## Zebrafish vimentin: molecular characterization, assembly properties and developmental expression.

## Cerda J, Conrad M, Markl J, Brand M, Herrmann H.

Division of Cell Biology, German Cancer Research Center, Heidelberg.

To provide a basis for the investigation of the intermediate filament (IF) protein vimentin in one of the most promising experimental vertebrate systems, the zebrafish (Danio rerio), we have isolated a cDNA clone of high sequence identity to and with the characteristic features of human vimentin. Using this clone we produced recombinant zebrafish vimentin and studied its assembly behaviour. Unlike other vimentins, zebrafish vimentin formed unusually thick filaments when assembled at temperatures below 21 degrees C. At 37 degrees C few filaments were observed, which often also terminated in aggregated masses, indicating that its assembly was severely disturbed at this temperature. Between 21 and 34 degrees C apparently normal IFs were generated. By viscometry, the temperature optimum of assembly was determined to be around 28 degrees C. At this temperature, zebrafish vimentin partially rescued, in mixing experiments, the temperaturedependent assembly defect of trout vimentin. Therefore it is apparently able to "instruct" the misorganized trout vimentin such that it can enter normal IFs. This feature, that assembly is best at the normal body temperature of various species, puts more weight on the assumption that vimentin is vital for some aspects of generating functional adult tissues. Remarkably, like in most other vertebrates, zebrafish vimentin appears to be an abundant factor in the lens and the retina as well as transiently, during development, in various parts of the central and peripheral nervous system. Therefore, promising cell biological investigations may now be performed with cells involved in the generation of the vertebrate eye and brain, and, in particular, the retina. Moreover, the power of genetics of the zebrafish system may be employed to investigate functional properties of vimentin in vivo.

PMID: 9860133 [PubMed - indexed for MEDLINE]