



**Supplementary figure 4.** Evolutionary model describing the role of WGDs and tandem gene duplications in the diversification of vertebrate-specific globins. According to this model, tandem duplication of an ancestral, single-copy proto-globin gene in the stem lineage of vertebrates produced two linked genes, proto-globins I and II. In the first round of WGD (1R), the proto-globin I paralog gave rise to a proto *Cygb/Mb/GbE* gene (left) and a proto  $\alpha/\beta$ -Hb gene (right), whereas the Hb-linked proto globin II paralog emerged as the forerunner of the *GbY* gene. In the second round of WGD (2R), reduplication of the proto *Cygb/Mb/GbE* paralogon gave rise to *Cygb* (which was co-opted for very different functions in the ancestors cyclostomes and gnathostomes; 33) and the progenitor of the *Mb* and *GbE* genes, whereas reduplication of the ' $\alpha/\beta$ -Hb + *GbY*' paralogon gave rise to the progenitor of the  $\alpha$ - and  $\beta$ -globin gene families as well as a fourth paralogous globin gene (originally located on the '*Gb*<sup>-</sup>') that does not appear to have been retained in any extant vertebrate taxa. The chromosomal locations of the four globin-defined paralogs in the human genome are indicated at the top of the diagram.