Electronic Supplementary Material (ESI) for Metallomics. This journal is © The Royal Society of Chemistry 2019

## Supplementary data

## **Figures:**



**Figure S1:** The phase shift (solid symbols) and modulation ratio (open symbols) as a function of modulation frequency for ZnPPIX reconstituted hhMb, hNgb and hCygb. The data were fitted using either one (for hhMb) or two discrete exponential decay functions.

1	MGLSDGEWOOVLNVWGKVEADIAGHGOEVLIRLFTGHPETLEKF	44
1	MERPEPELTROSWRAVSRSPLEHGTVLEARLEADLEPLE	42
1	MEKVPGEMETERRERSEELSEAERKAVQAMWARLYANCEDVGVATLVREEVNEPSAKOYE	60
1	VDEVGGEALGRLLVVYPWTORFF	43
1	MVLSPADKTNVKAAWGKVGAHAGEYGAEALERMELSEPTTKTYE	44
1	SI SDKDKAAVRAI WSKTGKSSDATGNDAI SRMTVVYPOTKTYF	43
1	SI STKDKETVKAEWSKVSGKTEDIGNDAL SBMLVVYPOTKTYE	43
1	WVEWTDKERTTISDTESHMDYDDTGPKALSRCLTVYPWTORHE	43
	: : : : * : * : * *	
norse Mb 45	D-KFKHLKTEAEMKASEDLKKHGTVVLTALGGILKKKGHHEAELKPLAQSHATKHKI	100
human Ngb 43	QYNCRQFSSPEDCLSSPEFLDHIRKVMLVIDAAVTNVEDLSSLEEYLASLGRKHR-AVGV	101
human Cygb 61	S-QFKHMEDPLEMERSPQLRKHACRVMGALNTVVENLHDPDKVSSVLALVGKAHALKHKV	119
human Hb α 44	E-SFGDLSTPDAVMGNPKVKAHGKKVLGAFSDGLAHLDNLKGTFATLSELHCDKLHV	99
human Hb β 45	P-HF-DLSHGSAQVKGHGKKVADALTNAVAHVDDMPNALSALSDLHAHKLRV	94
T. newnesi Hb $\alpha$ 1 44	S-HWPDVTPGSPNIKAHGKKVMGGIALAVSKIDDLKTGLMELSEQHAYKLRV	94
T. newnesi Hb $\alpha 2$ 44	S-HWKELTPGSAPVRKHGMTVMKGVGDAVSKIEDLTAGLTELSELHAFTLRV	94
T. newnesi Hb β 44	S-GFGNLYNAEAIIGNANVAAHGIKVLHGLDRGMKNMDNIADAYTDLSTLHSEKLHV	99
101		45.4
101	PIKTLEFTSDATINVLRSKNPGDFGADAQGANTKALELFKNDTAAKYKELGFGG	154
102	KLSSFSTVGESLLYMLEKCLGPAFTPATRAAWSQLYGAVVQAMSRGWDGE	151
120	EPVYFRILSGVILEVVAEEFASDFPPETQRAWAKLRGLIYSHVTAAYKEVGWVQQVPNAT	179
100	DPENFRLLGNVLVCVLAHHFGREFTPPVQAAYQKVVAGVANALAHKYH	147
95	DPVNFKLLSHCLLVILAAHLPAEFIPAVHASLDKFLASVSIVLISKYR	142
95	DPSNFKILNHCILVVISTMFPKEFTPEAHVSLDKFLSGVALALAERYR	142
95	DPGNFKILSHNILVVFAIMFPNDFTPQVHVSMDKFLAALSRALSEKYR	142
100	DPDNFKLLSDCITIVLAAKMGHAFTAETQGAFQKFLAAVVSALGKQYH	147
	: <del>.</del> : . * .:: : . :	
155		154
152		151
180	TPPATLPSSGP	190
148		147
143		142
143		142
143		142
148		147

**Figure S2:** Sequence alignment of vertebrate globins. Asterisk (\*), colon (:) and period (.) denote conserved, strongly similar and weakly similar residues, respectively. Heme lining residues are highlighted in red, whereas propionate-binding residues mismatched in polarity are highlighted in green.