

**Table S2. Families of transcription factors involved in stress response based on Matrix Family Library Version 11.0 from MatInspector program analyzed in this work.**

| FAMILY         | FAMILY INFORMATION   | MATRIX NAME            | INFORMATION   |
|----------------|--|------------------------|---|
| <b>F\$ASG1</b> | Activator of stress genes                                      | <u>F\$ASG1.01</u>      | Fungal zinc cluster transcription factor Asg1   |
| <b>F\$BZIP</b> | Fungal basic leucine zipper family                             | <u>F\$CIN5.01</u>      | bZIP transcriptional factor of the yAP-1 family that mediates pleiotropic drug resistance and salt tolerance                  |
|                |  | <u>F\$CST6.01</u>      | Chromosome stability, bZIP transcription factor of the ATF/CREB family (ACA2)   |
|                |  | <u>F\$HAC1.01</u>      | bZIP transcription factor (ATF/CREB1 homolog) that regulates the unfolded protein response                                    |
|                |  | <u>F\$HAC1.02</u>      | bZIP transcription factor (ATF/CREB1 homolog) that regulates the unfolded protein response                                    |
|                |  | <u>F\$YAP1.01</u>      | Yeast activator protein of the basic leucine zipper (bZIP) family   |
|                |  | <u>F\$YAP1.02</u>      | Yeast activator protein of the basic leucine zipper (bZIP) family   |
| <b>F\$MREF</b> | Metal regulatory element factors                               | <u>F\$CUSE.01</u>      | Copper-signaling element, AMT1/ACE1 recognition sequence  |
| <b>F\$SKN7</b> | Skn7 response regulator of <i>S. cerevisiae</i>                | <u>F\$SKN7.01</u>      | SKN7, a transcription factor contributing to the oxidative stress response  |
| <b>F\$SXB</b>  | <i>S. cerevisiae</i> , Xhol site-binding protein I             | <u>F\$XBP1.01</u>      | <i>S. cerevisiae</i> Xhol site-binding protein I, stress-induced expression   |
|                |  | <u>F\$XBP1.02</u>      | Stress-induced transcriptional repressor  |
| <b>F\$YHSF</b> | Yeast heat shock factors                                       | <u>F\$HSF.01</u>       | Heat shock factor (yeast)   |
|                |  | <u>F\$HSF1.01</u>      | Trimeric heat shock transcription factor  |
|                |  | <u>F\$HSF1.02</u>      | Trimeric heat shock transcription factor  |
|                |  | <u>F\$MGA1.01</u>      | Heat shock transcription factor Mga1  |
| <b>F\$YNIT</b> | <i>Asperg./Neurospora</i> -activ. of genes induced by nitrogen | <u>F\$NIT2.01</u>      | Activator of nitrogen-regulated genes   |
| <b>F\$YSTR</b> | Yeast stress response elements                                 | <u>F\$GIS1.01</u>      | Glg1-2 suppressor, involved in the expression of genes during nutrient limitation, JmjC domain-containing histone demethylase |
|                |  | <u>F\$MSN2.01</u>      | Transcriptional activator for genes in multistress response   |
|                |  | <u>F\$MSN4.01</u>      | Transcriptional activator related to Msn2p, activated in stress conditions  |
|                |  | <u>F\$RPH1.01</u>      | Jumonji-like transcription factor   |
|                |  | <u>F\$STRE.01</u>      | MSN2/MSN4, STRE element, <i>S. cerevisiae</i>   |
|                |  | <u>F\$STRE.02</u>      | Stress-response element   |
|                |  | <u>F\$USV1.01</u>      | Usv (Up in StarVation), Nsf1 (nutrient and stress factor 1)   |
| <b>I\$CEBP</b> | <i>Drosophila</i> C/EBP like bZIP transcription factors        | <u>I\$SLBO.01</u>      | Slow border cells   |
| <b>I\$DCF1</b> | <i>Drosophila</i> Chorion Factor 1 /Ultraspiracle              | <u>I\$CF1.01</u>       | Chorion factor 1, homologous to retinoid X receptor   |
| <b>I\$DHSF</b> | <i>Drosophila</i> heat shock factors                           | <u>I\$HSF.01</u>       | Heat shock factor ( <i>Drosophila</i> )   |
| <b>P\$AREF</b> | Auxin response element   | <u>P\$ARE.01</u>       | Auxin Response Element  |
|                |  | <u>P\$SEBF.01</u>      | Silencing element binding factor - transcriptional repressor  |
| <b>P\$ARF3</b> | Auxin Response Factor 3  | <u>P\$ETT.01</u>       | ETTIN (Auxin Response Factor 3)   |
|                |  | <u>P\$ETT.02</u>       | ETTIN (secondary DNA binding preference)  |
| <b>P\$ERSE</b> | ER stress-response elements                                    | <u>P\$ERSE.1.01</u>    | ERSE I (ER stress-response element I)-like motif  |
| <b>P\$HEAT</b> | Heat shock factors   | <u>P\$AT3G09735.01</u> | DNA-binding protein S1FA3   |
|                |  | <u>P\$HSE.01</u>       | Heat shock element  |
|                |  | <u>P\$HSFA1A.01</u>    | <i>Arabidopsis thaliana</i> class A heat shock factor 1a  |
|                |  | <u>P\$HSFA1B.01</u>    | Heat stress transcription factor A-1b (HSF3)  |
|                |  | <u>P\$HSFA4A.01</u>    | Heat stress transcription factor A-4a (HSF21)   |
|                |  | <u>P\$HSFA6B.01</u>    | Heat stress transcription factor A-6b   |
|                |  | <u>P\$HSFB2A.01</u>    | Heat shock transcription factor B2A   |
|                |  | <u>P\$HSFB2A.02</u>    | Heat stress transcription factor B-2a (HSF6)  |
|                |  | <u>P\$HSFB2B.01</u>    | Heat stress transcription factor B-2b (HSF7)  |

