

Online resource 1. Complete coding sequences (collected or reconstructed) for bone morphogenetic protein (BMP) and decapentaplegic protein (DPP) used to construct the phylogenetic tree presented in Fig. 2. Dme, *Drosophila melanogaster*; Cin, *Ciona intestinalis*; Bfl, *Branchiostoma floridae*; Pma, *Petromyzon marinus*; Cmi, *Callorhinchus milii*; Ler, *Leucoraja erinacea*; Loc, *Lepisosteus oculatus*; Dre, *Danio rerio*; Ipu, *Ictalurus punctatus*; Ame, *Astyanax mexicanus*; Gac, *Gasterosteus aculeatus*; Oni, *Oreochromis niloticus*; Ola, *Oryzias latipes*; Ssa, *Salmo salar*; Tni, *Tetraodon nigroviridis*; Xma, *Xiphophorus maculatus*; Lch, *Latimeria chalumnae*; Amex, *Ambystoma mexicanum*; Eco, *Eleutherodactylus coqui*; Eco, *Xenopus tropicalis*; Aca, *Anolis carolinensis*; Gga, *Gallus gallus*; Cpb, *Chrysemys picta bellii*; Hsa, *Homo sapiens*; Mmu, *Mus musculus*

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>PmaBMP2/4a (Sea lamprey; Accession number AY602220)

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>LocBMP2 (Spotted gar; Accession number AHAT01009032)

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>LocBMP4 (Spotted gar; Accession number AHAT01019072)

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>LocBMP16 (Spotted gar; Accession number AHAT01023895)

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>DreBMP2a (Zebrafish; Accession numbers NC_007128, CABZ01062106, CAAK05040443, NM_131359, BC163036, BC163048, EH593053, EH610560, CT616046, CT616047, BM187205 and AI878481)
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>DreBMP2b (Zebrafish, Accession numbers NC_007131, CABZ01042685, NM_131360, BC114256, BC076076, D49971, DRU82232, EV759768, EV756104, CT619514, DR722644, CK400445, DR719530, CV481651, CV481676, CA588097, DV586788, CK692216, AI959065, BI889767, CK696508, EB853879, EB852282, BI889738, CT619515, FP160298, FP160299, EB835261, EB976237 and CA588098)
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>DreBMP4 (Zebrafish; Accession numbers NM_131342, D49972, DRU82231, DRU90122, DU730983, CT674533, CT619393, EB983652, CT599423, BI892288, BI886011, CK683872, CT599424, CN507552, CT619394 and NC_007128)
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TCGTTTTTAATCTCAGCAGCATCCCAGAGGACGAACTCATATCCACCGCAGAGCTTCGCGTCTACAGGCAACAAATAGAT
GACGCCTTCTCAGACCCAGATCAAACAGGGGACCATGGTTTTGCATCGGATAAACATATATGAGGTGTTGAAGGCGCCACG
GGAAGGACAGCTCATCACGCAGCTCCTGGACACACGTTTGGTGGAGGCACAACACCTCCAAATGGGAAAAGTTTTCGACGTTA
GCCCTGCAGTGTGCGCTGGACCCAAGAAAAACGCTCTAATCATGGCCTTGTGTGGAGGTTGTACAAATGAAGCGAAAC
CCAGTTCAAAGGGACGACATGTTTCGTGTAAGTCGCTCCGTGCATCCTCTTCCGGATGAAGAGTGGGACCAGCTACGCCC
CCTGCTGGTCACATTCGGACATGACGGCAAAGTCAACCGCTGACTCGGCGAGCGAAACGCAGCCCTAAACAAAGAGGTC
GAAAGCGTAATCGTAACCTGCCGGAGACATGCGCTGTATGTTGATTTTCAGGACCTAGGCTGGAACAGCACTGGATGTGGCA
CCGCTGGATATCAGGCGTATTACTGTATGAGAGGTGCTCCCTTTCCACTAGCCGATCATCTCAACTCCACCAATCACGC
TATCCTACAGACACTGGTGAACCTCGGTGAACACCAATATCCCCAAAGCCTGCTGCGTGCCCACTAGCTCAGCGCAATCT
CCATGCTTTACCTGGACGAAACGGACAGGGTGGTGTGAAAACTATCAGGAGATGGTGGTTCGAGGGGTGTGGCTGCCGC
TAA

>DreBMP16 (Zebrafish; Accession numbers NM_001171776, FN400947, CABZ01023011, CAAK05042509, FN400946, CR381630 and CAAK05042510)

ATGTTCCCTGCTAGCCTACTGGTCTGATGATCCTGCTGCTACCTCAAGCCTCATCAGGTACCAGGAGGGTCCCAGTCA
GACTCATGGAAAGCTGGACAGCCTTCTGGAGCCTAGTTTGGCCCATACCATCCAGAACCCTCTGCTAACCCGCTGGGCT
TACAGTCGCACCCCAACCCAGTACAGAGGCACAAGTTCCCCAGTATCTTCTGGACTTGTATCGATTCCACACTCAACAG
TACCATCTCATCGAGGACCCAGAATTTAGTTACCCCTCAAAGCATGTGCAAGGAGCCAACACAGTCCGATGCTTTCACCA
CACAGATTTCCGACTCCGAGTCTCCAGAAGAGCAGAAGACCACAGTGGACGGCATCCACATAGGCTTCAACCTGTCTC
CCATTCCTTCCAGAAGAAAGTGTGGTGTCCGAGAGTACGTCTACTCCATGAAGGGTCAAGTGGAGGTTCTCACGTGGCC
AGTCTTTACCTTTCCAAACCAGTACCCTTTCATCAAACCCATTCTGTCCATTACAGTCAACTGACCAGAGACAGGAAGAG
TGCCCAACTCTGGGAAACCTTTCCCTGGATAGAGAAGTGTTCAGAATTTATCCAAGACGTCAGGAAGCCTGTCTTTTA
TCCTGGATGTTATTCCTGATAATAACAGCAGCAGTACTCTTCTAAAGACAGACATTTGCGAGTACGCAGATCCACATTG
CAGGACGGGCCTACTTGGGAAAGGCAAAGGCCTTTATTAGTGACCTACAGTACAGTACGATGGCCGAGCAGCCTTTTGTGAA
TCTCAATAAGCGTAAAAGCAGCCGAAGCAGGAGCAGATGGACCAGGTTAAGGGTGATAGGGGTGAGGGCTCTGACTGGA
ATGAAAGGCGAGTAAAACGAAACAACAGGAGGGCCGAAAACCTCAAAGACTCTCCCGCGCTCGTTGTGTCGCGCACCCG
CTGTACGTGGACTTCAAAGATGTGGCTGGAATAAATGGATCATAGCTCCATCTGGTTACGATGCTTTCTTTTGCCTCGG
AGAGTGGCGCTTCCCAGTGGCTGACCATATGAATTCATCAAGCCATGCCATGGTGCAGACGCTAGTCAGCTCTGTAAACG
GAGCCGTGCCGCGACCATGCTGCGTCCCTACAGCTCTCAGCCCAATCGCTCTACTCTTTCTGGACCAGGAGGAACGTGTG
GTGTTGAAAACCTACCAAGACATGGTGGTGGAGGGATGTGGCTGTGCATAG

>IpuBMP2a (Channel catfish; Accession numbers JT279003, JT446579, JT413282 and
JT376107)

ATGGTGGCCGGTGTTCGCTTTGCTCATCGCGCAGCTCTTCTTCGGAGGCTGCACGGGTCTCCTGCCGGAGATCGGGCGCCG
CAAGAACAGCCCTCACCTCTCCAGGACGCGCTGGACGCTTTCGAGCTTCGTCTGCTCACCATGTTTCGGACTGAAGCAGA
GGCCGAGTCCGAGCAAATCAGCAGTGGTCCCGCAGTACATGCTGGATCTGTTCCACCAGTATTACGCCAACAGTGGCCGAG
CAAAGCACCAGAAAAGCAGAGCAGTGGCCAGGAGCGCAGCAGATCCGCTAGTCCGGCGAACACAGTACGAAGCTT
CCATCATGATGAATCTACAGAGGAGCTGTCAGCTCAGTGGAAAGACGACTCAAAGGTTCTCTTTAATATGAGTCCCA
TCCCAGGAGAGGAGTGTGTCACATCAGCAGAGCTGAGGATTTACAGGGAGCAGGTGATGACGAACAGTACGCAACAGC
AGTGGCGGGTACCATCGCATTAACATCCACGAGATCATCAAGCCTGCACTTCCGTTTAAAGAGCCCATCACAAGACTTCT
AGACACCAGACTGGTTCAGCACAGCCTGAGCAAGTGGGAAAGCTTTGATGTGAGTCTGCTGTCTTGGCGTGGACCAGGG
AGAGTACACCAACCATGGCTTTGTGGTGGAGGTGGTTCACCCAGGCGATGCAGAAGGAGACTACAAGAGACATGTCAGA
GTCAGTAGGTCGCTGCATGACAGCACAACCTCATGGCCTCAGATGAGGCCACTGCTGGTGACGTTTACGCCACGACGGCAA
AGGACACGTGCTCCACTCTAGGAAGAAACGGCAAGCGCGAGTCAACAAGCCAAAGAAGAAACACAAGCCAACTGCAGGA
GGCACTCGCTCTATGTGGACTTACGCGACGTGGGCTGGAATGACTGGATAGTGGCACCACCAGGCTACCATGCCTTTTAC
TGCCAAGGAGAGTGTCTTTCCCTTTGGCAGACCACCTAAACTCCACTAACCATGCCATTGTACAGACACTGGTCAACTC
GGTGAATAGTAACATTTCCCAAGGCATGCTGTGTGCCACAGACCTGAGCCCCATTTCCCTGCTCTATTTAGATGAGTATG
AGCGAGTGATCCTGAAAACCTACCAGGACATGGTGGTGGAAAGGCTGTGGGTGCCGCTGA

>AmeBMP2b (Mexican tetra; Accession number DQ915172)

ATGGTGGCCGCGGTGCGCTCCGTCACGGCGCTGCTGCTGCTCGCTCAGGTGCTGCTGGGAGGCGTTGCCGCCGCGCTCGT
GCCCGACGTGGAGCGGCGCAGGCCCGGAGAGCAGAGCTCGAGCTTCTTGCAGGAGTTCGAGCTGCGCCTGCTCAACATGT
TCGGCCTGAAGCGCAGACCCACGCCAGCGGCGCCGCGCTCGTCCCCGACTACATGCTCGAGCTTACCACCTGCACGCG
GGGGTGACGGAGGAGCGCAGCAGCAGCCTTACGAGGGCGCGCGGAGGAGGCGCGGACAGGCGGCGCCAGCCGCGGCG
CAACACCATCAGGAGCTTCCATCAGAAAGAAAGCTTTTGGAGCCCTCTCCAGCCTGAAAGGAAAGACAACACAGCAGTTCT
ACTTCAACCTCACCTCAGTGCCAGCAGAGGAGCTAATCACAGCCGCGGAGCTGCGCRTCTTACAGAGACCAAGTTCTAGGT
GACTTTTACAAAGAGCAACAGCAGTGTGTCAGGTGGTTTTTACCAGCATAAACATTTTTYAGGTGTTTACAGCCAGCTCATTC
CCTATCAGAGGAGCCTCTACCAGGCTGGTGGATACTCGTCTGGTGCAGGACTCTCATTGCGGGTGGGAGAGCTTCGATG
TGGGCTCAGCAGTGGCGCGCTGGACCGCACACTCGCACCACAATCATGGCCTCCTGGTGGAGGTGCTTTCATCCTGAGGAG
AGCAGTGGAGAGGAGCAGGCCGAGAGGAACAGGAGGAGGCAGTAAGGGTGGAGCCGTTCCCTGCACGCGGACGAGGACTC
TTGGTTCGAGGCCCGGCGCTGCTGGTTACTTACAGCCACGATGGTAAGGGTACGCCCTCCTGCAGCCACACAGAGAGA
AACGGCAGGCGCGGCGTGGGCCAAGCAGCGGCGGAAACCACACCAGCGCACCAACTGCCGCCGGCACCCGCTTTACGTG
GACTTACGCGACGTGGGATGGAATGAGTGGATCGTGGCTCCGCTGGCTACCATGCCTTCTACTGCAACGGCGAGTGCCC
CTTTCCGCTTTCTGACCACCTCAACTCCACAACACAGCCATAGTCCAGACTTTGGTGAAGTTCGGTAAACTCCAACATTC
CTCGGGCTTGCTGCGTGGCCACAGAACTCAGCCCCATCTCTGCTCTACCTGGATGAGTATGAAAAGGTTGACTGAAA
AACTATCAGGACATGGTTGTAGAGGGCTGCGGTTGCCGGTGA

>IpuBMP4 (Channel catfish; Accession numbers JT406104 and FI862280)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTATTATGCCAAGTTGTACTGGGAGAGAGCAGCCATGCTAGTCTAAT
ACCCGAGGAAGGGAAGAAAAGGCACTGGGTAATAACCCAGGTCAAAGTCACTGAAGTGTGCGGGACTTTGAGGCCACGC
TGCTGCACATGTTCCGGCTGCAGAGGCGGCCACGGCCACGGCTTGGCAGTGGTGCAGTATCTGCTCGACCTCTAT
AGCTGCAGTCAAGGAAAGTGGAAAGAGGCTGAAGTCAAGTGTGAGTCTTGAATATCTGAGAAGTCCACTACCGGAGC
CAACACTGTGAGAGCATTCATCATGAAGAGCAGTGGAGCAAGTCCGCTCAGACAGACCCGTACAGCATCGAGACTCCTC
TGCGTCTTTCTTTAACCTCAGCGGCATCCCTGAGGATGAGCTGCTTTCCACGGCAGAACTGCGGCTGTACCGGAAGCAG
ATTGAGGAGCCTGGTTTGGAGTCCCAGCATGTGGGAAATGAGGACCTCCATAGGATCAATGTGTATGAGGTGCTGAAGCC
ACCACAGCCCAGGACGCTGATCACACGCCTCCTGGACACACGCCTTGTAGCCACAACACCACCAGCTGGGAAAGCTTTG
ACGTGAGCCCGGCTGTATTGCGTTGGACCCACGAGCGGTTACCAAATATGGACTTGTGTAGAGGTTCTGCATCTGAAC
CAAACACCGCGGCACCAAGGCAAGCAGTGCAGCATCAGCCGCTCACTGCACCACACTTCAAGAAAACCTGGGACCAGCT

