

The blood-brain barrier (BBB) prevents transport of molecules larger than 500 Dal tons from blood to brain. Receptor-mediated transcytosis (RMT) facilitates transport across the BBB of specific molecules that bind receptors on brain endothelial cells that form the BBB. An insulin-like growth factor 1 receptor (IGF 1R)-binding antibody or fragment thereof is identified that transmigrates the BBB by RMT. The antibody or fragment is used to deliver a cargo molecule across the BBB, wherein the cargo molecule may be a therapeutic or detectable agent. The antibody is a camelid VHH, prepared by immunizing a llama with a 933-amino acid IGF 1R polypeptide. Humanized forms of the camelid VHH are also generated.