Illuminating cellular and molecular mechanisms by which hypervirulent group B *Streptococcus* infects the brain

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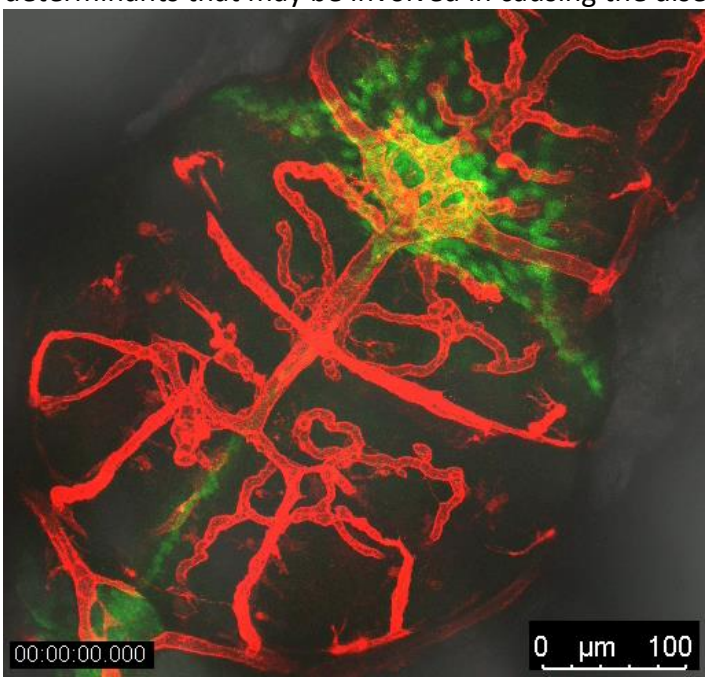
Bacterial meningitis, the most serious infection of the central nervous system, is the cause of high morbidity and mortality throughout the world, particularly in neonates. Group B *Streptococcus* (GBS) CC17 is the leading cause of neonatal meningitis in humans, yet how it causes the disease is poorly understood. The brain is protected by physiological barriers such as the blood-brain barrier (BBB) or the blood-cerebrospinal fluid barrier (BCSFB). Pathogens can cross these barriers by direct route (paracellular, transcellular) or by using phagocytic cells as a Trojan horse. We are interrogating in vivo how GBS cross the host barriers and invade the brain, their interactions with macrophages, neutrophils, endothelial cells, and what are the host and bacterial factors implicated. We are using zebrafish larvae by combining high-resolution intravital imaging with genetic manipulation of GBS virulence factors and host determinants that may be involved in causing the disease.



Cerebral vessels (red) and choroid plexus (green) of a zebrafish larva. Confocal acquisition, dorsal view of the head (Emma Colucci-Guyon).