The Functional Requirement of Aquaporin1a1 in Zebrafish Vascular Development

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Aquaporin1a1 is an integral membrane protein that facilitates the transportation of water molecules across a cell. Previous research showed that morpholino knockdowns showed reduced transfer rates of water, which might impact vessel lumenization (Talbot et al. 2015). Therefore, the aquaporin1a1 (aqp1a1) gene is potentially responsible for the regulation of endothelial tube formation and vascular development of zebrafish. CRISPR-Cas9 and a homology-based vector were used to generate precise integration mutants of reporter genes to help visualize the target gene mutation with amplified expression of Red Fluorescent Protein. The mutants showed vascular phenotypes in comparison to the controls and the genetic integration was confirmed to be precise by DNA sequencing, suggesting that aqp1a1 might be required for zebrafish vascular development. Further breeding and statistical analysis would be conducted to strengthen this claim.

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