Latin America and Caribbean Storytelling Challenge—Notable Submissions: In Varma Rambaran's Words

Committed to championing scientific innovations and advancements, Rambaran is effecting change in his community—and this year's judges of the Latin America and Caribbean Edition of the Champions of Science® Storytelling Challenge lauded his impressive efforts. Recognized as a runner-up in this year's contest, Rambaran shares his essay submission below.

Insulin Mimetic Drugs refer to the family of chemical compounds that are capable of reducing hyperglycemic levels in the body, without the involvement of insulin. The Use of Vanadyl complexes as insulin mimetics has been with us for close to a century. Unfortunately, despite its positive efficacies in in-vitro and in-vivio assays, the associated fear of using them, due to the possibility of cytotoxic and neurotoxic events, has deterred many researchers and investors from further developing this area of pharmaceutics.

The presented project, aims to dispel those aforementioned fears by presenting data, on a novel drug complex that has produced highly efficacious results. Noteworthy, there was a 0% mortality rate in subjects that were administered therapeutic doses of the drug and our initial biological screenings revealed that the treated diabetic rodents exhibited similar liver and kidney health, analogous to that of the control subjects.

Experimental:

A complexation reaction between Vanadyl Sulfate and the tridentate ligand, 2,6-pyridine diacetic acid, furnished the novel drug Complex 1. The said complex was subsequently screened for possible antidiabetic activity via an in-vivo dose-response study, using Streptozotocin (STZ) induced diabetic rodents. Adult male Wistar rats, Rattus norvegicus (2-3 months old, 170±20g), were procured and acclimated according to standard protocol (25± 2°C, 12-h dark–light cycle). Water was provided as well as a standard rodent pellet diet, ad libitum. Animals were then divided as follows: Group 1 comprised control (non-diabetic) animals, while the animals of Group 2 were made diabetic by a single dose intraperitoneal injection of STZ (50mg/kgbw); after 7 days, rats having diabetes (>180mg/dl) were selected for the further studies.

For the dose-response experiment, Complex I was administered orally at differential doses and over a period of 90 days, the following parameters were monitored daily, via the following spectrophotometric methods :

(a) daily blood glucose levels (via ACCU-CHECK© glucometer kit, Roche Diagnostics India);
(b) hepatic glycogen;
(c) blood urea nitrogen (BUN); and
(d) serum creatinine.

A dosage regime for the subjects was formulated, based on the period of time the drug was capable of suppressing their hyperglycemic state and stabilizing it at a non-diabetic level.

Results:

Data obtained by the end of the study convincingly revealed the antidiabetic activity of Complex 1, due to its effectiveness in attenuating their hyperglycemic state. Further to this, subjects that were administered therapeutic levels of the drug, displayed relatively healthy liver and kidney function in relation to that of the control subjects.

Conclusion

Over the 90 day period, the oral administration of Complex 1 (at a dose of 100mg/dl) proved most effective at reducing the blood glucose levels of the diabetic rats, from a diabetic level of >180mg/dl to a non-diabetic level of 102 mg/dl.

The content and views presented here are those of the individual Challenge participant.

About the Latin America and Caribbean Storytelling Challenge

Through the Champions of Science® Storytelling Challenge: Latin America and Caribbean Edition, Johnson & Johnson invited innovators working in the region to share their stories to help engage the public, encourage advocacy for scientific innovation and inspire youth in the region to pursue STEM careers that will help change the trajectory of health for humanity.

After receiving nearly 100 submissions between January and March 2019, an independent committee of scientists, policymakers and science journalists reviewed the applications and determined the winners.