GCGTCCTTTGTTGGTCACTTTTCGGCCATGATGGCAAAGGCCACCCACTGACACGTAGGACCAAACGCAGCCCCAAGCAGC
GAGGCCGTAAGCGCAACCGCAACTGCCGGCGACATGCGCTGTATGTGGACTTTAGTGACGTAGGCTGGAATGACTGGATA
GTGGCACCACCGGGCTATCAGGCCTATTACTGCCACGGGGACTGCCCTTTCCCTCTAGCAGACCATCTGAATTCCACGAA
CCATGCTATTGTACAAACACTGGTCAACTCGTTGAACAGCAATATTTCCCAAGGCCTGCTGTGTGCCACCGAGCTGAGTG
CCATCTCAATGCTCTACCTGGATGAGACTGACAGAGTAGTCTTGA AAAACTACCAGGAAATGGTGGTGGAGGGCTGTGGC
TGCCGCTAG

>IpuBMP16 (Channel catfish; Accession numbers JT415761, JT155730, JT424125 and JT148139)

ATGTTTCCTTGCTAGTCTTCTAGTTCTGATGACCCTGCTGCTTCCCTCCAGCCTTGTGAGCTCAACAGGTGGATTCCAGTCA
CTCTGATGGGAACCCAGGAATCTCTCTCGAGCCCAGTTTGGCCCAGACCATCCAGAACCTCCTCTTGACCCGACTGGGCC
TACAGTCTATCCAAACCCCTCACCCAGGAGCAGTGGTACCTCAGTATCTCCTGGACCTCTATCGCTTCCACACACAGCAG
TACCACCTAGTAGAAGATCCAGATTTTCAGCTTTTCTGTGGAGCATGTAGAAGGTGCCAACACTGTTTCGCAGCTTCCACCA
TGCAGTGTCTTTCAGACCTTTCACATCCCTGATGAGAAGAGTGACAGGATCCATATAGCTTTTAACTGTCTCTATTCCCTT
CCTACGAGAATGTGGTCTCAGCAGAGCTGCGTTTTCTGCGTGGAGGAACACGCTGGGGTTTCAGAGCCTCACACTGTCAGC
CTCTATGTCTCTGGTGGAAACATTGAGCCAACACTTCTCCATTACAGACAGTTAGTTAGAGAGCCCTCAGGGTCTTGGGA
GGCCTTTCCCTCTGAACGCAAAACTGTTTTCAGAAGTTGTCTGATAGTGCAGGGAAAGTGGCCTTTATCTTGGAAAGTGACCT
CAGATAACAGCAGTACGCTGTGGAGGACATGGACACAGAGGGACACTTGAGAGTGCCTAGGTCTGCAGGTGAAGATGAC
TACAGCTGGGCACGCCAAAGACCCTACTGGTCACTTACAGCCATGATGGGCGCAGTGAACCATTTCATTTCCCTTTGGAAA
GAAGAAGACCCCCAGGGGTAGGAGGGGGCGGTAACAAGGCTAAAAGCTCAAAGGTGAGGGCTCACAGGTAAGCTGGCGTG
ATGTGTGGACAGACAAGCGGGTAAAGAGGAATAACGGCGGTGAGCAGCCAAGCTGAAACGCCTGTCTCGCTCTCGATGC
CGCCGCCATCCCCCTACGTGGACTTCAAAGATGTGGGTGGAACAAATGGATCGTTGCACCCGACTGGTTACGACGCCTT
CTTCTGTCTGGGTGAGTGGCGCTTTCCCTCTCGCCGACCACATGAACTCGTCCAGCCACGCCATGGTGCAGACACTGCTGA
ACTCGTTAATGGAGCCGTGCCACGAGCCTGCTGTGTGCCTACGGCCCTCAGTCCAATCGCGCTCCTTTATCTGGACCAG
GAAGATCATGTGGTTCTGAAAACTATCAGGATATGGTAGTGGAGGGCTGCGGCTGCCGGTAG

>GacBMP2 (Three-spined stickleback; Accession numbers DW637392, DW637393 and AANH01008393)

ATGGTCGCCGTGGTCCGCTCTTTCATGGTACTGCTGATCGCTCAGGTGTTGCTGGAAGGTGCTACGGGACTCATCCCCGA
GGTCGGCCGGAGGAAATACAGCGAGTCCGGGAAGCAGACCCCCGAGCGGTGCGAGAGCTTCCCTCCACGAGTTCGAGCTCC
GGCTTCTCAACATGTTTCGGACTGAGGCGCAGGCCGACCCCCGAGCAGGCAAGCCGTGGTGCAGCAGTACATGGTGGATCTT
TACCGCATGCACTCAGCGAACGGAGACCACAGCGCCAAACGACCCAAGAGCATGGGGAGGCACGCAGAGAGGGCTGCGAG
CAAGGCCAACACGATTAGAAGCTTTCACCACGAAGAGTCCATGGAGGCCCTGGCCCCGGCTGAAGGGTAAAACAACCCAGC
AGTTCTACTTCAACCTCACTTTCGATCCCCGAGGAGGAGCTCATACCTCCGCAGAGCTCCGCGTCTACAGGGACCAGGTC
ATGGGAGCCGCGGCCCCCGACAACAGCGCCGGGAACAGCAGCACTAGTGTGACGCGCCGGCGGGTGGCTTCCATCGCAT
CAACATTTATGAGATATTTGGAGTTCCTCCGCCAAGGTGGGGAGCCCCCTGGCGCGTCTGCTGGACACTCGGCTAGTGC
GGGACTCTTTGAGCCGCTGGGAGAGCTTCGACGTCAGCCCCGCGTGTCTCAGTGGACCGCCGGGAAAGGTGCGAACCAT
GGCTTCATGGTGGAGGTGCATCACCCAGAGGAGGGGGCGACGGACGGGGAGCACGCCAGAGACGCAGGCAGGCACGTCAG
GGTGAGCCGGTCCCTGCACCAGGACCGGGACTCGTGGCCTCAGGCTCGGCCTCTGCTGGTGCAGTACGGTTCAGACGGCC
CGGGGACTCGGTGCTCCACAGCGGGAAAAGCAGCGCCAGGCGGCTCCGCAAAACAGCGCAGGAAGCACCAGCAAGGCC
AGTCGCAAGAGCAGCCCTGTACGTGGACTTCAGCGACGTGGGGTGGAAACGAGTGGATAGTGGCGCCCGCCGCTACCA
CGCTTTTACTGCCAGGGGAGTGTCCGTTCCCTTGGCGGAGCATCTCAATTCCACCAATCACGCCATCGTGCAGACGC
TGGTCAACTCGGTCAACTCGAACATCCCCAGAGCCTGCTGCGTGCCCACTGACCTCAGCCCCATCTCCCTGCTCTACCTG
GACGAGTACGAGAAGGTATCTGAAAACTACCAGGACATGGTGGTGGAGGGGTGCGGCTGCCGGTGA

>GacBMP4 (Three-spined stickleback; Accession numbers DT969085 and AANH01003910)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTAATATGCCAAGTCTGCTGGGAGAGAGCAACCATGCCAGTCTGAT
ACCTGAAGAAGGGAAAAAGAAAGTACCGGGCTGCAGGGTCTGTTCCGGCCTCTCAGAGCCATGAACTGCTGCGGGACTTTG
AGGCCACGCTGCTGCACATGTTTGGCCTCAAGAAGCGGCCGCGGCCAGCCGATCGGCCTCGGTGCCTCGGTACCTGCTG
GACCTCTATCGGCTGCAGTCAAGGGGAGGCGGAGGAGCCGGGGTGCACGACATCGCTTTTCAGAGTACCCGAGAGGTCAGC
CAGCCGGGCCAACACTGTGAGGGGCTTCCACCACGAGGAGCAGATGGAGCGGGTGCACAATCTGGACGATGGAGAAACCG
CCCCCTTCGCTTCCGTGTTCAACCTCAGCAGCATCCCGGAGGACGAGCTGCTCTCTTTCAGCCGAGCTCAGGCTCTACCCG
CATCAGATCGACGAGGCCATCGGCGGCGCCTCGTCAGACAACCAGGGGCTTACC CGGATAAATGTGTACGAGGTGCTGAA
GCCCCCCCCGGCCGGCCAGCTCATCACGCAGCTCTTGGACACGCGGCTCGTGCAGCACAAACGCGTGCAGCTGGGAGAGCT
TCGATGTGAGCCCGGGTGTGCGCTGGACTCGCGAGAGCCTCCCGAACCACGGGCTGGTGGTGGAGGTCTGCACCTC
AACCAGACGCCGCGCCACCAGGGCCGGCACGTCCGCTCAGCCGCTCGCTGCACCGGGAGCCCGGCGAGGACTGGGAGCA
GCTACGTCCCCCTCTGGTTACCTTTGGCCACGACGGGAAAGGTACCCGCTGACCCGTCCGACCTGAGGCTGAACTGACTGG
AGCGGGCCGCAACCGCAACCTGCCCGCCGACGCTATATGTGACTTCAGCAGTTCAGCAGTTCAGGCTGAACTGACTGG
ATAGTGGCGCCCCCTGGTTACCAGGCCATTACTGCCACGGGGAATGTCCCTTTCTCTGGCGGATCATCTGAACTCAAC
CAACCATGCCATTGTTTCAGACGCTGGTGAACCTGTGAAACAACAACATTTCCCAAGGCCTGCTGCGTGCCACAGAGCTCA
GCGCCATCTCCATGCTCTACCTAGACGAACACGACAAGGTGGTCTCAAAACTACCAGGAAATGGTAGTGGAGGGCTGC
GGTGCCTGTA

>GacBMP16 (Three-spined stickleback; Accession numbers DT979515 and AANH01003009)

ATGTTCCCTGCTAACCTCCTGCTCCTCATGGTCCTGCTCCTACCTCAAGCCTCGTCTGGTCGCCAGGGTGGAGTCACCAG
CAAGACCGACCATGGCCGGGTGTCTCCATGCCTTCCTCCTTGTGCGCCCCACCAGCTGGTTCCTCCTCCTGGAGCCCA
GTCTGGCACAGACCATCCAGAACCTCCTCTTGAGCCGCCTGGGCCTACAGTCGCAGCCCGACCTCGGCCTGGAGTGCCG
GTGCTGGGTACCTCCTTAATCTTTACCCTCCACCAGCAGCAGTACCATCTAGTGGAGGATCCCTCGTTTTAGCTTCCC
GAGCCAGCACATGAGCAGGCCAACACTGTACGCAGCTTCCACCACAATGAGCCCCCTCGGAGGCAATCCTGTAGCAGTGG
ATCGTAAGAGGGTGCACATCTCCTTCAATGTATCCTCCATCCCTCAGGATGAGAGGGTGTCTCCTCGCTGAGCTTCGGCTT
CTCCGAGTGACAGAGCTTACCTAGGTCCAGAGCTTCCACAGACTTAACCTTATACCTCACTAAGCACCATGAGGACCCTGA
GCCCACCTGCTGGAGACAAGGTTACTCACCCTGGCCTCCACGGTCATAAAGAAGGCGGCTTCTGGGAGGCTTTTAGCT
TAAATGCAGAGTTCCTCCATGAGGCCCTTAGTGGGACTGGCAGTCTGGGCTTCCTCCTAGAGGTCGGAATTGAGAACAGC
ACCACATTGATCCCTGAACAAAACCTCTACCCTGCCGAGCTGAGGAGGAGACAGAGAAAACACAAAACAGGGACACCTGAG
GGTATGCAGGTCTGTGGGTGAGGACGAGCATAGCTGGGCCAGGAGAGACCCCTCTTGGTGACGTACAGCCATGACGGCC
GTGGAGAGCCCTTGGTCAAACATGGCAGGAGGAACCCCAACGGAGGCCAGAGGGTGAGAGGGGAGAAAAGGGACCAAAGAC
AGGACCAGGGGCAGCAGCAATAGCCGAGTAGAGACCCGGCTTCGGGCAGGGCCAAAAAACAGGGTATACAGTGCAGGG
CAGGGGGAGTGTAAAAGAGGAGTCACTGGAGCGATGCCGGAAGGGTGAAAAGAAACGGCGGTCTGTGCTGCAAACTGA
AGCGCCTTCTCGTAACAGATGTGCGCCGATCCTCTCTATGTAGACTTCAACGATGTGGGGTGGCACAAGTGGATCATT
GCACCAAGCGGCTACGACGCCTTCTTCTGCTTGGGCGAGTGTGCTTTCCTCTGGCCGACCACATGAACTCCTCCAGCCA
CGCCATGGTGAAACTCTGGTGAACCTCGGTGAATGGAGCTGTGCCGCGGGCCTGCTGCGTCCCCACCTCCCTCAGTCCCA
TCGCCCTGCTCTACCTAGACCCTCAAGACCGAGTGGTGTGAAGAACTACCAGGACATGGTGGTGGAAAGGCTGCGGCTGC
CGGTAG

>OniBMP2 (Nile tilapia; Accession number AERX01005559)

ATGGTCGCCGTGGTCCGCTCTCTCATGGTACTGCTGCTCGCTCAGGTGTTGCTGGAAGGTGCTACGGGACTTATCCCCGA
GGTCGGCCGGGAAATACAGCAATCCGGGAAGCAGACCCAGAGCAGTCAGAGAGCTTCTCAACGACTTTGAGCTTC
GGCTTCTCAATGTGTTTTGGACTGGGGCAGGCCGACCCCGAGTAAGCAAGCCGTGGTGGCCGAGTATATGGTGGACCTT
TACCGTATGCATTTCAGCAAACGGAGACCATAGCACAAACGACCCAAGAGCATGGGGAAACACGCAGAGAGAGCCGCCAG
CAAGGCCAACAGATTAGAAGCTTTCACCATGAAGAGTCTATGGAGGCCCTGGCCAGCCTAAAAGGCCAAAACGACACAGC
AGTTCCTACTTTAATCTCACTTCTATTCCAAATGAGGAACTCATCACCTCTGCAGAGCTACGCATTTACAGGGATCAGGTC
ATGGGATCTGCAAGCCCCACCGAAAGCAGCATTAGTGACAGTACTCCTGCTAGTGGCCTCCATCGTATCAACATTTATGA
GATATTTGGAGTTCCTGCCACTCAGGGCAAGGAACCTCTACTACGTCTGCTGGACACTCGAATGGTGCAGGACTCTTTGA
GTCGCTGGGAAAGCTTTGACGTCACTCCGCTATATCTCATTGGACCTCTGGGAATGGCCACAATCACGGCTTCTTGGTG
GAGGTGATTCACCCAGAGGAGGGGGAGATGGACAGCAAGGACGCCACAGACGCAGGAGACATGTCAGGGTGAGCCGGTC
GCTACACCAGGACCAGGACTCGTGGCCTCAGGCTCGACCGCTGCTTGTGACATATGGCCACGACAGCCGCGGGGGCTCAG
TGCTCCACAAACGGGAAAAAAGGCAAGCAGCACCCCGCAAACAACGTAGGAAGCACCAGCACAAGGCAAGCTGCAAGAGG
CATGCCTTGTACGTGGACTTCAGTGATGTGGGCTGGAATGAGTGGATAGTGGCACCCCTGGCTACCATGCCTTTTATTG
CCATGGGGAATGTCTTTCCCCCTAGCAGACCACCTCAATTCTACTAACCACGCCATTGTGCAGACACTTGTCAACTCAG
TCAACTCCAACATCCCCAGAGCCTGTTGTGTGCCACTGACCTCAGCCCCATTTCTTTGCTCTACCTGGACGAATTTGAG
AAAGTAATCTGAAAACTACCAAGACATGGTGGTGGAGGGATGCGGCTGCCGGTGA

