

4th Glycobiology World Congress

September 17-19, 2018 | Rome, Italy

Changes in glycosylation pattern and the emerging pathology of Zika Virus

Meghan May

University of New England College of Medicine, USA

Zika virus (ZIKV) is responsible for an ongoing epidemic in the Western Hemisphere. We previously reported a systems biology analysis of ZIKV utilizing diverse strains (representing temporally diverse members of the African lineage, the Asian lineage, and the current outbreak in the Americas) to explore the natural history of this previously little-known virus. Our analysis highlighted a persistent change in the N-linked glycome of all Asian and American strains examined: glycosylation of the envelope (E) protein residue ASN₁₅₄, a modification proposed to mediate neurotropism in related *flavivirus*. This modification was absent from examined African strains. Structural analysis indicates that this residue is modified by addition of N-acetyl glucosamine (NAG) and falls within a disordered region of the E protein, suggesting that it is part of a linear epitope *in vivo*. We synthesized short (20-mer) peptides representing this region from Western Hemisphere strains (HPF2013) and African strains (MR766). A NAG-linked version of the HPF2013 peptide as well as an unglycosylated version was generated to explore the contribution of this modification to interaction with neuronal cells, Vero cells, and tissue trafficking *in vivo*. Non-glycosylated peptides from HPF2013 and MR766 blocked infection with ZIKV MR766, and glycosylated peptide blocked infection with HPF2013, implicating this motif in ZIKV-cell interactions and NAG-glycosylation with ZIKV binding of Western Hemisphere strains. Studies assessing NAG-glycosylated versus unglycosylated peptides' ability to traffic to the placenta and or across the blood brain barrier in a timed-pregnant mouse model are ongoing.

Biography

Meghan May earned her PhD from the University of Connecticut and pursued Post-doctorate at the University of Florida's Emerging Pathogens Institute. She is currently an Associate Professor at the University of New England, College of Medicine. She has authored more than 30 peer-reviewed publications and eight book chapters.

mmay3@une.edu

Notes: