

## Research Proposal

Rice (*Oryza sativa*) is one of the major staple foods in India and many Asian countries, as it is a good source of carbohydrate, vitamins and minerals. **Diabetes mellitus** is a growing public health problem and it has been linked with consumption of rice in India. The high glycemic index of rice has been the cause to increase the blood sugar level in the body and causes Type 2 diabetes. To control the accumulation of carbohydrate, the TIFY gene responsible for enhancing accumulation of carbohydrate in rice could be regulated. **Gene silencing** technology could be applied to silence the TIFY gene in rice in order to control the level of carbohydrates in the rice grains. Otherwise, **CRISPR-Cas9** technology could be applied to mutate the TIFY gene in rice and study the level of carbohydrates. **Iron deficiency** is another risk factor in 52% of pregnant women and 48% of children. Iron fortification of major staple food, rice plays an essential role in improving the health of people who consume rice predominantly. To improve the iron content of rice, the entire coding sequence of Ferritin gene from Moringa plant as it improves iron content very highly in Moringa leaves and fruits. By applying gene stacking method, both genes could be manipulated in rice which would help to reduce the carbohydrate in rice, but improving the iron content. This would result in production of rice grains with less carbohydrate but high in iron.