

## **Supplementary Information**

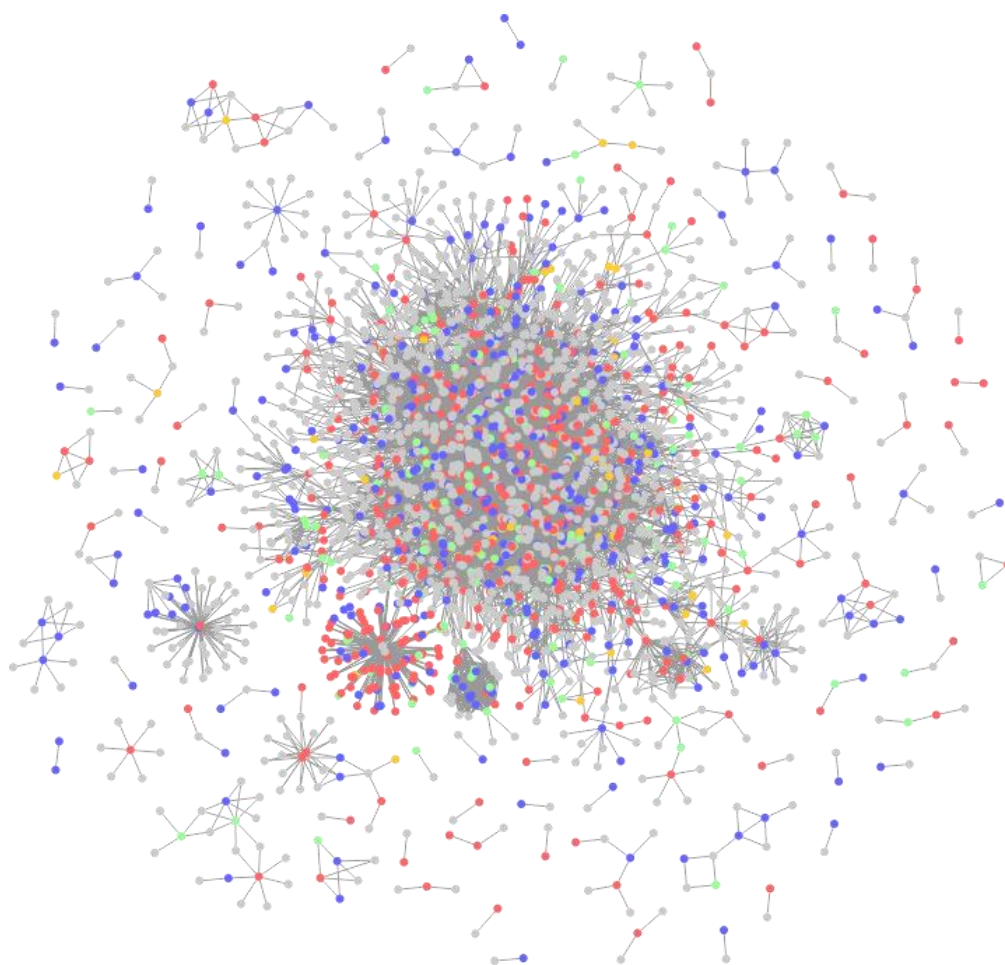
**“Dysfunctions” induced by Roux-en-Y gastric bypass surgery are concomitant with metabolic improvement independent of weight loss**

**Supplementary Fig. 1** Molecular network within genes of four transition groups

**Supplementary Fig. 2** Overview of metabolic pathways enriched by associated genes of four transition groups

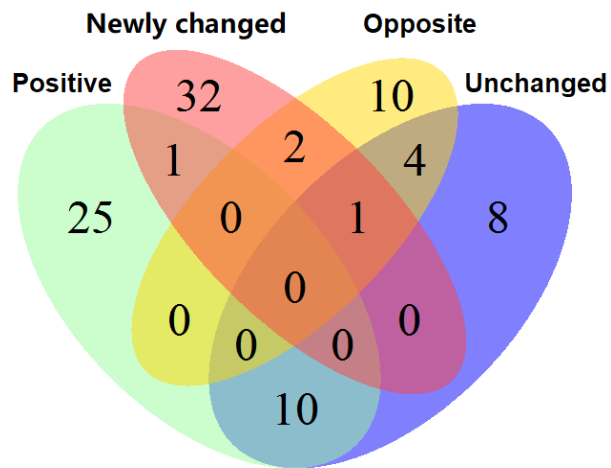
**Supplementary Fig. 3** Newly synthesized HDL-CHOL between STZ-S-30 and STZ rats

