

Fig S1. Trend of TEER values of Caco-2 monolayer cells with culture time (n=12). Values are the mean  $\pm$  SD.

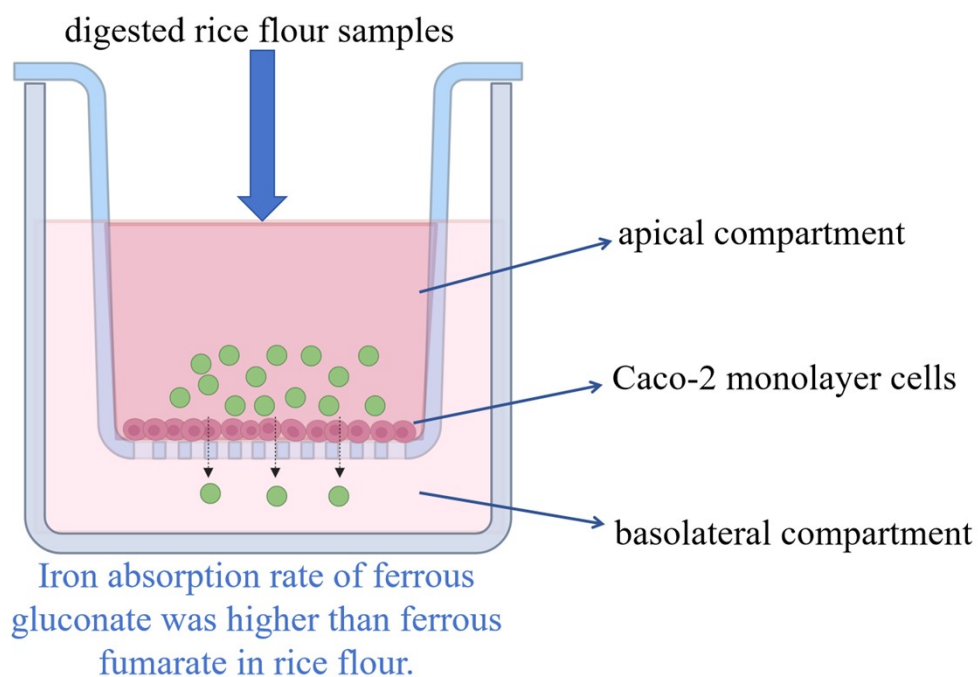


Fig S2. Diagram of Caco-2 cells transport experiments (some picture elements are from the Biorender).

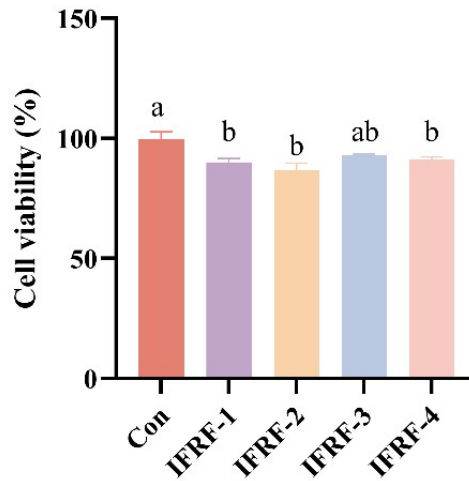


Fig S3. Effect of four IFRFs on cytotoxicity (n=4). Values are the mean  $\pm$  SD and statistical significance,  $p < 0.05$ .

There was about 10.22% reduction in cell viability of IFRF-1, IFRF-2 and IFRF-4 ( $p < 0.05$ ), with no difference in IFRF-3 ( $p > 0.05$ ). No difference was observed between IFRF-3 and the other 3 groups ( $p > 0.05$ ). The reduction in the cell viability of IFRF-1, IFRF-2 and IFRF-4 may be because the viscosity of the rice flour is relatively high compared to the control group, which can affect the normal physiological activity of cells.