[Arginine⁸]vasopressin (AVP) exerts its physiological effects through three distinct G-protein-coupled receptors (GPCRs); V₁aR, V₁bR and V₂R. V₁bR regulates the secretion of ACTH and is associated with the regulation of stress and anxiety. GPCRs share a common topology with seven transmembrane domains. The crystal structure of bovine rhodopsin also revealed the presence of a short eighth helix (H8) located in the C-terminal tail. The H8 region of the V₁bR was predicted using sequence alignments with rhodopsin and other Family A GPCRs. The function of this H8 region of the V₁bR was investigated by alanine mutagenesis. Mutant receptors were characterised pharmacologically using a combination of radioligand binding assays and intracellular signalling assays. In addition, cell-surface expression and internalisation of the mutant constructs were also studied using ELISA. The V₁aR contains a di-cysteine motif at the C-terminus of the putative helix 8 region. This acts as a palmitoylation site anchoring the receptor into the lipid membrane. The effect of perturbing the conformation of H8 was investigated and found to be important for high affinity binding of the agonists AVP and dDAVP.