**Supplementary Fig. 4:** [<sup>14</sup>C] glucose biodistribution



**Supplementary Fig. 1. Molecular network within genes of four transition groups**

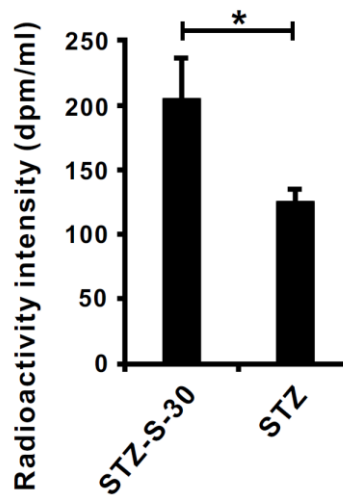
To study coordination of the unchanged genes and other groups in terms of molecular interactions and systemic functions, we constructed subnets by integrating genes of each transition group according to knowledge-based molecular interactions in rats. Significance of colors (green, blue, red, yellow) as in Fig. 3.



**Supplementary Fig. 2. Overview of metabolic pathways enriched by associated genes of four transition groups**

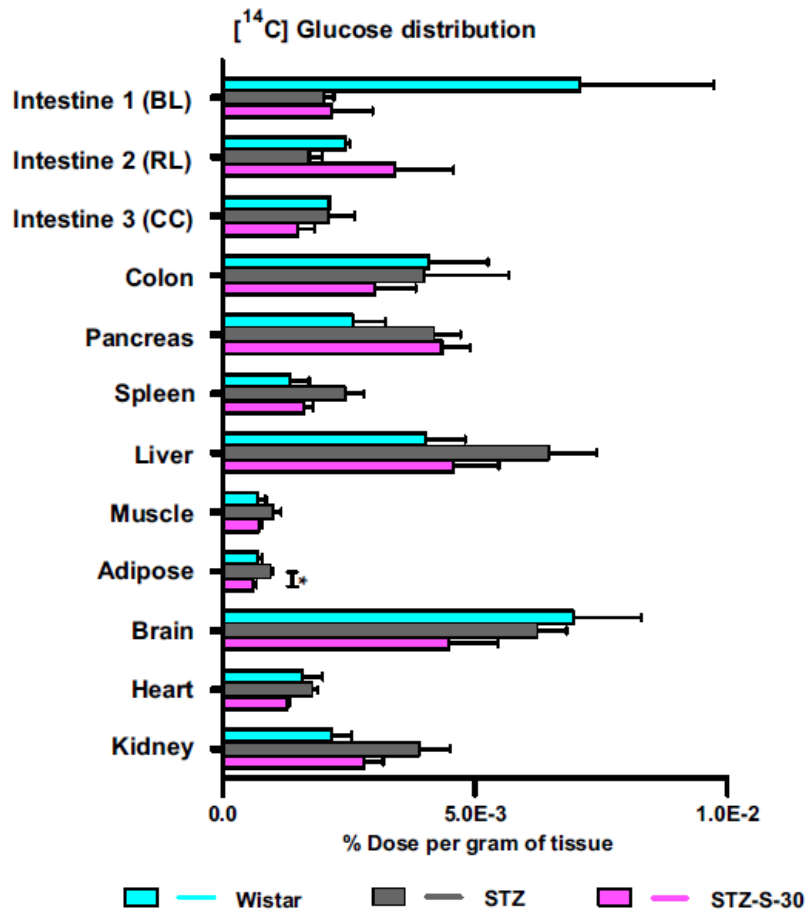
To study the functional coordination of four transition groups in terms of metabolic processes, we measured overlapping metabolic pathways not enriched by members of these transition groups.

### Newly synthesized HDL-CHOL



**Supplementary Fig. 3. Newly synthesized HDL-CHOL between STZ-S-30 and STZ rats**

To confirm that RYGB can induce increase of newly synthesized HDL-CHOL independent of total HDL-CHOL level, we measured newly synthesized plasma HDL-CHOL in STZ-S-30 and STZ groups through [<sup>14</sup>C] tracer (HDL synthesized in intestine is secreted eventually into bloodstream), and observed significant increase of newly synthesized plasma HDL-CHOL in STZ-S-30.



**Supplementary Fig. 4. [<sup>14</sup>C] glucose biodistribution**

[<sup>14</sup>C] Glucose was administered orally according to body weight. Three h later, [<sup>14</sup>C] glucose biodistribution was measured in the three groups. For each tissue type, [<sup>14</sup>C] glucose level did not differ significantly among the three groups.