>OniBMP4 (Nile tilapia; Accession numbers AB084664 AERX01008958 AB084664 and GR604846)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTAATATGCCAAGTCCTGCTGGGAGAGAGCAACCATGCTAGTCTGAT
ACCTGAAGAAGGAAAAAAGAAAGTACCTGGCCTGCAGGGTCGTTTCGGCCGCTCAAAGCCATGAACTGTTGCGGGACTTTG
AGGCCACGCTGCTGCATATGTTTCGGCCTCAAAGGCGGCCGCGGCCAGTCGTTTCAGCCACTGTGCCCCGCTACCTGCTG
GACCTTTTATCGGCTACAGTCGGGCGAGGCTGAGGAGGCGGAGCGCACGACATTGCTTTTTGAGTACCCAGAGAGGTCAGC
CAGTCGGGCCAACACTGTGAGGGGCTTCCACCATGAAGAGCAGTGGAGCAGCTACATGAGCTGGATGACGGAGGACCCA
TGCCCATTCGTTTTATGTTTAACCTCAGCAGCATCCAGAGGACGAGCTTCTGTCTTCCGAGAAGTGGGCTCTACCGT
CATCAGATTGATGAGGCCATCGCTGACGCCATCTCACACGACCAGGGGCTTACCAGAATAAACGTGTACGAGGTGCTCAA
AGCCCCCGACCTGGGCAGCTTATCACGCAGCTTCTGGATACGCGGCTAGTGCGCCACAACGCATCGCGCTGGGAGAGCT
TCGACGTCAGCCCCGCGTGTGCGCTGGACTCGTGAGCGCTTCCCAATTACGGGCTGGCTGTGGAGGTTCTGCACCTC
AACCAGACTCCACGTCACCAGGGCCGACACGTTTCGCATAAGCCGCTCGCTGCACCAAGAGCCCGGTGAAGACTGGGAGCA
GCTACGCCCCCTCCTGGTAACCTTTGGTACGACGGAAGGGTACCCTGACTCGCCGGACCAAGCGCAGCCCGAGAC
AGCGGGGCGGTAAACGCAACCGCAACTGCCGGCGCCATGCGCTGTACGTGGACTTCAGCGATGTAGGCTGGAATGACTGG
ATAGTGGCGCCTCCTGGTTACCAGGCCTATTACTGCCACGGGGAATGCCCTTTCTCTGGCAGATCATCTGAATTTAAC
CAACCACGCCATTGTTTCAGACACTGGTGAACCTCTGTGAACAACAATATTTCCCAAGGCCTGCTGTGTGCCAACAGAGCTCA
GCGCCATCTCCATGCTCTACCTAGATGAACACGACAAGGTGGTCTAAAAAACTACCAGGAAATGGTAGTGGAGGGCTGC
GGCTGCCGCTAA

>OniBMP16 (Nile tilapia; Accession number AERX01025009)

ATGTTCCCTCCTAACCTCCTGCTCCTCATGGTCCTGCTGCTACCTCATGGCTCGTCTGGTCGCCAGGGTGGAGACACCAG
CGAGATCGATCATGGCAGGGTGCACCCACACCTTCCGCTTTGTACCCTCACTCCGGGATCCCGGTCTGGCTCAGACCA
TCCAGAGTCTCCTTTTGGAGCCGACTGGGGCTGCAGTCTCAGCCTGACCCAAGGCCTGGAGTGCCGGTGCCACGGTACCTC
CTGGATCTTTACCCTTCCACCAGCAGCAGTACCATCTAGTAGAGGACCCCTTCATTTAGTTTTCCCAGTCAGCACATCCA
GGAGGCCAACACTATACGCAGCTTCCACCACAATGAGCCCCCTGGAGACAGTCTTGGTGCAGAGGATCATAACCAGAGTGC
ACATTTCTTCAATATCTCTTCCATCCCTCAAGATGAGAGTGTGCTCTCTGCTGAGCTCCGCCTCCGTGCGAGTGACGGA

GCATCTCTGGGTCTGGACCCACAGACTAAACCTATACCTCTCTGAGCACCATGAGGACCCTGAGCCCACTCTGCTGGA
AACAAAGTTACTCACCAATGGCCTCCGTAGTTATAAAACAAGTGGTTTTCTGGGAGGCTTTTAGTCTTAGCGCAGAACTCC
TACATGAGGCCCATGCTGGGACTGGCAGCCTAGGATTCTCTCTGGAGGTGACACCTGAAAACACCACCTCACTTCTGAG
CAGAACCTCTCTTCTGCTGCAAGTGAGGGGACGGAGAAATCAAAAGAGGCACACCTGAGGGTGTGCAGATCTGTGGGACA
AGACGATCACAGCTGGGCCAAGAGAGACCCCTCTTGGTTACTTACAGTCATGATGGTCGTGGACAGCCTTTAGTCAAAC
ATGGTAGAAGAAACCTGGTAAATGGCCAGAGGAAAAGGAGCAAAAGGCAAGGGTCAAGAATAAAAACAAGGAATCTCAAT
AGAAACCAATCTGGGGGAGGACAAAAGAATGGGGTATACTGTGACCCAGCTGGGCGGATGACAAAAGGAAATCAGTTG
GAGCGAACGTGGCAGGGTAAAAGAAACGGTGGTCGTTCTGCAAACTGAAACGCCTTTCCCGCAATAGATGCCGCCGCC
ATCCACTTTTATGTAGATTTCAATGACGTGGGCTGGGAAAAGTGGATCATTGCACCCAGTGGCTACGACGCCTTTCTTCTGC
CTGGGTGAGTGTGCTTTCTTTGGCTGACCACATGAACTCTCAAGCCACGCCATGGTGCAAACCTCTGGTAAACTCTGT
GAATGGAGCAGTGCCCCGGGCTGCTGCGTCCCAACCTCTCTCAGTCCCATCGCCCTGCTCTACCTGGACTCTCAAGACC
GAGTTGTGCTGAAAAATTATCAGGACATGGTTGTGGAGGGCTGCGGCTGTGCGTAG

>OlaBMP2 (Japanese medaka; Accession numbers BAAF04048581, DQ915174, AM340447, DK232580, DK251511, AM380364, DE095303, DH343454, DE100795, DE077111 and BAAE01085765)

ATGGTCGCCGTGGTCCGCTGTCTCATGGTACTGCTGCTCGCTCAGGTGTGCTGGAAGGAGCTGCGGGACTCATCCCCGA
GGTCCGCCGAAGGAGGTACAGCGAGTCAGGGAGGCAGAGCGCAGGGCAGTCGGACAGCTTCTCCACGAGTTCGAGCTTC
GGCTTCTCAACATGTTCCGGGCTGGGGCGCAGGCCACCCCCAGCAAGCAGGCTGTGGTGCCGAGTACATGCTGGACCTT
TACCACATGCACTCTGCGCACGGGGAGCACAGCGCCAGGCGTCCCAGGAGCATGGGAAAACACGCGGAGAGAGCCGCCAG
CAGGGCCAACACGATTAGAAGCTTTCACCATGAAGAAGCGATGGAGGCCCTGGCCAGTCTGAAGGGCAAAAACAACCCAGC
AGTTCTACTTTAACCTCACCTCCGTTCCCGAGAAGGAGCTCATCACCTCTGCAGAGCTGCGCATTACAGGGATCAGGTG
AAAGGGGCGCAAACAGCAGCAACAGCAGCAGCCTGGTGGCCTTGGCGTCCACCGCATCAACATTTATGAGATGTTTGG
ACTTCTGCTTCAAAGGGCAGACCCTCTGGTGCCTGCTGGACACCCGCTGGTGCAGGACTCTTTAAGCCGCTGGG
AAAGCTTCGAGTCAGCCCCGCGTGTCCAAGTGGACCTCGGGGAAAGGCCACAACCACGGCTTCATGGTGGAGGTGCTT
CACCCAGGAGAAGGGGACGGTGAGCACGGGCAAAGACAAAAAAGGCACGTGAGGGTGAGCCGGTCTTGCACCAGGACCA
GGACTCGTGGCCTCAGGTGCGGCCGTTGTTGGTGACGTACGGTACGACGGCCGCGGGGACTCTGTGCTCCATAACAAGGG
AAAAAAGGCAAGCATCCCTCCGCAAGCAGCGCAGGAAAAACCATCACAAGCCAGCTGCAAGAGGCACGTTTTGTATGTG
GATTTACGCGATGTGGGATGGAACGAGTGGATAGTGGCACCCTGGCTACGATGCCTTTTATTGCCACGGGGAATGCC
CTTCCCCTTACCAGACCACCTCAATGCAACCAATCATGCCGTAGTGCAGACTCTTGTCAACTCGGTCAACTCGAACATCC
CCAAAGCCTGCTGTGTGCCACTGAACTCAGCCCCATCTCCCTGCTCTACCTGGATGAGTTCGAGAAAGTGAATCTGAAA
AACTACCAGGACATGGTGGTGGACGGCTGCGGCTGCCGGTGA

>OlaBMP4 (Japanese medaka; Accession numbers DK004345, AM140778, AM139646, DC268248, AM299276, AM339195, DQ915175, DK197479, BJ014414, DC244878, DC276748, AM384609, DC253831 and AV669968)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTAATATCCCAAGTCCTGCTGGGAGAGAGCAACCATGCTAGTCTGAT
ACCCGAAGAAGGGAAAAAGAAAGTACCTGGCCTGCAGGGTCGCTCGACCGCTCAGAGCCATGAACTTTTACGGGACTTTG
AGGCCACACTGTTGCACATGTTTGGCCTCAAAAAGCGCCCGCTCCAAGCAAAGCTGCCGCCGCTGCCTCGTTACCTGCTG
GATCTCTATCGACTGCAGTCAGGGGAGGCTGAAGACGTAGAGGCACACGAAATTCCTTTTGGATATCCCGAGAAGTACG
CAGCCGAGCCAAACCCGTCAGGGGCTTCCACCATGAAGACACATGGAGAGGATACACGAAGTGGATGATGCAGATCCA
TCCGCTTTCGCTTCCGTTCAACCTTAGTAGCATTCCAGAGGACGAGCTGCTGTCTTCCGAGAGCTGCGACTCTACCGT
CAGCAGCTGGGCGAGGCCAACGATGATAGCCCCCTAAACGACCAGGGCCTTCATCGGATAAACATATACGAGGTGCTTAA
ACCCCGCGGGCCCGGCGAGCTTATCACGCAGCTTCTGGACACCCGGCTTGTGCGCCACAACGCTTTCGCTTGGGAGAGCT
TTGACGTCAGCCCCGCTGTGCTACGTTGGACTCGGGAACGGCTCCCTAATTATGGACTGGCTGTGGAGATTCTCCACCTT
AATCAGACTCCACACAACCAGCACCAGCATGTCCGCATCAGCCGTTCTTACACCAGGAGCCAGGAGAGGACTGGGACCA
GGTACGCCCTCTTCTGGTTACCTTTGGCCACGATGGAAAGGGTCACTCATTGACACGCCGGACAAAACGCAGCCCCAAC
CACGAGGGCGTAAACGAAACCGCAACTGCCGGCGCCATACTCTGTATGTGGACTTTAGCGATGTAGGCTGGAATGACTGG
ATAGTGGCACCTCTGGTTACCAGGCCTATTACTGCCACGGAGAGTGCCTTTTCCGCTGGCAGATCATCTGAACTCAAC
TAACCACGCCATCGTGCAGACACTGGTGAATCTGTGAACAACAACATTTCCAAAGGCCTGCTGCGTACCAACAGAGCTCA
GCGCCATCTCAATGCTATACCTAGACGAATATGACAAGGTGGTCTAAAAAACTACCAGGAAATGGTAGTGAAGGCTGC
GGCTGCCGCTGA

>OlaBMP16 (Japanese medaka; Accession numbers BAAE01034973, BAAF04019993, BAAF04019995, BAAE01034974, BAAE01219338, AM318552, DK098052, DH423513)

ATGCTCCCTGCTAACATCCTGCTTCTCATGTTCTTGCTGCTACCTCAAGTCTCGTCTGGTCGCCAGGGTGAAGACACCAG
CGAGATTGACCATGGCAGGGTCCGCTCCACGTCTTCATCTCGACACCCACCCATCGATGGCGGATTTCAACCTTTCTC
AAACCATTCAGAATCTTCTTGGAGCCGACTGGGCTGCAGTCTCAGCCCTAACCTCAGTCTGGGATACCAGTCCCACAG
TACTCTTGTATCTGTACCGCTTCCACAAAAGCAGTACCATCTAGTGAAGAGCCCATCATTTAGCTTCCCAGCCAGCA
CATTCAACAGGCCAACACAGTACGCAGTTTTTCATCACCGCAGTCCCATGAAGACAGTCACACAGAGAAGGATCATACTA
GAGTACACATCTCATTTGACATCTCGTCCATCCCTCAAGAGGAGAGGGTGTCTCTCAGCCGAGCTTTCGCTGCTGCGCAGC
GACAAAGCTTCCCTGGGCTCCTGGATCACACAGACTGAACTATACTCTCAAAGCATCGCAGAGATCCTAAGCAGGCTTT
GCTGGAGACAAGGTTACTCGCCAACAACCTTCATAGCAATAAAACCAAGTGGTTTTCTGGGAAGCATTTACCATAAGTGCAG
AGCTTCTGCAAAAAATCCAAGCTGGTACTGGCAGCCTGGGCTTCTTCTTGAATCAAACCTGAAAATACTACCAACCCA

