**G protein-coupled receptors function as logic gates for nanoparticle binding using Systems & Synthetic Biology approach**

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**E:\Papers for journals\Switching Biology 2\improved\improved\Figure 4.TIFFigure S1:** GPCR mechanism where drug bind with GPR142 and GPR119 receptor which enhance the insulin secretion using Gq dependent pathway.

**E:\Papers for journals\Switching Biology 2\improved\improved\Figure 5.TIFFigure S2:** Type 2 diabetes mechanism where investigate the drug effect on insulin secretion using Gq dependent pathway.

**Table S1.** Supplementary represents the GPR142 agonist mechanism, where Drug, DAG and PKC signalling within the GPR142 agonist mechanism signalling network and understand which patients or genes would respond to insulin and improved glucose tolerance. Graph represents the GPR142 agonist mechanism where green peak represent the insulin production, cyan peak represents the cAMP production and light green peak represents the drug amount (μM), where small amount drug was effective for improved glucose tolerance at different concentrations of glucose.

Kinetic simulations were also performed at different concentrations of glucose level, where low concentrations effective for improved glucose tolerance which increase insulin production.

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| A:\Communicated Papers\GPR142 Drug Designing Paper\Systems Biology\Glucose\0.095.jpg  Glucose effect on Insulin Production at 0.095μM | A:\Communicated Papers\GPR142 Drug Designing Paper\Systems Biology\Glucose\0.099.jpg  Glucose effect on Insulin Production at 0.099μM |

Using a Systems Biology approach identified new lead compound obtained from structure based virtual screening, which improved glucose tolerance and increase insulin production and inhibit the type 2 diabetes signalling pathway. In order to understand biological function of GPR142 in case of Type 2 diabetes. Using Kinetic simulation predict the biological behaviour of GPR142 which involved in Type 2 diabetes disease inhibition, and also predict the biochemical pathway of GPR142 in presence of drug compound where GPR142 interact with different molecules which play important role in Type 2 diabetes inhibition and improved glucose tolerance.

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**Figure S3.** Time course simulation analysis of the Type 2 Diabetes biochemical pathway where Glucose appearance in Plasma in presence of drug doses, where red colored lines indicates the Glucose Conc. X-axis represents the Time (Hour) and Y-axis represents the states.