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Structural characterization of the intra- and inter-repeat copper binding modes within the N-terminal region of "prion related protein" (PrP-rel-2) of zebrafish.

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Streszczenie

The unique biology of prion proteins (PrPs) allied with the public-health risks posed by prion zoonoses, such as various animal neurodegenerations, has focused much attention on the molecular basis of the controls cross-species and on the similarities between PrPs from different species. Given the common feature of PrPs as Cu^{2+} binding proteins, it appears relevant to compare the impact of Cu^{2+} on the stability constants and structures of “physiological” complexes. After having comprehensively delineated the interaction of Cu^{2+} with mammalian and avian PrPs, the stabilities and molecular structures of species generated by Cu^{2+} interacting with the irregular repeated domain derived from *Danio rerio* zebrafish PrP-rel-2 were investigated. Copper complexes with different zebrafish PrP-rel-2 fragments were analyzed by potentiometric and spectroscopic techniques. The data were interpreted as to provide evidence of all investigated repeat units selectively binding Cu^{2+} via the His imidazole(s). The structural models obtained from paramagnetic NMR showed an intra- or inter-copper binding according to the number of the His in the sequence. In comparison to the mammalian and avian cases, the enzymatic function referred to SOD-like activity was shown to be rather faint in the fish PrPs cases.

Adres publiczny

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