CTTCCTTACCAGATGTTTGCCTCTGCATCATATGAAGACAAGTCAGATGGACAAAAAGAGAGACACCTGAGAGTGTGCAG
GTCTGTGGGCCAAGATGATCACAGCTGGGCCAGGGAAAGACCCCTGCTGGTGACCTACAGTCATGATGGCCGAGGAGAGC
CTTTGATTAACATAGCAGGAAAACCTCTGGTAACAGTCAGAGGATTAGGGGGAAAAAGGGGTCAAAGGTGAGGGCCAGA
AACAGCAGTAAAGGTCACGATACAGCTAAAGCCTGGGGTAGGGCCAAAAAAGGGGTATTCTGTGCAGGACTGGGCGAC
TAAACAGGAGGGGTGAGTGGAGCGAACGAGGAAGGGTAAAAAGAAATGGTGGGCACTCCGCAAAATTAAGCGTATTT
CGCGTGGCAGATGCCGCCCTCATCCTCTACATGTAGATTTTAGAGATGTGGGTTGGCAAAGTGGATCATTGCGCCAGT
GGCTATGACGCCTTCTTCTGCCTGGGAGAGTGGCGTTATCCCCTGGTGCAGACACATGAACGCCTCGAGCCATGCTGTGGT
TCAAACCATGGTAAACTCTGTGAACGGAGCAGTGCCCCGTCCTGCTGCGTCCCCACCAGCCTCAGCCCCATTGCGCTGC
TTTACATGGACTCTCAAGATCGAGTTGTGCTGAAAAATTACCAGGACATGGTGGTGGAGGGATGTGGCTGCCTGTAG

>SsaBMP2 (Atlantic salmon; Accession numbers BT059611, CA061573, GE795400, GE795401, EG901180, EG901179 and CX353173)

ATGGTCGCCGTGTTTTCGTTCTCTCATGGTACTGCTGCTGGCTCAGGTGTTGCTGGGAGGGCGCTGCGGGACTAATCCCCGA
GGTTGGCCGGAGGAAGTACAGTGAGTCCGAGAAGCAGAGCCCCGAGCAGTCGGATAACTTTTCTCAACGAGTTCGAGCTGC
GGCTCCTCAATATGTTTCGGACTTAAGCGGAGGCCGAACCCGAGCAGACAGGCTGTGGTGCCTCAGTACATGGTGGACCTG
TACCGTATGCATTGCTTGAACGGAGACCACAGCACTAAACGGCCCCGGAGCATGGGGAGGCACGCAGAGAGAGCCGCCAG
CAAGGCCAACACGATTAGAAGCTTTCACCATGAAGAGTCCATGGAGGCTCTGGCCAGTCTGAAGGGCAGGACAACCCAGC
AGTTCTTCTTCAACCTCACCTCCATCCCTGGAGAAGAGCTTATCACCTCTGCAGAGCTCCGGGTATACAGGGACCAGGTC
CTGGGGGCCACAGCAGCTCCCACCAGTAACACCAGTCACAACAGCAGTAACAGCTCCAGTACCAGTGTGGTGGCTTCCA
TCGTATCAACGTGTATGAGGTGTTTGGAGCCCCCTGCGTCTCCCCGTGGGGAACCCCTGACACGCCTCTTGGACACGCGGC
TGGTGCAGGACTCTCTGAGCCGCTGGGAGAGCTTTGACGTCAGCCCCGCGTGTACAGTGGGCCTCCGGGGGGCGCCAC
AACCACGGCTTCCCTGGTTGAGATGCTCCACCCAGACACCCTGGGGGGCGAAGAGGGCCAAAGACAGAGACGACACGTCAG
GGTAAGCCGCTCCCTCCACGGGGACCAGAATCATGGCCCCAGGCTCGCCCCCTGCTGGTGCACCTACGGTTCATGACAGAC
AGGGGAATCGCGTGTGCACAGGACAAAGAGACAGGAGCAGCAGGACACAGGAACAGAGGAAGAAGACCAACACAAGGCC
AAGTCCCGCAGACATCCCTCTACGTGGACTTCAGCGCAGTGGGCTGGAATGAGTGGATAGTTGCACCCCCCTGGCTACCA
CGCCTTCTACTGCCACGGGAGTGCCCCCTCCCATTTGGCCGACCACCTCAACTCCACCAACCACGCCATCGTTTCAGACGC
TGGTCAACTCTGTGAACTCCAACATCCCCCGGGCGTGTGCGTGCACAGAGCTTAGCCCCATATCACTGCTCTATCTG
GATGAGTATGAGAAGGTCATCCTCAAAAACCTACCAGGATATGGTGGTGGAGGGATGTGGCTGCCGGTGA

>SsaBMP4a (Atlantic salmon; Accession numbers NM_001139844 DY702674, CX355133, GE769237, CA040511, DW541811, DW551593, CK893345, CB500013, GE769238, CA055499 and DW551594)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTTATTATGCCAAGTCCTGCTGGGAGAGAGCAACCATGCTAGTCTGAT
ACCTGAGGAAGGGAAGAAGAAAGCCCCGGGCCTGCAGAGTCGGACGGCTGGTCAGAGCCATGAAGTCTGCGGGACTTTG
AGGCCACGCTGCTGCACATGTTTGGGCTGCAGAGGGCACCAGCGGCCAGCCGCTCGGCCACCGTGCACGCTACCTACTG
GACCTCTACCGACTGCAGTCGGGTGAGGCCGAGGAGGCCGGTGCCTATGACGCCGCCTTTGAGTACCCCGAGAGGTTCGGC
TAGCCGCGCCAACACCGTGAGGGGCTTCCACCACGAAGAGCACATGGAGCGGGTTTCATCTGGGCGATCTTCAGACGAAGA
ATGGCGAGGCCCGCCCCGCTGCGCTTCCCTCTCAATCTCAGCAGCATCCCAGAGGACGAGCTGCTCTCGTCGGCCGAGCTG
CGTCTGTTCCGGCAGGAGATCGACGAGGCCATTTCCGGGAGCGGGGGGACAAGGAGGGGCTCCACCGGATAAACGTGTA
CGAGTTCTGAAGCCCCCGGGCCGGGCAGCTAATCACGCGGCTCTTGGACACGCGACTGGTTTCGGCATAACGCCTCGC
GCTGGGAGAGCTTCGAGCTGAGCCCCGCGTGTGCTGGACACGGGAGCGCTTGCCCAACCTCGGGCTCGCTGTGGAG
GTCTGACACCTCAACCAGACACCGCGCCACCAGGGCCGCCACGTCGTCATCAGCCGCTCACTGCACCAGGAACCTGGGGA
GGACTGGGAGCAGCTACGCCCCCTGCTGGTACCTTCGGCCACGACGGCAAGGGCCACCCGTTGACGCGCCGGGCCAAGC
GCAGCCCAAAGCAGCGGGGGCGTAAGCGCAACCGCAACTGCCCGCTCACGCGCTGTATGTGGACTTCAGTGTATGTGGGC
TGGAATGACTGGATAGTGGCGCCCCAGGGTACCAGGCATACTACTGCCATGGGGAGTGGCCCTTCCCTCTGGCAGACCA
CCTGAACTCTACCAACCACGCCATCGTGCAGACGTTGGTGAACCGGTGAACACCAACATTCCCAAGGCCTGCTGCGTGC
CCACGGAGCTCAGTGCCATCTCCATGCTCTACCTGGATGAACACGACAAGGTAGTCTCAAAAACTACCAGGAAATGGTA
GTGGAAGGGTGGCGTTGCCGCTAA

>SsaBMP4b (Atlantic salmon; Accession numbers CX354839, DW573815, DW573814, CA056395, FJ195610)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTTATTATGCCAAGTCCTGCTGGGAGAGAGCAACCATGCTAGTCTGAT
ACCTGAGGAAGGGAAGAAGAAAGCACCGGGCCTGCAGAGCCGACTGCTGGTCAGAGCCATGAAGTCTGCGGGACTTTG
AGGCCACGCTGCTACACATGTTTGGACTGCAGAGGGCACCAGCGGCCAGTCGCTCGGCCACTGTGCCACGGTACCTGCTG
GACCTCTACCGGCTGCAGTCGGGCGAGGCTGAGGAGGCCGGCACCCACGACACCGCCTTTGAGTACCCCGAGAGGTTCGGC
TAGCCGCGCCAACACCGTGAGGGGCTTCCACCACGAAGAGCACATGGAGCCGGTTTCATCCGGGCGAGTCTCAGACGAAGA
ACGGAGAGGCCATCCCCTGCGCTTCCCTCTCAATCTCAGCAACATCCCAGAGGACGAGCTGCTCTCGTCGGCCGAGCTG
CGTCTGTTCCGGCAGCAGATCGACGAGGCCATTACGGAACGAGGGGACAGGATCAGCTCCACCGGATAAACCGTGTGTA
CGAGTTCTGAAGCCCCCGGGCCGGGCAGCTAATCACGCGGCTTTTGGACACACGGCTGGTGCACCATAACCCCTCGC
GCTGGGAGAGCTTTGACGTGAGCCCCGCGTGTGCGTGGACACGGGAGCGCCTGCCCAACTACGGGCTGGCCGTGGAG
GTCCAGCACCTCAACCAGACACCACGCCACCAGGGCCGCCACCTGCGCATCAGCCGCTCGCTGCACCAGGAGCCCGGGGA
GGACTGGGAGCAGCTACGCCCCCTGCTGGTACCTTCGGCCATGACGGCAAGGGCCACCCGTTGACGCGTGGACCAAGC
GCAGCCCAAAGCAGCGGGGGCGTAAGCGCAACCGCAACTGTGCGCGTATGCTCTCTACGTGGACTTCAGCGATGTAGGC
TGGAATGACTGGATAGTGGCGCCCCAGGGTACCAGGCATACTACTGCCATGGGGAATGTCCCTTCCCCCTGGCAGACCA

CCTGAACTCTACCAACCACGCCATTGTTTCAGACGTTGGTGAACACCAACATTCCCAAGGCCTGCTGCGTGC
CCACGGAGCTCAGTGCCATCTCCATGCTCTACCTGGACGAACACGACAAGGTGGTCTAAAAAACTACCAGGAAATGGTT
GTGGAAGGGTGTGGCTGCCGCTAA

>SsaBMP16 (Atlantic salmon; Accession numbers AGKD01064384, CK879241, CK879040)
ATGTTCCCTGCTAAACTCTTGGTCCTGATGGTCCTACTGCTACCTCAAGCTTCGTCTGGTCGCCAGGGCTTTGCCACCGA
GCCCCGATGGCAGTGTGCCGTCGTTGTCACCGTTATCACCCACCCCCCTGGAGCCCAGCCTGGCCCAGACAATCCAGAACC
TGTTCGCTGAGCCGCTGGGCCTGCAGTCCCACCCCAACCCCCGGCCAGGTGCGCCCATCCCCAGTACATACTGGACCTC
TATCGCTTCCACTCCCAGCAGTACCACCTAGTCCAGGATCCACACTTCAGCTACCCCAGCCAGCATGTCCAGGAGGCCAA
CACCGTACGCAGCTTCCACCACACAGAGTCTACCAGCCCCAACTCCCCCTTGAAAAGAGGCTGACCACCGTGAGCAACA
ACAAGGTCCCCATCTCCTTCAACGTGTCTCCATCCCCCAGGATGAGTGTGTGGTTTCTGCCGAGCTGCGTTTCTTCCGA
GGTGGTGGGGCTAGCCTAGGCCCGGGCGCCACAAGGTGAGCCTGTTTCTCGATGGAGGCACTGGGGACTCTGAGTCTGA
GCCACTCTGCTGGAGTACGGCTCCTCACAGGGGCCCCAGCCTAAGCCAGCTGGCTCCTGGGAGGCCCTTACGCTCA
GACTGAACTCTTCGTAGGGGCCACGCTCAGACCGGCAGCCTGGCCTTCTCCTTGAGGTGACCCCTCTGGGTAACACC
ACCCTCCTACCCCCCTGACCATGATGCTCTACCCTCTCCACTGGGGAGGAAGGGCGCAGAGAGGGACACCTGAGGGT
GCGCAGGTCTCTGGGACAGGACGAGCACAGCTGGGCACGGGAGAGACCCCTGCTGGTTACTTACAGCCATGACGGGCACG
GGGAGCCACTAGCCGCCATGGCCGGAGAACCCTTGACACCGCCAGAGGATGAGGGGGAGGAAGCGGGCCAGAGAAAGG
GGCAGGAGCAACAGCAGGGACCGGGAAAGGGACAGAGACAAGGACAGGGACTGGAGCGCCAGCCCTGGCTGGGGCGGCAG
CTGGAACGAGGGTGAAGGGTGAAGCGCAATGGTGGCCGGGCAGCGAACTGAATCGTCTGTCCCGCGCCCGCTGCCGCC
GCCACCCGCTCTACGTGGACTTCAAAGACGTGGGCTGGAACAAGTGGATCGTGGCGCCTAGTGGCTACGACGCTTCTTC
TGCTGGGGGAGTGGCGCTTCCCACTCACCCACCACATGAACTCATCCAGCCACGCCATGGTGCAGACGCTGGTGAACCTC
GGTGAACGGAGCTGTGCCGCGGGTCTGCTGCGTACCCACCGCTCTCAGCCCCATCGCCATGCTCTACCTGGACCCGAGG
ACCGCTGGTGTCTAAAAACTACCAGGACATGGTGGTGGAGGGCTGTGGATGCCGGTAA

