	0.261	0.456	<b>0.03</b>	0.18
GCLM	SSR1	0.843	0.190	0.711	<b>0.002</b>	<b>0.048</b>
GSS	BAG1	-0.771	0.225	0.595	<b>0.009</b>	0.15
GSS	BAG2	-0.703	0.251	0.494	<b>0.02</b>	0.20
GSS	BAG4	0.763	0.229	0.582	<b>0.01</b>	0.15
GSS	DNAJB6	-0.755	0.232	0.570	<b>0.01</b>	0.15
GSS	HSPA14	-0.722	0.244	0.522	<b>0.018</b>	0.20
GSS	NDC1	-0.709	0.249	0.503	<b>0.02</b>	0.20
GSS	NUP133	-0.699	0.253	0.489	<b>0.02</b>	0.20
GSS	NUP153	-0.654	0.267	0.428	<b>0.04</b>	0.28
GSS	NUP160	-0.666	0.264	0.444	<b>0.035</b>	0.26
GSS	NUP210	0.782	0.220	0.611	<b>0.007</b>	0.15
GSS	NUP214	0.637	0.273	0.405	<b>0.047</b>	0.29
GSS	NUP37	-0.686	0.257	0.471	<b>0.028</b>	0.26
GSS	NUP50	0.633	0.274	0.401	<b>0.049</b>	0.29
GSS	NUP54	-0.670	0.263	0.448	<b>0.03</b>	0.26
GSS	NUP88	-0.792	0.216	0.627	<b>0.006</b>	0.15
GSS	RANBP2	-0.780	0.221	0.608	<b>0.008</b>	0.15
GSS	RPA1	-0.641	0.271	0.411	<b>0.045</b>	0.29
GSS	ST13	-0.792	0.216	0.627	<b>0.006</b>	0.15
GSS	TPR	-0.844	0.190	0.712	<b>0.002</b>	0.15
GSS	CRYAB	-0.667	0.264	0.444	<b>0.035</b>	0.26

*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.