

## Role of the kupffer cell cd68, a plasmodium sporozoite receptor, in modulation of experimental cerebral malaria (ECM)

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Malaria infection of a vertebrate host starts with liver infection by *Plasmodium* sporozoites. Sporozoites move from the mosquito bite site to the liver via the blood circulation and leave the circulation by traversing Kupffer cells that line the liver blood vessels. Traversal requires interaction between the CD68 Kupffer cell receptor and the sporozoite surface-GAPDH ligand. We previously reported that a strong (~70 %) reduction occurs in the efficiency of sporozoite liver invasion in CD68 knockout (KO) mice compared to wild-type controls. We made the unexpected observation that the development of experimental cerebral malaria (ECM) in these CD68 KO mice is strongly inhibited. This inhibition only occurs when the mice are infected with sporozoites, not when infected with blood-stage parasites. Importantly, transfer of plasma from a sporozoite-infected CD68 KO mouse into a wild-type mouse induces the ECM-inhibitory phenotype in the recipient mouse. Our initial experiments found the plasma from sporozoite-infected CD68 KO mice

has a dramatically different biomarker activation profile compared to wild-type (WT) mice. We hypothesize that sporozoites traverse Kupffer cells or endothelial cells by breaching them and causing cellular injury in the absence of a CD68 receptor. We have identified soluble plasma factor(s) that are responsible for ECM inhibition in the sporozoite-infected CD68 KO mice and are determining the factors that promote their synthesis. The results may lead to novel approaches for the prevention of cerebral malaria development and malaria death.

### Speaker Biography

Sung-Jae Cha has over 20 years' experience as a research scientist in biological science field covering cell and molecular biology, genetics, immunology and molecular parasitology. His recent research has focused on the molecular biology of malaria parasite-mammalian liver cell interactions. Using phage display library screening technique he has identified the Kupffer cell CD68 and the *Plasmodium* surface GAPDH as a receptor and a ligand for malaria sporozoite liver invasion respectively.

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