>TniBMP2 (Spotted green pufferfish; Accession number AC141355)
ATGGTCGCCGTGGTCCGCTCTCTCATGGTACTGCTGCTCGCTCAGGTGTTGTTGGAAGGTGCTACTGGACTTATCCCTGA
GGTCGGCCGGAGGAGATACAGCGAATCTGGGAAGCAGAGCCCACAGCAGTCAAGAGGGCTTCTCAACGAGTTTGGAGCTTC
GGCTTCTCAATATGTTCCGACTGAAGCGGAGGCCACCCCGAGCAAGCAGGCTGTGGTGGCCGAGTACATGGTGGACCTT
TACCGCATGCACTCGGCGAACGGAGATCACAGCGCTAAACGACCCAAAGAGCATGGGGAGACATGCAGAGAGAGCCGCCAG
CAAGGCCAACACGATTAGAAGCTTTCACCATGAAGAGTCGATGGAGGCACTGGCCAGGCTCAAAGGCCAAAACAACCTCAAC
AGTTCATTTTTAATCTCACATCCATACCTAAAGAAGAGCTCATCACCTCTGCAGAGCTCCGTATCTACAGGGATCAAGTC
ATGGGAGCTGCATCCACCAACAACAGCTCTACCAACAGCAGCACCAGTGATAAGGCTCATGCTGGTGGCTTCCATCGCAT
CAACATCTACGAGATATTCGGAGTTCTCAAGGCAGGGAACCTCTGGCACGTCTGTTGGACACTAGGCTTGTTCAGGACT
CTCTGACCCGGTGGGAGAGCTTCGATGTGAGCTCTGCTGTATTTAGTGGACCTCTGGGAAAGGCCACAATCACGGCTTT
ATGATAGAAGTGCTTCATCCAGAGGAGGGCGAGGTAGAACAGGAGCGAGCCGACAAACATAGCAGACATGTGAGAGTGAG
CCGGTCTTGCATCAGGACCGGGACTCATGGCCTCAGGCCCGGCCTTTGCTAGTAACGTACGGCCACGACGGCCCGGGG
ACTCGGTGCTCCACACCAGGGAAAAACGTGAGGCAGCACTCCGCAAACAGCGCAGGAAACACCAACACAAGGCCAGCTGC
AAAAGGCATGCCCTGTATGTAGACTTTAGTACGTTGGGTGGAACGAGTGGATTGTGGCACCCCTGGCTACCATGCCTT
TTATTGCCAGGGAGAATGTCCATTCCTCCCTGGCAGACCCTCAACTCTACCAATCATGCCATTGTGCAAACACTGGTCA
ATTCAGTCAACTCGAATATTCCTCCGAGCTTGTGCGTGGCCACTGACCTCAGCCCCATCTCCTTACTCTACCTGGATGAA
TATGAAAAGTCACTCTAAAAACTACCAAGACATGGTGGTGGAGGGATGTGGCTGCCGGTGA

>TniBMP4 (Spotted green pufferfish; Accession number CAAE01015019, AC141355 and
AL292165)
ATGATTCCTGGTAATCGAATGCTGATGGTTATTTTTAATATGCCAAGTCCTGCTGGGAGAGAACAACCATGCAAGTCTGAT
ACCTGAAGAAGGGAAAAAGAAAGTACTGGGCCTGCAGGGTCGTTCCGCCACTCAGAGCCATGAACTTCTACGGGACTTCG
AGGCCACGCTGCTGCACATGTTCCGGCCTCAAGAGGCGGCCGAGGCCAGCCGCTCGACCGCCGTCCCCAATACTGCTG
GACCTCTACCGGCTGCAGTCCGGCGAGGCTGAGGAGGCTGGAGGGCAGGATATCGCATTTGAGTACCCGGAGAGGGCAGC
CAGCCGGGCCAACACTGTGAGGGGCTTCCATCATGAAGAGCACATGGAGATGATTTACGCGCCGGATGATGGCGAATTGA
CGCCCTTCGATTCTTGTTCACCTTAGCAGCATTCCAGAGGACGAGCTGCTGTCTCCGCCGAACCTGCGGCTCTACCGC
CATCAGGTTAATGAGGACAACGTCACGCTCTCGGCAGACCACGGGCTCCATCGGATAAACGTGTATGAGGTGCTCAAGCC
CCCTAGGCAAGGGCAGCTAATCACGCAGCTCCTGGATACGCGGCTCGTCCGCCACAACGCGTCACGCTGGGAGAGCTTCG
ATGTGAGCCCTGCTGTGCTACGCTGGACTCGTGAAGGCCAGCCCAATTATGGATTGGCCATAGAGGTTCTGCACCTCAAC
CAAACACCGCGCCACCAGGGCCGACATGTCCGAGTACAGCCGCTTTTACACCAAGAGCCTGGGGAGGACTGGGAGCAGCT
ACGCCCGCTCCTGGTACCTTTGGTACGACGGGAAAGGTACCCGCTCACCCGGCGTTCCAAGCGGAGCCCCAAGCAGC
GAGGACGTAACGCAACCGCAGCTGCCGGCGCCACTCGCTGTACGTGGACTTTAGCGACGTGGGCTGGAATGACTGGATA
GTGGCGCCCCCTGGTTACCAGGCCTACTACTGCCATGGGGATTGTCCGTTCCCCCTGGCGGATCATCTGAACTCGACCAA
CCACGCCATTGTTTCAGACACTGGTGAATTCCTGTAACAGCAACATTCCTCAAGGCCTGCTGCGTGGCCACCGAGCTCAGTG
CCATTTCCATGCTCTACCTAGATGAACACGACAAGGTGGTCTAAAAAACTACCAGGAAATGGTGGTGGAGGGCTGCGGC
TGTCGCTAG

>TniBMP16 (Spotted green pufferfish; Accession number CAAE01014537.1 and AL336493)
ATGCTCCCTGCTAACCTCCTGCTCCTCATGGTCCTGCTGCTACCTCAAGTCTCGTCTGGTCGCCAGGGTGGAGACGCCAG
CCAGACTGACCATGGCAGAGTGCCCCCGTGGCCTCGTCCCTTCTGAGCCACCAGCCGCTCCCAGCCTGAAGCCCAGCC

TGGCCGAGACTATCCAGAGTCTCCTCCTGAGTCGCCTGGGCCTGCAGTCGCAGCCGGACCCTCGGCCTGGAGTCCCCGGTG
CCTCGGTACCTCCTGGATCTGTACAGATTCCATCAGCAGCAGTACCACCTAGTGGAGGACCCTTCATTTCAGCTTCCCCAG
GCAGCACATCCAGCAGGCTAACACCGTTTCGCAGCTTTCACCACAATGAACTTTCTGATGACAATTCCCTACCTGATAATC
CTCAGAGGGTGCACATCTCCTTCAATATCTCCTCCATCCCTGAAGACGAGAGGGTGTCTCTCCGCCGAGCTTCGACTCCTC
CGAAGCAGCAGAGCCTTTTGGGGCCCTGGGGTCCACAGATTGAACATTTACCTTGTGGAGAGTATGGAGACCCTGAGCC
CACCTGCTGGAGACACGATTATTCACCAGTCTAATAATACTCATGAATCAAGTAGTCTCTGGGAGGCCTTTCTCTAA
CCTCAGACATTCTCCTTGAAGTCTTGGTGGGACTGGCACCCTGGGCTTCTGCTGGAGGTCAGACCTGAGAACAGAACC
TCCTCAGGCGTCCAGCAGAACGTCTATGCTGCAGCAGGTAAAGAGGATGCTGAGAAAAGAGGGACACCTGAGGGTCCGTAG
GTCCGTGGGTGAGGATGAGTACAGTTGGACCCAGGAGAGACCTCTCTTGGTGACCTATAGCCATGATGGGCGCGGAGAAC
CTTTAGCCAACCATGGCAGGAGGACCCCCGCTGGCGCCAGAGGATCAGAGGGGAGAAAAAGACCAAAGACAGAGAAGCC
AGGAGCAGCAAGAAAAGCCGCGCTAGCGATCCAAACAGTAGGAAGGACAAAACAGGATATTCTGTGCCAGGATGGGGTTCG
TGATAAAGGAGGGGTGGTTTGAAGGAGAACCGAAGGGTGAAGAAGAAACAACGGCCGTGCCGCAAACTAAAACGCCTTT
CCCGTAACAGATGTCGCCGGCATCCCCTGTACGTAGATTTCAATGACGTAGGCTGGCACAAGTGGATCATTGCCCCAGC
GGCTACGATGCCTTCTTCTGCCTGGGAGAGTGCCTTTCCCCTGGCTGACCACATGAACTCCTCCAGCCACGCCATGGT
ACAACTCTGGTCAACTCTGTGAACAGAGCCGTTCCGCGGGCTTGTGCGTCCCCACCTCCCTCAGCCCCATCGCCCTGC
TCTACCTGGACCCGCAAGACAGAGTCTGCTGAAGAACTACCAGGACATGGTGGTGGAGGGATGTGGCTGCCGGTAG

>XmaBMP2 (Southern platyfish; Acession number AGAJ01019336)

ATGGTTCGCCGTGGTCCGCTCTCTCATGGTACTGCTGCTCGCTCAGGTGTTGCTGGAAGGTGCTGCGGGACTCATCCCCGA
GGTCCGCCGGGAGGAAGTACAGCGAATCTGGGAAGCAGAGCCCCGAGCGGTTCGGAGAGCTTCTCAACGAGTTCGAGCTTC
GGCTTCTCAACATGTTCCGGTGGGGCGCAGACCCACCCCCAGCAAGCACGCCGTGGTGCCACAATACATGGTGGACCTT
TACCACATGCACCTGCAAACGGAGACCACAGCACTAAACGACCCAAGAGCATGGGCAAGCACGCAGAGAGGGCCGCCAG
CAAGGCCAACACGATTAGAAGCTTTCACCATGAAGAATCAATGGAGGCATGGCCAGCTGAAAAGCAAAAACAACCCAGC
AATTCTACTTCAACCTCAGTCTATCCCTAAAGAGGAGCTATAACCTCTGCAGAGCTCCGCATTTACAGGGATCAGGTC
ATCGGAGCGGCACCTCCTAAGAACAGCAGCTCTACTAGTGGTCTCTTGTGAGGAGCCTCCATCGTATCAACATCTACGA
GATCTTCAGAGTACCAATAGGCACAGAACCTCTGGTCCGTCTGCTAGACACCAGGCTGGTTCAGGACTCTTTGAGCCGCT
GGGAGAGTTTTGACGTGAGTCTGCTGTATCTGAATGGACTTCGGGGAATGGCCGAATCATGGCTTCATGGTGGAGGTG
CTTCATCCAGAGCAGACAGAGAAGGCTGCAGAGCATTCCCAGAGAAGAAAACAGGCACGTCAGGGTGAGCCGGTCCCTGCA
CCAGGACCAGGACTCATGGCCTCAGGCTCGGCCCTGCTGGTAACATATGGTACGACGGTCTGGGGACTCAGTACTCC
ATACACGGGGGAAAAGGCAGGCAGCAGTCCGGAAACAACGCAGGAAGCATCAGCAAAAGGCAAGCTGCAAAAGGCATAACC
TTGTACGTAGATTTTCAGCGACGTGCAATGGAACGAGTGGATAGTGGCACCCCCAGGCTACCATGCCTACTACTGCCATGG
GGAATGCCCTTTCCATTACCAGACCACCTTAATGCAACTAATCATGCCATTGTGCAGACACTTGTCAACTCAGTAAACT
CAAACATCCCCAGAGCCTGTTGTGTGCCACCGAACTCAGCCCCATTTCTGTTGCTCTACTTGGACGAATATGAGAAGGTG
ATTCTGAAAACCTACCAGGATATGGTGGTGGAGGGCTGTGGCTGCAGATGA

>XmaBMP4 (Southern platyfish; Acession number AGAJ01041398)

ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTATTATGCCAAGTCCTGCTGGGAGAGAGCAACCATGCCAGTCTGAT
ACCTGAAGAAGGGAAGAAGAAAGTGCCTGGCCTGCAGGGTCGTTCCGGCTGCTCAGAGCCATGAACTGTTGCGGGACTTTG
AGGCCACGCTGCTGCACATGTTCCGGCTCAGGAGGCGGCCGCGGCCAGTTCGCTCCGTCACCGTGCCCCGCTACCTGTTG
GACCTCTATCGGCTGCAGTCCGGGGAGGCCGAAGAGGCCGAGCGTACGACATCGACTTTGAGTATCCCCGAGAGTCCGC
CAGCCGGGCCAACACTGTGAGGGCCTTCCACCATGAAGAGCACATGGAGAGGATCCATGAGCTGGGTGATGGAGAATCCA
TGCTCTCCGCTTCTGTTCAACCTCAGCAGCATTCCAGAGGACGAGCTGCTTTCTCTGCAGAGCTAAGACTCTACCGT
AGTCAGATTGATGAGGCCACCGCTGACGACCAGAGTCTGCACCGCATAAACATCTACGAGGTCCTGAAGCCCCCGCGGCC
CGGGCAGCTCATCACCAGCTTCTGGACACACGCCTCGTTCCGGCACAACGCGTCACGGTGGGAGTCTTTTGTATGTCAGCC
CTGCCATCTTGGCTGGAGTCCGCGAGGGCCTCCCTAATTATGGTCTGGCCGTGGAGGTTCTGCACCTCAACCAGACCCCA
CACCACCAGGGCCGACACGTCGCGCATCAGCCGCTCGGTGCACCAAGAGCCCGGGGAGGACTGGGAACAGTTACGCCCTCT
TTTGGTTACTTTTGGTTCATGATGGCAAGGGTACCCACTGACCCGGCGGACCAAGCGCAGCCCCAAACAACGGGGCCGCA
AAGGCAGGCGCAACTGCCGGCGCCATGCACTGTACGTAGACTTCAGTGTGTAAGTGGAAATGACTGGATTGTGGCACCG
CCTGGCTATCAGGCATATTACTGCCACGGGGAGTGGCCCTTTCCCCTGGCAGATCATTTAAACTCCACCAACCATGCCAT
TGTTTCAGACACTGGTGAACCTCTGTGAATAACAACATTTCCCAAGGCCTGCTGCGTACCAACAGAGCTCAGCGCCATCTCCA
TGCTCTACGTGGATGAACATGACAAGGTGGTCTGAGAACTACCAGGAAATGGTAGTGGAGGGCTGTGGCTGCCGCTAG

>XmaBMP16 (Southern platyfish; Acession number AGAJ01016356)

