



## Glp-1 Receptor Stimulation Preserves Neuronal Function In Rodent Models Of Stroke

**Mark S. Kindy**

Department of Pharmaceutical Sciences  
University of South Florida, USA

Recent studies suggest that the incidence of stroke is elevated in individuals with Type 2 diabetes mellitus (T2DM), signifying common mechanisms. Stroke is the second leading cause of death worldwide and is the primary cause of disability in the USA. The pathophysiology of cerebral ischemic injury is complex, and numerous studies have demonstrated that oxidative stress and inflammation are key in the underlying mechanisms. T2DM or pre-T2DM, it is speculated that insulin resistance increases stroke susceptibility. We have developed novel glucagon-like peptide-1 receptor (GLP-1R) agonists to test their efficacy in diabetic stroke mice. We hypothesize that not only would P5 and derivatives have a significant impact on the development and progression of diabetes, but would reduce the influence of stroke pathogenesis. Specifically, P5 and the brain-penetrant derivatives would appreciably attenuate stroke and provide long-term preservation of “outcomes”, resilience and sustainability. Using primary neuronal cultures and cell lines, the impact of P5 and derivatives we tested their protective role in cells treated with various concentrations in ischemia/reperfusion injury. The impact of P5 and derivatives will be tested in a mouse models of T2DM (Leprdb/db mice) and stroke. The db/db with stroke mice will be treated with various doses of P5 and derivatives to determine the impact on the

initiation and/or progression of stroke. Our data show that P5 and derivatives have a significant impact on both in vitro and in vivo stroke models by reducing cell death and infarct volume and improves long-term behavioral outcomes. In conclusion, the present data demonstrates the benefit of GLP-1R agonists for primary stroke prevention and the reduction of fatal cerebrovascular outcomes. These studies suggest that studies are warranted to evaluate the benefit of these drugs for secondary stroke prevention.

### Biography

Kindy is currently a Professor of Pharmaceutical Sciences department at the University of South Florida at Tampa. He is also a Senior Research Career Scientist in the VA. He received his Ph.D. in biochemistry at Boston University. He received a B.S. from the University of Massachusetts at Amherst. His research interest includes neuroscience and neurodegenerative diseases. He is the director of the Botanical Medicine Research and Education Consortium at USF. He is the author or coauthor of more than 230 papers in international refereed journals and more than 100 conference contributions. He has given numerous talks at international conferences.

kindym@usf.edu

### Advanced Techniques in Research:

Cholera surveillance System as the “continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice. The aggregation of quality health-related data is essential to the success of all public health initiatives. Without correct and current data, diseases are misunderstood, health programs do not accomplish their goals, and resources are not correctly allocated. Functioning surveillance systems are necessary for the success of global health initiatives. In developing countries, however, surveillance systems that collect useful and representative data are often non-existent and hard to create. The failure of surveillance systems in developing countries is often due to limited available resources, lack of knowledgeable staff, disorganization, and poor infrastructure for finding and reporting cases

### Reference Publications :

1. Sack DA, Sack RB, Nair GB, Siddique Ak. Cholera lancet 2004; 363(9404):233-233
2. Bauernfeind A, Croisier A, Fesselet JF et al. Cholera guidelines, 2nd ed. Paris: Medecins sans Frontieres; 2004
3. National Malaria Control Programme. (2013). Ghana Malaria Programme Review National Malaria, German, R. R., Lee, L. M., Horan, J. M., Milstein, R. L., Pertowski, C. A., & Waller, M. N. (2001). Updated guidelines for evaluating public health surveillance systems: recommendations from the Guidelines Working Group. MMWR. Recommendations and Reports : Morbidity and Mortality Weekly Report. Recommendations and Reports / Centers for Disease Control, 50(RR-13), 1-35-7.
4. Ali M, Nelson AR, Lopez AL, Sack D. Updated global burden of cholera in endemic countries. PLoS Negl Trop Dis. 2015;9(6):1–13. <https://doi.org/10.1371/journal.pntd.0003832>. CAS Article Google Scholar
5. Ali M, Lopez AL, Ae You Y, Eun Kim Y, Sah B, Maskery B, Clemens J. The global burden of cholera. Bull World Health Organ. 2012;90(3):209–18. <https://doi.org/10.2471/BLT.11.093427>. Article PubMed PubMed Central Google Scholar
6. World Health Organization Global Task Force on Cholera Control. Overview of ending cholera: a global road map to 2030; 2017. Available from: <http://www.who.int/cholera/publications/global-roadmap-summary.pdf?ua=1>. [Accessed 12 Mar 2018].
7. Moore S, Miwanda B, Sadjji AY, Thefenne H, Jeddi F, Rebaudet S, De Boeck H, Bidjada B, Depina JJ, Bompangue D, Abedi AA. Relationship between distinct African cholera epidemics revealed via MLVA haplotyping of 337 Vibrio cholerae isolates. PLoS neglected tropical diseases. 2015;9(6):e0003817. <https://doi.org/10.1371/journal.pntd.0003817>. CAS Article PubMed PubMed Central Google Scholar
8. Bwire G, Ali M, Sack DA, Nakinsige A, Naigaga M, Debes AK, Ngwa MC, Brooks WA, Orach CG. Identifying cholera “hotspots” in Uganda: an analysis of cholera surveillance data from 2011 to 2016. PLoS Negl Trop Dis. 2017;11(12):e0006118. <https://doi.org/10.1371/journal.pntd.0006118>. Article PubMed PubMed Central Google Scholar
9. Cholera guidelines Sack DA, Sack RB, Nair GB, Siddique Ak. Cholera lancet 2004; 363(9404):233-233