INVITED SPEAKERS

Dr. Chih-Chuan Lin is an accomplished Emergency Medicine Physician and clinical toxicologist at Chang Gung Memorial Hospital in Taiwan. He graduated from the School of Medicine at Chang Gung University and has been working at the hospital since completing his medical education. Dr. Lin has made significant contributions to the field of clinical toxicology in Taiwan, being one of the principal founders of clinical toxicology education in the Taiwan Society of Emergency Medicine. He is also a key investigator for the Taiwan Emergency Department Drug Abuse Surveillance (TEDAS) project and has established the only toxicology simulation training course in Taiwan. His research interests focus on snakebites and new psychoactive substances abuse, and he has published extensively in these areas. Dr. Lin's expertise and leadership have played a crucial role in advancing emergency medicine and toxicology practices in Taiwan.

Cytokine Changes after *Naja atra*, Protobothr*ops mucrosquamatus*, *Trimeresurus stejnegeri* Bites and Their Potential Application in Snakebites Diagnosis in Taiwan

Snakebites trigger immune responses. Several cytokines, such as IL- 1, IL-6, IL-8, and TNF-α, have been reported to be involved in human Viperidae snake envenomation. Furthermore, the activation of different cytokines has also been observed in bites of varying2024 snake species.

Taiwan habu (*Protobothrops mucrosquamatus*), green bamboo viper (*Viridovipera stejnegeri*), and Taiwan cobra (*Naja atra*) are the most prevalent venomous snakebites in Taiwan. Patients of these three snakebites share a similar clinical picture of limb swelling. Therefore, misdiagnosis of the culprit snake occurs, and currently, there are no commercially available diagnostic tools. Given the different components of snake venoms, the immune responses of the activation of various cytokines of these three snakebites are expected.

In the early stages of snakebite incidents involving these three species, heightened levels of pro-inflammatory cytokines, namely IL-6 and TNF-α, were evident. However, there was no evidence of cell-mediated immunity, a humoral immune response, or anti-inflammatory cytokines in the early stages of Green bamboo viper and Taiwan habu snakebites. In contrast, patients envenomated by the Taiwan cobra exhibited elevated IFN-γ (humoral immune response) and IL-10 (anti-inflammatory immune response) levels.

These findings underscore the divergent immune responses between the Taiwan cobra and the two hemorrhagic venomous snakes, the Taiwan habu and the Green bamboo viper, in Taiwan.