ATGCTCCCTGCTAACCTCCTGCTCCTCATGGTCTTGGTGTACCTCAAGCCTCGTCTGGCCGCCAGGGTGGAGAATCCAG
CGAGACTGACAGTGGCAGGGTGGCCCCGACCCCTTCGTCGCCGCTCGCCCGCCGACGCGCTGCCCGATCCCGGTCTGGCTC
AGACCATCCAGTCTCTCCTCCTGAGCCGGCTGGGCCTGCAGTCTCAGCCGAACCCAGGCCCGACGTTGCCGGTGGCCGAG
TACCTCCTCGACCTTATCGCTTCCACCAGCAGTACCATTCTGTGGAAGACCCGACGTTACGCTTCCCCAGCCACCA
CATTGAGCAGGCCAACACTATTTCGAGCTTTCACCACAGTATTCTCTGAGAGACAACAAAATAAGAGATCAGACAA
GAGTGCACATTTCTTCAACATCTCCTCCATACTCAAGATGAAACGGTTCTCTCTGCTGAGCTTCGCCTGCTCCGCGAGC
CAGGCAGTGTCCCTGGGCCCGGGCCTCACAGATTAACCTGTACCTCTCTAAACACTATGAGGATCCTGAGCCACGTT
GCTTGGACAAAGACTACTCACCAGTGGCCTCCATGGCATTAAAGCCGGTAGTTTCTGGGAGGCATTTAGCCTAAATGCGG
ACCTCCTCCGTAAAGCCCATGGTGGGACTGGCAGCTTGGGCTTTCTCCTGGAGGTGAGACCTGAAAACAGCACACCTCA
CCTGACCAGAGCAACTCTTCTGCTGCAGGTGATAATCAGTCAGAGCAACATCAGGAGAGACACCTGAGGGTGTCCAGGTC
GGTGGGACAGGACGATCACAGCTGGGCCAGGAGAGACCCCTCCTGGTACTTACAGTCATGACGGCCATGGAGAGCCTT

TAGTCAAACACGGCAGGAGAACATCTGGTAACAGCAAGTGGATTAAGGCTAGAAAAGGGTCAAACATGAAGACCAAGAGA
AGCGGCAAAGGCCACAATAGAGACCAAGGCTGGGGGAAGACCCGAAAAATGGGTTACTCCATGAAGAGCTGGGGGGACGA
CAAAGGGGAGGTAAGCTGGCGTGATCGTGGAAGAGTGAAAAGAAACGGCAGTCCCGCTAAGCTGAAGCGGCTTTCCCGTG
GCAGGTGCCGGCGTCATCCTCTACATGTAGATTTAGAGATGTGGGCTGGCACAAATGGATCATCGCGCCGAGCGGCTAT
GACGCCTTCTTCTGCCCTGGGAGAGTGCCTTACCCTCTGGCCGACCACATGAACGCCTCCAGCCATGCCGTGGTCCAAAC
CATGGTAAACTCTGTGAACGGAGCAGTCCCCGGGCCTGTTGCGTCCCACCTCCCTCAGCCCCATTGCCCTGCTTTACC
TGGACAATCACGACAGAGTCTGTAAAGAATTACCAGGACATGGTGGTGGAAAGCTGCGGCTGCTGGTAG

>LchBMP2 (Coelacanth; Accession number JH126648.1)

ATGGTTGCCGGAGTCCGCTCTCTCATGGTTCTGCTGCTCTGCCAGGTCCTTCTTGGAGGTTCCGGCCGGGCTCATCCCGGA
GGTGGGCGGGCGCAAGTTCACCGAGTCTGGCCGCTCCAGCCCCAGCAAAGCGAAGAGATCCTCAACGAGTTTGAGCTCC
GGCTGCTCAACATGTTCCGACTGAAGCGGCGGCCAACCCTGGCAAGAGCGCCGTGATCCCGCAGTACATGCGGGACCTG
TACCGCCTGTATTCCCGGAGTGGTGAGGACAGTCTGGACCAGCACGGATCATCCCTAAATCCACAGCTGGAAAGATCTGC
TAGTCGGGCCAACACTATCAGGAGTTCCACCATGAAGAATCTTTGGAGGAACTACCAGAACTGGTACAAAAACAGCAC
GGCATTCTTCTTTAATTTATCTTCCATCCCTGGGGAGGAAATGCCTGCCTCAGCTGAACCTACGGATTTTTTCGTGAAGAG
GTCCAACCAACCTTGGCAAATAATTCCAGTGGCCACCACCGAATTAATATTTATGAAATTATAATGCCAGCCTCATCCAC
ACTGAGGGATCCCATACAAGACTGCTAGACACCAGATTGGTGCACCAAAGCCAGAGCAAATGGGAGAGTTTTGATGTGA
CCTCTGCTGTATGAGGTGGCTAATGTACCAGGAACCAATCATGGATTTGTGGTAGAAGTGGTCCACGTGGACAAAGAG
GAAAGTGCCTCCAAAAGACATGTTAGGATTAGCAGGTCTTTGCATGAAGATGAAGAAAGTTGGCCTCAGATGAGGCCATT
ATTAGTAACTTTCAACCACGATGGTAAGGGACACCCTCTCCATAAAAAGGGAGAAGCGCCAGGCAAGACCGAAACACAGGA
GACGGCTGAAATCGAGCTGTAGGAGGCATGCTTTGTATGTGGACTTCAGTGATGTAGGGTGGAAATGACTGGATAGTTGCT
CCTCCAGGGTATAATGCCTATTATTGCCATGGGGAATGCCATTTCCACTAACGGATCACCTGAACTCAACCAACCATGC
CATTGTTACAGACTTTGGTCAATTCTGTCAATTCAAATATTCCTAAAGCCTGCTGTGTGCCACAGAACTCAGTCCCATCT
CCATGCTCTATCTTGATGAGTATGACAAGGTTGTATTAAGGAATTATCAAGATATGGTTGTGGAGGGTTGTGGTTGTCCG
TGA

>LchBMP4 (Coelacanth; Accession number JH126564.1)

ATGATTCCTGGTAACCGAATGCTGATGATAATTTTATTATGCCAAGTCCTATTAGGGGGTAATACCCATACTAGTTTAAAT
ACCTGAGAAGGGGAGAAAAAAGTTTTCAGAGATTCAGGGCCAGGCAGGAGGACGTCGCTCTGGGCAAAGCCATGAACTCT
TGCGGGAATTTGAGGCAAGTTTGTGTCAGATGTTCCGATTGCAGAGACGGCCCCAGCCAGTAAATCGGTCGTGTCCTCC
CGTTACATGCTGGATCTGTACCGATTCCAGTCCGGGGATGAAAACGTAAAGGATATCAACTTTAAATACCCCCGAGAGATC
CACGAGCCGGGCCAACACAGTCAGGAGCTTCCATCACGAAGAACGCTTGGAAAAGGATTCCGGCCAACAGCGCAGACTCCT
TAAGCCACTTTTATATTTAACATCAGCAGTCTTCTGAAAACGAAGTGTTCCTCTGCAGAGCTGAGACTTTATAGGGAA
CAGATAGAACAAGGTCCCAGTTGGGAAGAACATTTTACAGAATCAACATTTATGAGGTCATGAGACCACCTAGCAGAAA
TGGACAACCTTATTACCAGACTACTGGACACTAGGCTGGTGCATCAGAATGCCACACAATGGGAAAGTTTTGATGTGAGTC
CAGCTGTTGTGAGATGGATCAGGGACAAACAACCATATCGTGGGTTTGTGTTGAGGTCATCCACCTTAACCAAAACAAAA
ACCCATCAGGGGAAACATGTCAGGATTAGCCGATCTTTACCTCAAGGGGATACAGATTGGTCCCAGTTGAGACCCTTTT
GGTCACTTTTACTCATGATGGCAAAGGACATGCACTGACCAGGAGGGTAAAAGGAGCGCTAAACATCAAAGATCCAGGA
AGAAAAACAAAACGTAGGAGACATGCTCTTTATGTGGATTTTAGCGATGTGGGCTGGAATGACTGGATTGTGGCACCA
CCTGGTTACGACGCATATTACTGCCATGGGGACTGCCCTTTCCCTTGGCTGATCATCTGAACTCTACCAACCATGCTGT
CGTTCAAACCTTGGTCAACTCAGTCAACTCAAATATACCAAAGCTTGGCTGTGTGCCACTGAGCTCAGCGAAATCTCAA
TGCTTTACGTAGACGAACATGACAAGGTTGTCTCAAAAACATAAGGATATGGTAGTACAAGGGTGTGGATGCCGTTGA

>LchBMP16 (Coelacanth; Accession number ENSLACT0000009133)

ATGGTCCCTGCTAACCTGTTATTTCCTGATGCTTCTCTTGCCACCCTATAACCCTTTTGGGTTCTGAGGACATTTTGCACCA
GCAAGAAGTCTGCCAGCTCCACCCTCCTGTCAAGAAGACCACCAACCGCACCCCTTGACCTCAATGTGATCCGGTCTG
TTCAGACCCTCCTGCTGACCCGCTTGGGGTCCGGAGCTGCCCCAGCCAAAACCAGGCCTCCTTATCCCTCAGTATATG
TGGGACCTGTACCGGTACCATCTGGAGACCTTCCCGCAATCCAAGACTCAGGATTCCAGATCCAGAAGAACACACAGG
GAAAGCAAACACCATCAGGGCCTTTCATCATCTTGAAGGACCAGAGAATGTTGGTGAGCCACAGGAAGACCAGATTTTTA
ATTTTCAGTTCAATATTTCTCTATTCCCGGGGATGAGAAGGTGACTTCAGCCGAACTCCGTTTGCACAAAGAGAAGCCC
AAAAGCTATGGAAATCCCTGCTACAAAGGGTTAACCTCTACCATATCACAGATCTCCAATCCAGGAGACGCCAACTTCT
AGAGACCAGGGTGTGACTCCTAACTGGGCCAGTGGGAGAGTTTTGATGTTACTCCTGCTGTGCTCATGTGGCTTCAAG
ATAGCATGGCTAATATGGAGTTTATGATTGAGGTGGTCCATCAAAATGGAACCAAGTAGATTGGAACCAGAGTGGATAT
CTGAGGGTGGAGGTCACCTGGTGAAGGTGAGGAAACCTGGGTTTCATCAGAGGCCATTATTAGTACCTATAGTCATGA
CGTTCGTGGCCAGCCTCTGGCACGAAGGACCAAAATAAAAGGAATGGGAAGATGCAGAAGTCAAAGAAGCGAGCAAAGC
CTAGATGCAAGAGGCATCCATTATTTGTTGACTTCAAAGATGTTGGGTGGAACAAATGGATTGTTGCCCAAGTGGTTAT
CGTGCCTTTTACTGCCATGGTGAATGTGTTTTCCCTTAGTGGATCACATGAACTCTTCCAGCCATGCCATGGTGCAGAC
ATTGGTAAACTCAGTAAATTTCAAAGTGGCCAGGGCATGCTGTGTGCCACGGACCTAAGCCCAATCGCCATGCTCTATC
TGGACCAACATGAGAGGGTGGTCTCAAGAACTACAATGACATGGTAGTGAAGGCTGTGGCTGCCGATGA

>AmexBMP2 (Axolotl; Accession number EU339232)

ATGGTGGCCGGGATGCGCTCGTGTCTGGTGTGCTCCTGTACCAAGTGTGCTGCTGGGCGGCTCGGTGGGGCTCATCCCGGA
GGTGGGCGGGCGCCGCTTCGCCGAGTCGAGCCGGGGCCCTGCCAGCGCGGGCCCCAGCAGCAGCAGCAGCAGCAGCTCCG
AGGACGTGCTGCGCGAGTTCGAGCTCCGCTGCTGCACATGTTCCGCTGAAGCGGCGGCCAGCCGAGCGCCGGCGCC

CCCATCCCGCCCTACATGCGCGACCTGTACCAGGGCCAGGGCCTGGACCTCCGGCAGGAGCGCTCCGCCAGCCGCGCCAA
CACCGTCCGCAGCTTCCACCATGAAGAAGTTTTTGAAGGCCTGCCTGAAGCAAGCGGAAAAGTCTGCAGCGTTTTCTTCT
TCAACTTGACTTCTATCCCTAACGAGGAGTTTATCACCTCGGCTGAACTCCGGATTTTTTCGAGAACTGGTACAGGAGACC
TCTGGCGGGAACAGCAGCACGCACCCGATTAATATTTATGAAATCCTCAAGCCCCCGCCGCGGGGGCCCCAGGAGCTGGT
CACGCGGCTGCTGGACACCCGGCTGGTGCAGCCCAACGCCAGCAGCTGGGAGAGCTTCGACGTGACCCCGGCCGTGCTGC
GGTGGCAGGTGCACGGGACCCCAACCACGGCTTCGTGGTGGAGGTGGCCACCTAGACAGTGAGCGCGGCCCTGGCCAG
CGGCAGTCCGCTCCGCCCTCCCGCAGCAGGACCGCACAGCTGGGCCCAGCTCCGGCCCCCTTTAGTAACTGCTTTGG
CCACGACGGCAAGGGCCACCCGCTGCACCGGCGGAAAAGCGCCAGGCGCGCCAGCGGCAGCGCAAGCGCCTCAAGTCCA
ACTGCCGGAGGCACCCCTCTACGTGGACTTCAGCGACGTGGGCTGGAATGACTGGATCGTGGCGCCCCGGGATACCAC
GCCTTCTATTGCCACGGGGACTGCCCTTCCCTCTGGCGGACCACATGAACTCCACGAACCATGCCATCGTGCAGACTTT
GGTCAACTCTGTGAATGCCAACATCCCAAGGCTTGCTGCGTGGCCACCGAGCTGAGCGCCATCTCCATGCTCTACCTGG
ACGAGAACGAAAAGGTGGTGTCAAGAATTACCAGGACATGGTCTGGAGGGTTGTGGGTGTCATTAG

>EcoBMP4 (Common coqui; Accession number AY525159)
ATGATTCCTGGTAATCGAATGCTGATGGTCATTTTTATTATGCCAAGTCCTGCTAGGAGGTACTAGCCATGCTAGTCTGAT
CCCTGAGACCGGAAAGAAGAAAGTGGCTGAGATTTCAGGGCCAGGCGGGTGAAGGAGGTCTGCTCAGAGCCATGAGCTCT
TGCGGGACTTTGAGACAACGCTGCTGCAGATGTTTGGCCTCCGCAAGCGGCCGCAACCCAGTAAGGAAGTGGTGGTGCCT
GCGTATATGCGGGACTTGTACCGACTACAGTCAGCAGAGGAAGAGGATGAGTTTTCAGGAGATCAACTTGAATATCCTGA
GAGACCTACAAGCCGTGCCAATACCGTGAGGAGCTTCCACCATGAAGAATATTTGGAGAACATACCGGGCACAGCTGAAA
ACGCCGGCATCCGCTTTTACTTCAATCTCAGCAGCATTCCTGAGAATGAGGTGATTTCTTCAGCTGAGCTAAGACTTTAT
AGAGAACAAATGAACATGGCCCAGCATGGGAAGAAGGCTTTCATAGAATAAATATATATGAAGTTATGAAGACTCTGAC
AGCAAATGGACAGATGATTACTAGGCTACTGGACACCAGACTAATCCATCACAATGTGACTCGGTGGGAAAGTTTTGATG
TAAGTCCAGCAATATGAGGTGGACCCAAGTCAAGGGAATTAACCATGGGCTTGCTGTTGAGGTCATTCATCTCAACCCAG
ACTAAAATTTATCAGGGGAAGCATGTCCAGGATTAGCCGATTTATTACTCAAGATAATGCAGACTGGTTCACAGTGGAG
GCCACTTCTAATTACATTTAGCCATGATGGCAGGGGACATGCCTGACCAGGAGTCCAAAAGAAGTCCATAACCCGACAG
GAGCCCGTAAAAAGAACAATAATGCCCGGAGGCATTCTCTGTATGTGGATTTTCAGCGATGTAGGCTGGAATGATTGGATT
GTGGCACACCTGGATATCAGGCTTTTTACTGCCACGGTGTATTGCCCGTTTTCCCTGGCTGACCACCTAAACTCAACCAA
CCATGCCATTGTACAGACTCTGGTTAACTCCGTAAATTCAGCATTCCCAAAGCATGCTGTGTTCCACAGAACTGAGTG
CTATTTCCATGCTCTATTTGGACGAGTATGACAAAGTAGTCCTTAAAAACTATCAGGAGATGGTAGTCGAGGCATGTGGC
TGCGCTAA

