

Alyssa C. Taylor

Shayn M. Peirce

Department of Biomedical Engineering, University of Virginia, Box 800759, Health System, Charlottesville, VA

22908

Characterization of EphB4 expression in adult mesenteric microvascular networks

The Eph receptors and their ephrin ligands play important roles in neural and vascular development during embryogenesis. Although Eph receptors and their ligands are established regulators of embryonic vascular development, their expression and function in the adult vasculature is still uncertain. In this study, we characterized the expression of the EphB4 receptor in adult rat mesenteric networks. Mesenteric tissue was harvested from 300-g, adult, male, Fisher rats and immunostained for EphB4, smooth muscle α -actin (SMA), and BSI-lectin. The expression of EphB4 was evaluated in the main feeding arterioles and draining venules of mesenteric networks (n = 33). Also, the distribution of EphB4 expression at the capillary level was evaluated for networks (n = 20) containing both a main feeding arteriole and draining venule. Our results indicated that 100% of the main feeding arterioles and draining venules examined expressed EphB4, and EphB4 expression was confined to the endothelial cells. EphB4 was expressed by 100% of the capillary sprouts examined. The intensity of the EphB4 signal was greater on capillary sprouts than on capillaries that connected arterioles to venules ($P < 0.001$). This study is the first to provide a detailed characterization of EphB4 expression throughout the adult microvascular network. Given the importance of the EphB4 receptor in embryonic angiogenesis, and our findings showing prominent EphB4 expression in capillary sprouts, EphB4 may play an important role in adult microvascular remodeling as well.