Chronic kidney disease (CKD) is an emerging global health problem and the cost of treatment has become an enormous burden on healthcare systems worldwide. Recent research has proved that the accumulation of uremic toxins like p-Cresol due to a failing kidney plays an important role in the acquiring of cardiovascular diseases. This year, iGEM NCKU Tainan aims to provide "Oh My Gut", a comprehensive solution to this problem, which includes CreSolve and CreSense.

**Drug — CreSolve**

CreSolve is a living therapeutic drug in the form of a capsule containing our engineered E. coli Nissle 1917 that can: (i) divert tyrosine metabolism to produce p-Coumaric acid and (ii) produce bacteriocin to target C. difficile to reduce p-Cresol accumulation in CKD patients.

**Device — CreSense**

CreSense is a user-friendly, affordable and customizable bio-sensing device. The device combines the blood separation and sensing mechanism into one compact device, hence saving space and improve usability for healthcare providers. The use of microfluidic disc simplifies the collection of the blood plasma into the reaction chamber for further sensing purposes.

**Future and improvements**

Incorporation of other secretion systems for the bacteriocin, proper selection of promoters and ribosome binding sites for TAL and tnaA gene knock out can be done. The calibration of the CreSense software will be conducted to reduce noise and error. New sensing bacteria will be constructed to increase the applicability of the bio-sensing device.

**CreSolution Biotechnologies**

This proposed spin-out company will carry on the mission of the team and conduct further R&D (pre-clinical & clinical trials) to finalize product development.

**Business plan**

CreSolve and CreSense will be marketed towards healthcare providers and distributors by emphasizing their affordability. By collaborating with national and private insurance enterprises, the accessibility of the products can be increased.

**Human Practice**

**Enterprise visit**

The advice from Winston Medical Supply Co. helped us to plan for pre- and clinical trials and understand the importance of biosafety.

**Highlight event**

The Oh My Gut Escape Room, where we engaged students of all backgrounds in breaking the code and learn about our project!

**References**