>XtrBMP2 (Western clawed frog; Accession number NM_001015963 and AC150281)
ATGGTAGCTGGGATCCACTCTCTGCTCCTGCTGCTGTTTTACCAGATTTTGTGAGTGGCTGCACCCGGACTTATACCAGA
GGAAGGCAAGCGGAAGTACACGGAATCTGGTCGCTCGTCTCCGCAGCACTCCAGAGTGTACTCAACCAGTTCGAGCTCC
GGCTGCTCAATATGTTTGGCTTAAAGAGGGCGTCCAACGCCTGGCAAAAACATTGTGATCCCACCCCTACATGCTGGACTTG
TACCACCTGCATTCAGGTCAGCTGGCTGCTGATCAAGACAGTTCCCCCATGGACTACCAGATAGAGCGTGCAGCTAGCCG
AGCAAACACCGTTAGGAGCTTTCACCATGAAGAATCCATGGAAGAAATTCGGAGTCTGGCGAGAAAACAATCCAACGAT
TCTTCTTCAACCTTTCTTCAGTTCCGAACGAGGAGCTGGTCACTTCTGCCGAGCTACGGATTTTTTCGAGAGGGGGTCCAG
GAGCCATTTGAGGGTGACAGCAGCAAACTTCATCGGATTAATATTTATGATATTGTCAAGCCAGCAGCGGCTGCCTCCCG
GGCCCCGTGTAAAGACTATTGGACACCAGACTGATACATATAACGAAAGCAAATGGGAAAGTTTTGATGTGACACCCG
CAATTAGACCGGTGGATTGCACATAAACAGCCGAACCATGGGTTTTGTTGTAAGTACTCATTGGACAATGACAAAAAT
GTGCCGAAGAAGCATGTGAGGATTAGCAGGCTTTTAGTCCAGATAAAGATAGCTGGCCTCGGATACGGCCGTTGTTGGT
GACTTTTAGCCACGACGGCAAAGGACATGCGCTTCAAAAAGAGAAAAGCGCCAAGCAAGGCACAAAACAACGGAAACGCC
TTAAATCGAGCTGCAGGAGGCATCCGTTGTATGTCGATTTTCAGCGACGTTGGTTGGAATGACTGGATTGTTGCCCCACCG
GGGTATCATGCCTTTTACTGCCACGGGAATGCCCTTTCCCACTGGCAGACCATTTAAACTCTACAAACCAGCTATCGT
GCAGACTTTGGTGAATAACGTCAACCCAAACATCCCCAAAGCTTGCTGTGTACCCACAGAACTCAGCGCCATCTCCATGC
TCTACCTGGACGAGAACGAAAAGTAGTATTAATAAATTCAGGACATGGTGGTGGAGGGGTGCGGCTGCCGTTAG

>XtrBMP4 (Western clawed frog; Accession number NM_001017034 and AJ315161)
ATGATTCCTGGTAACCGAATGCTGATGGTCATTTTTATTATGCCAAGTCCTGCTAGGAGGCACTAACCATGCCAGCCTGAT
ACCTGAGACGGGCAAGAAGAAAGTAGTGGCCGAGATTTCAGGGAGGTAGAAGGTCCGCTCAGAGCAATGAGCTCTTGCGGG
ATTTGAGGTTGACGCTGCTGCAGATGTTCCGGCCTCCGCAAGCGGCCGAGCCAGTAAGGATGTGGTGGTGGCCGCGTAT
ATGCGGGACCTGTACAGGCTTCAGTCAGCGGAGGAGGAGGATGAACTACACGATATCAGCATGGAGTACCCGGAGAGACC
GACCAGCCGGGCTAACACCGTGAGGAGCTTCCATCATGAGGAGCATTGGGAGAATCTACCAAGCACAGCAGAAAATGGAA
ATTTCCGTTTTGTGTTCAACCTCAGCAGCATTCAGAGAATGAGGTGATTTCTTCAGCAGAACTAAGACTCTATAGAGAA
CAAATAGACCATGGTCCAGCGTGGGAAGAGGGTTTTCCACCGGATAAATATATATGAAGTTATGAAACCAATAACAGCAAG
TGGACACATGATAAGTAGGCTGCTGGACACACGGCTAATCACCACAATGTGACACAGTGGGAAAGTTTTGATGTAAGCC
CTGCAATTATAAGGTGGACCCGGATAAACAGATAAACCATGGGTTGCCATTGAGGTTGTTCCCTCACCTCAACCAACAAA
ACTTATCAGGGAAGCATGTAAGGATAAGTCAGTCAATTATTACCTCAAGAGGATGCAGACTGGTTCACAGATGAGACCGCT
TTTAATTACATTCAGCCATGATGGCAGGGGACATGCCTGACCAGGAGGTCAAAAAGAAGTCCAAAACAGCAAAGACCC
GTAAAAAAAATAAACATTGCCCGGAGGCATTCTCTTTATGTGGATTTTCAGCGATGTTGGCTGGAATGACTGGATTGTGGCA
CCTCTGGATACCAGGCTTTTTACTGCCATGGAGATTGTCCATTTCCCTTGGCTGATCACCTAAACTCAACTAACCATGC
TATTGTACAACTCTGGTAAACTCTGTAACTCAAGCATCCCCAAAGCGTGTGGCTCCCCACAGATCTGAGTGCTATCT
CCATGCTTTATTTGGATGAATATGACAAAGTCCTTAAAAACTATCAGGAGATGGTGGTGGAAAGGGTGTGGGTGCCGT

TAA

>AcaBMP2 (Green anole; Accession numbers XM_003215309 , EU402671, FG668269, FG668317, FG670828, FG670684 and AAWZ02005417)

ATGACCATGGTTGCCAGGACCTGCTCTCTACTAGCACTGCTGCTTTCTCACATATTGCTTGGTGGTTTCGGCCAGTCTCAT
CCCAGAGGTGGGGGACCGGCGCAGGTTTCAGTAGCGATTTGGGTGAGGCTGCCCCCTGCAGCTCTCGGAAGGGATCCTGC
GTGAATTTGAACCTCGTCTGCTCAACATGTTTGGGCTCCAGCGACGGCCGACCCCAAGCAAGAATGCCATAATTCTCCT
TATATGTTGGAGCTCTACCACCTGCACACGAGTCAGAAGCCAGCTACCATGGACTATAATCTGGAGAGAGCTACCAGCAG
GGCCAATACAGTTAGGAGCTTCCACCATGAGGAATCACTGGAAGAGCTTCTGAAAGAAATGGGAAAACATCCCCGGCGTT
TCTTCTTTGACTTAGCATCCATTCCAAGTGGGGAGTTTATCACTTTCAGCTGAGCTCCAGATTTTTTCGGGAGCAGGTCCAA
GATACCTTTGGTAGCAACAGCAGCTCTCACCATCGTATTAATATTTATGAAATAATAAAGCCAGAGGGAGAGGCTTCTAA
GGACCTTGTACAAGACTTTTGGACACCCGATTAGTGCATCACAATGCCAGCAAATGGGAAACCTTTGATGTAACACCAG
CGCTAAGGAGATGGGTTGCGCATGGACAACCCAATCATGGTTTTGTGGTTGAGGTGTTGCATTTGGACAAGAAGAACAAT
GTCTCCAAGAGGCATGTCAGGATCAGCAGGTCATTGCATCAGGACGATGGGAGCTGGTCTCAGCTCAGGCCGCTACTAGT
AACCTTTGGACATGATGGGAAGGGCCACCCTCTCCATAGGCGAGAGAAACGCCAGGCCAAAATATAAAGAACGCAAACGCC
ATAAATCCCATTGCAAAAGGCATCCTTTATACGTAGACTTCAATGATGTAGGGTGAATGACTGGATTGTGGCCCCACCG
GGCTATAGTGCCTACCCTGCCGTGGAGATTGTCCCTTTCCATTGGCAGATCACCTCAACTCCACAAATCATGCCATTGT
TCAGACTCTGGTCAATTTCAGTGAATTCAAAATCCCCAAAGCTTGTGTGTGCCGACGGAAGTGGTCTATCTCCATGC
TCTACCTTGATGAAAATGAAAAGGTTGTACTCAAGAACTATCAAGACATGGTTGTGGAGGGCTGTGGTTGCCGCTGA

>AcaBMP4 (Green anole; Accession numbers GL343794.1)

ATGAAGCAGCCTAGAATTCCTTGCTGTCCCATGTTGTAATGCCGGCGCTGTTTTCTCTTCCCTCCCGCTTCCCAGAGCA
CCTGGAGCAAGTGCCGGGTTTCGGATCCCCGCCTGGGTGCTTCCGCTTCTTCTTCAACCTGAGCAGCGTGCCTGGCGGTTG
AGGCCATCTCTACCGCAGAGCTACGCTCTTTCTGAGCGGATCCCCGATGCTGCGGAGGACGACGAGGGTGCATCCAC
CGGATCAACATTTACGAGGTGATGAAGCCGTGGCGGGGACGGGAGGACCCGGTCAACCGGCTGCTGGACACTCGCTGGT
CGCCACAACGTGAGCGGCTGGGAGAGCTTCGACGTGAGCCAGCGGTTGTCGCGATGGACGGCGGGCGGTCAGCCCAACC
ACGGCTTGGCGGTGGAAGCCCTCCACCTCCACCCCAAGCAGACTCACCAGGGCCGGCACGTCCGGATGAGCCGCTCTTTA
CCTCAAGGCGGGGGCGCCTAGAGGACGGCGCTTGGGCCACCTCCGTCCTTCTGGTGACTTTTTGGCCACGACGGTCC
CAGTGGCTCGGCCCTGACGCGGCGCCGGAGGGCCAAGCGGAGCCCCAAAGGACCCGGAGGCTCCGGCGGGCGGGCACAAC
GCAAGGGCAAGAAGAAGTCCCGGCGCCATGCCCTCTATGTGGACTTCAGTGACGTGGGCTGGAACGATTGGATTGTGGCT
CCGCGGGGCTACCAAGCCTTCTACTGCCACGGCGACTGCCCTTCCCTTGGCCGACCACCTCAACTCCACCAACCACGC
CATCGTCCAGACGCTGGTCAACTCCGTCAACGGCAGCATCCCCAAGGCGTGTGCGTGCCACCGAGCTGAGCGCCATCT
CCATGCTCTATTTGGACGAGTACGACAAGGTGGTCTCAAGAACTACCAGGAGATGGTGGTTCGAAGGATGCGGGTGCCGT
TGA

>AcaBMP16 (Green anole; Accession numbers GAFZ01245723.1)

ATGGTGTCTGGTAACTTGGCTGTTCTGTGCGATGCTTTTTGTGTCACTTGCCTTCTGGAGATTTGAAGCCCCCAGGGAGC
ATCACCTGGAACCGACAAACATGACCCTAGAGAAGTCCAATCCAGGCCCTCCACACTATCCTGTTAAGACGCCTAGGCT
TGCAAAGGCGGCGGAACCAAAACCAGGCCACGTGGTCCCCCAGTACCTGCTGGATTTGTACCAATTTGCCTTAGGAAGG
GTTCTCCCTCCTTGCAGGGAACGGATCTACCTTTCTTGGAGGAACAGGCGGGAAGAGCCAACACTGTGCGCACATTTCA
TCATGTCGAGGATCCAGATTACTTTCTGACCTGTAGGAAATGAATTTTACTTCTTGTTCACCTCACCTTGCTGCCTG
CAGAGGAGGACTGACTGCCCTTGAGTTGCGCCTCACCACAGAGAGAGAGAAAGCAAGGTTTTTCACATCAACCTACTAC
CACAAATGGATCCCCACTCATTTCCAGAAACAAGAGCAGACTCCTGGCCCGCAAATTTCTGGCTCCAAACCAGTCCAA
GTGGAAAGCTTTGATGTGACTCCTGCCTATAAGACAGCCAAGAACCAGAAGCTTCATCTTGGGTTTCTTGTGTGAGGTGG
AGCACCCAAACAATAGCTATAACCTTCAAGAGCACACACATCCGCTCGTGCAAGACGGTCTCTTGGAGAGGAGGCAGCT
CAGTGGGCTCTGGAGAGGCCCTTTACTAGTTACTTATAGCCACGACCAAAAGAGGGCAACCCCTGACACGTGAAAAAGACA
CAACAGAAGTCAGTCAAATGCACTAACCCAGAAAGGAGGCAGAAAACCTACAAAAGGTGCGGTCTCCAAGAACAACACTCA
AGAGCCTAAAGGCAAAGACCAAAATCAGTACCAAGTCAAAAAGGCACCGCTTGTGTGTAGATTTCAAAGAGGTTGGTTGG
AACGATTGGATAGTTGCCCCAGTGGCTACCACGCATTCTACTGCTCTGGGGAATGTCAGTTCCCACTGGCTGACCATAT
GAATTCCTCCAGTCATGCTGTGGTGCAGACAATGTTGAATTTCTGTGAACTCCAAAGTGCCTAAGCCATCTTGTGTTCTTA
CAGACCTCAGTCCCATAGCTATGCTCTATCTGGATCAACATGACATGGTGGTCTTAAACCTATCAGGATATGGTGGTG
CAGGGCTGTGGGTGCCGGTAA

>GgaBMP2 (Chicken; Accession numbers NM_204358, X75914, BU137064, BU114214, BU444424, AL585496 and AADN02041168)

ATGGTTGCCGCCACCCGCTCCCTCCTGGCGCTGCTGCTCTGCCGGGTGCTGCTGGGCGGCGGGCCGGCCTCATGCCGGA
GGTGGGACGGCGGCGCTTCAGCGAACCAGGCGCGCCGCTCGGCCGCGCAGCGCCCCGAGGACCTCCTGGGCGAGTTTCG
AGCTGCGCCTGCTCCACATGTTTCGGGCTGAAGCGGCGGCGGAGCCCCGGCAAGGACGTCGTCATCCCCCCTACATGTTG
GACCTCTATCGCCTGACAGCTGGCCAGCAGCTGGCTACCCGCTGGAGAGGGCCGACGCGCCCAACACCGTGCAGCAG
CTTCCACCACGAAGAAGTTTTGGAAAGAACTGCCAGAAACAAGTGGGAAAACAGCAGCAGCTTTCTTTAATTTAACTT
CCATCCCCTAATGAGGAGTCTGTACCTCAGCTGAACTCCAGATTTTTTCGGGAGCAGGTGCACGAAGCCTTTGAGAGCAAC
AGCAGCTACCATCACCGTATTAATATTTATGAAATTTATGAAGCCAGCCACAGCCACCTCCAAGGACCCCTGTCACGAGACT
TTTGGACACCAGGTTGGTGCATCATAATGCAAGTAAATGGGAAAGTTTTGATGTAACGCCAGCTGTTTTGAGGTGGATTG
CACACGGACAACCTAACCATGGGTTTTGTGGTGGAGGTGGTTCACTTGGACAAAGAGAACAGTGCCTCCAAGAGGCACGTT

AGGATTAGCAGGTCTTTACATCAGGATGAAGATAGCTGGTCTCAGCTCAGGCCGTTGTTAGTGACGTTTGGGCATGATGG
CAAGGGACACCCGCTCCACAAAAGAGAAAAGCGTCAAGCGAAACACAAACAGCGTAAGCGCCACAAATACAGTTGCAAAA
GGCATCCGTTGTATGTGGACTTCAATGACGTGGGGTGAATGACTGGATTGTTGCCCGCCGGGGTACAGTGCCCTTTTAC
TGCCATGGGGAATGTCTTTTCCGCTGGCAGATCACCTAAACTCAACAAACCATGCCATTGTTTCAGACTTTGGTCAATTC
GGTGAATTCAAAATCCCCAAGGCTTGCTGTGTGCCGACAGAAGTGAAGTGTATCTCAATGCTCTACCTTGACGAGAACG
AAAAGGTCGTACTAAAGAACTATCAAGATATGGTTGTGGAGGGCTGCGGGTGCCGCTGA

>GgaBMP4 (Chicken; Accession numbers NM_205237, AC172371, BM426811, BU473912,
BU244511, BU473786, BU268076, BU355305, BU217696, BU256447, BX259520, BU473508 and
BU227272)

ATGATTCTCGGTAACCGAATGCTGATGGTCATCTACTATGCCAAGTCCTGCTGGGAGGTACCAACCATGCTAGCCTGAT
CCCCGAGACCCGGCAGGAAGAAAGTCGCAGAGCTTCAGGGACAAGCCGGATCCGGACGCCGCTCTGCCCAAAGCCATGAAC
TCTTGCGGGGTTTTCGAAACGACTCTGCTGCAGATGTTTGGGCTGCGAAGGCGGCCCCAGCCCAGCAAATCAGCCGTCATC
CCCAGTTACATGCTGGATCTCTACCGGCTCCAGTCCGGAGAAGAGGAGGAGAGCCTCCAGGAGATCAGCCTGCAGTACCC
GGAGCGATCGACCAGCCGGGCCAACACCGTGAGGAGCTTCCACCATGAAGAGCACCTGGAGAGCGTGCCGGGTCCCAGCG
AAGTGCCGCGGATCCGCTTTCGTCTTCAACCTCAGCAGCGTGCCGGACAACGAGGTGATCTCGTCGGCGGAGCTGCGGCTG
TACCGGGAGCAGGTGGAGGAGCCGAGCGCGGCTGGGAGAGGGGCTTCCACCGGATAAACATTTACGAAGTGATGAAGCC
GCTGTGCGGAGCGCTCGCAGGCCATTACGCGCCTGTTGGACACGCGGTTGGTGCACCACAACGTGACGCGCTGGGAGACCT
TTGATGTGAGCCCAGCCGTGATCCGGTGGACCAAGGACAAGCAGCCCAACCACGGGCTGGTGTGATCGAGGTGACCCACCTC
CACCAGGCACAGACTCATCAGGGCAAACACGTCAGGATTAGCCGATCTTTACCTCAGGGGTACGGCGGGGACTGGGCGCA
GCTCAGGCCGCTCCTGGTCACCTTCGGGCACGACGGGCGAGGCCACGCGCTGACCCGCAGGGCCCCGCCGAGCCCCAAGC
ACCAGCGTTCCCGCAAGAACAAAAAACTGCCGCCGCCACGCTCTCTATGTGGATTTTCAGCGACGTGGGTGGAAACGAT
TGGATCGTGGCCCCCGGGCTACCAGGCGTTTTACTGCCACGGGGACTGCCCTTCCCTCTGGCCGACCACCTCAACTC
CACAACCACGCCATCGTGCAGACGTTGGTCAACTCCGTCAACTCCAGCATCCCCAAGGCCTGCTGCGTGCCACGGAGC
TGAGCGCCATCTCCATGCTCTACCTGGATGAGTATGACAAGGTGGTGTGAAAAACTACCAGGAGATGGTGGTGGAGGGG
TGCGGGTGCCGCTGA

>CpbBMP2 (Painted turtle; Accession number AHGY01038458)

ATGGTGGCCGCCATCCGCTCCCTGCTAGCGCTGCTGTGTACCAGGTGCTGCTGGGCGGCTCGGCCGGGCTCATCCCGGA
GGTGGGCGCGCGCGCTTCAGCGACTCGGGCCGCGCCGCCCGCAGGAGCTGCTGAGCGAGTTTCAGCTGCGTCTGCTCA
ACATGTTCCGGCTGAAGCGGCGGCCGAGCCCCAGCAAGAACGCCGTCATCCCGCCCTACATGCTGGACCTCTACCGCCTG
CAGGCCGGCCAGCAGCTGGGCCACTCCGCCCGGGCTACCCGCTGGAGAGAGCCGCCAGCCGCGCCAACACGGTCCGGAG
CTTCCACCACGAAGAAGCTTGGGAAGAGCTCCCAAGAAGCAAGTGGGAAAACAGCACGGCGCTTCTTCTTTAATTTAACTT
CCATCCCTAACGAGGAGTTTTCTCACCTCGGCTGAACCTTCAGATTTTTCCGGGAGCAGGTGCAGGAAACCTTTGAGAACAAT
AGCAGCTACCATCACCGTATTAATATTTATGAAATTATAAAGCCAGCCACAGCCACTTCTAAGGACCCTGCCGCAAGACT
TTTGGACACCAGGTTGGTGCATCAGAATGCAAGTAAATGGGAAAGCTTTGATGTAACACCAGCTGTAATGAGGTGGATTG
CACATAGACAGCCTAATCATGGGTTTATAGTAGAGGTGGTTCACTTGGACAATGAGAGCAGTGTTCGAAGAGGCACGTT
AGGATTAGCAGGTCTTTGCATCAGGATGAAGATAGCTGGTCTCAGCTCCGGCCGTTGTTAGTAACTTTTGGCCATGATGG
CAAGGGACACTCTCTCCATAAAAAGAGAGAAACGCCAAGCAAACACAAACAGCGCAAACGCCACAAATCCAGTTGCAAAA
GACATCCTTTATATGTGGACTTCAATGACGTGGGGTGAATGACTGGATTGTTGCCCCACCAGGATATGGTGCCTTTTAC
TGCCATGGGGAATGCCCTTTTCCATTGGCAGATCACCTAAACACAACAACCATGCCATTGTTTCAGACTTTGGTCAATTC
CGTGAATTCAAAATCCCTAAGGCTTGCTGTGTTCCGACAGAAGTGAAGCGCTATTTCCATGCTCTACCTTGACGAGAACG
AAAAAGTTGTATTAAGAAGCTATCAAGATATGGTTGTGGAGGGTTGTGGGTGCCGCTAA

>CpbBMP4 (Painted turtle; Accession number XM_005295477.1)

ATGATTCTCGGTAACCGAATGCTGATGGTCATTCTGTTATGCCAAGTTCTGCTAGGAGGTACTAACCATGCCAGTTTGGAT
ACCCGAGACGGGGAGGAAGAAAGTTGGAGAACTCCAGGCTCACGCAGGATCTGGACGCCGCTCCGGGCCAAAGCCATGAAC
TCTTGCGGGGTTTTCGAGGCGAGTTTGCCTGCAGATGTTCCGGCTCCGCAGGCGGCCCCAGCCCAGCAAAGCAGCCGTCATC
CCCGCTACATGCTGGATCTCTATCGGCTGCAGTCCGGGGAAGAGGAGGAAAGCCTGCAGGACATCAGCCTGCGGTATCC
CGAGAGATCCACTAGCCGGGCCAACACCGTGAGGAGTTTCCACCATGAAGAACATCTGGAGAACCTCCCCGGGCCAGCG
ACACCCCCCGGTTTCGCTTCCCTTCAACCTCAGCAGCGTGCCGGAGAACGAGGTGATCACCTCGGCCGAGCTGCGGCTG
TACCGGGAGCAGCTGGAAGCGCGGAGCCCCGCGTGGGAACGGGGCTCGCACCGGATCAACATCTACGAAGTGATGAAGCC
CCCGCCGGCCCGCGGGCAGGTGATCACGCGGCTGCTGGACACGCGGCTGGTGCATCACAACGTGTCCCGGTGGGAGAGCT
TCGACGTGAGCCCCGCGCTCCTCCGCTGGACCCAGGACAGGCAGCCCAACCACGGGCTGGCGGTGGAGGTGACCCCGCTG
CCCCCGCCCCCGCGGGCCCCGGGAACCACGTCAGGATTAGCCGATCTTTACCTCAAGGAGACGGGGACTGGGCCAGTT
GAGGCCGCTGCTGGTCACTTTTCAGCCACGACGGCAGGGGCCACGCACTGACCCGCCGGGCCCGCCGAGCGCCAAGCACC
AGCGGCCCGCAAGAACAACAAAAAACTGTGACGCCACGCGCTATGTGGATTTTCAGCGACGTGGGTGGAAACGACTGG
ATCGTGGCCCCCGGGCTACCAGGCTTTTACTGCCACGGGGACTGCCCTTCCCTTTGGCCGACCACCTCAACTCCAC
CAACCACGCCATCGTGCAAACCTGGTGAACCTCCGTCAACGCCAGCATCCCCAAGGCCTGCTGCGTGCCACGGAGCTGA
CGCCATCTCCATGCTCTACCTGGACGAGTATGACAAAGTGGTCTGAAAAACTACCAGGAGATGGTGGTGGAGGGGTGC
GGGTGCCGTTAA

>HsaBMP2 (Human, Accession numbers NM_001200 and NT_011387)

ATGGTGGCCGGGACCCGCTGTCTTCTAGCGTTGCTGCTTCCCCAGGTCCTCTGGGCGGCGGGCTGGCCTCGTTCCGGA

GCTGGGCCGCGAGGAAGTTCGCGGGCGGCGTTCGCGGGCCGCCCTCATCCCAGCCCTCTGACGAGGTCTGAGCGAGTTTCG
AGTTGCGGCTGCTCAGCATGTTTCGGCCTGAAACAGAGACCCACCCCCAGCAGGGACGCCGTGGTGCCTTACATGCTA
GACCTGTATCGCAGGCACTCAGGTCAGCCGGGCTCACCCGCCCCAGACCACCGGTTGGAGAGGGCAGCCAGCCGAGCCAA
CACTGTGCGCAGCTTCCACCATGAAGAATCTTTGGAAGAACTACCAGAAACGAGTGGGAAAACAACCCGGAGATTCTTCT
TTAATTTAAGTTCATCCCCACGGAGGAGTTTATCACCTCAGCAGAGCTTCAGGTTTTCCGAGAACAGATGCAAGATGCT
TTAGAAAACAATAGCAGTTTCCATCACCAGAAATTAATATTTATGAAATCATAAAACCTGCAACAGCCAACTGCAAAATCCC
CGTGACCAGACTTTTGGACACCAGGTTGGTGAATCAGAATGCAAGCAGGTGGGAAAGTTTTGATGTACACCCCGCTGTGA
TGCGGTGGACTGCACAGGGACACGCCAACCATGGATTTCGTGGTGGAAAGTGGCCCACTTGGAGGAGAAAACAAGGTGTCTCC
AAGAGACATGTTAGGATAAGCAGGTCTTTGCACCAAGATGAACACAGCTGGTTCACAGATAAAGGCCATTGCTAGTAACCTT
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>HsaBMP4 (Human; Accession number NM_001202.3)

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AGCAGAAGTGGTGCCTGGGCACCTCATCACAGACTGACACAGAGACTGGTCCACCACAATGTGACACGGTGGGAAA
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CTCCATCAGACTCGGACCCACCAGGGCCAGCATGTCAGGATTAGCCGATCGTTACCTCAAGGGAGTGGGAATTGGGCCA
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CTAAGCATCACTCACAGCGGGCCAGGAAGAAGAATAAGAACTGCCGGCGCCACTCGCTCTATGTGGACTTCAGCGATGTG
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GTAGTAGAGGGATGTGGGTGCCGCTGA

>MmuBMP2 (Mouse; Accession number NM_007553.2)

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TGAGGCTGCTCAGCATGTTTGGCCTGAAGCAGAGACCCACCCCCAGCAAGGACGTGCTGGTGGCCCCCTATATGCTAGAT
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CGTGCGCAGCTTCCATCACGAAGAAGCCGTGGAGAACTTCCAGAGATGAGTGGGAAAACGGCCCGGCGCTTCTTCTTCA
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CAGACTATTGGACACCAGGTTAGTGAATCAGAACACAAGTCAAGTGGGAGAGCTTCGACGTCACCCAGCTGTGATGCGGT
GGACCACACAGGGACACACCAACCATGGGTTTTGTGGTGGAAAGTGGCCATTTAGAGGAGAACCAGGTGTCTCCAAGAGA
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>MmuBMP4 (Mouse; Accession number BC013459.1)

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