|   |                        |   |
|---|------------------------|---|
|   | <u>P\$HSFB3.01</u>     | Heat stress transcription factor B-3  |
|   | <u>P\$HSFC1.01</u>     | Heat shock transcription factor C1  |
|   | <u>P\$HSFC1.02</u>     | Heat shock transcription factor C1 (secondary DNA binding preference)                             |
|   | <u>P\$HSFC1.03</u>     | Heat stress transcription factor C-1  |
| <b>V\$AHR</b> AHR-arnt heterodimers and AHR-related factors | <u>V\$AHR.01</u>       | Aryl hydrocarbon / dioxin receptor  |
|   | <u>V\$AHRARNT.01</u>   | Aryl hydrocarbon receptor / Arnt heterodimers   |
|   | <u>V\$AHRARNT.02</u>   | Aryl hydrocarbon / Arnt heterodimers, fixed core  |
|   | <u>V\$AHRARNT.03</u>   | DRE (dioxin response elements), XRE (xenobiotic response elements) bound by AHR/ARNT heterodimers |
|   | <u>V\$NXF_ARNT.01</u>  | bHLH-PAS type transcription factors NXF/ARNT heterodimer  |
| <b>V\$AP1R</b> MAF and AP1 related factors                  | <u>V\$BACH1.01</u>     | BTB/POZ-bZIP transcription factor BACH1 forms heterodimers with the small Maf protein family      |
|   | <u>V\$BACH1.02</u>     | BTB and CNC homology 1, basic leucine zipper transcription factor 1                               |
|   | <u>V\$BACH2.01</u>     | Bach2 bound TRE   |
|   | <u>V\$BACH2.02</u>     | BTB and CNC homology 1, basic leucine zipper transcription factor 2                               |
|   | <u>V\$MAFA.01</u>      | Lens-specific Maf/MafA-sites  |
|   | <u>V\$MAFB.01</u>      | MAFB/Kreisler basic region/leucine zipper transcription factor (half site)                        |
|   | <u>V\$MAFF.01</u>      | Transcription factor Maff   |
|   | <u>V\$MAFK.01</u>      | V-maf musculoaponeurotic fibrosarcoma oncogene homolog K (half site)                              |
|   | <u>V\$MAFK.02</u>      | v-maf avian musculoaponeurotic fibrosarcoma oncogene homolog K (NFE2U)                            |
|   | <u>V\$MARE.01</u>      | Maf response elements, half sites   |
|   | <u>V\$MARE.02</u>      | Binding sites for homodimers of large Maf-proteins  |
|   | <u>V\$MARE.03</u>      | Binding sites for heterodimers with small Maf-proteins  |
|   | <u>V\$MARE_ARE.01</u>  | Antioxidant response elements   |
|   | <u>V\$NFE2.01</u>      | NF-E2 p45   |
|   | <u>V\$NFE2.02</u>      | Leucine zipper protein NF-E2 (nuclear factor, erythroid-derived)                                  |
|   | <u>V\$NFE2L2.01</u>    | Nuclear factor, erythroid 2-like 2 (NFE2L2)   |
|   | <u>V\$NRL.01</u>       | Neural retinal basic leucine zipper factor (bZIP)   |
|   | <u>V\$NRL.02</u>       | Neural retinal basic leucine zipper factor (bZIP)   |
|   | <u>V\$TCF11MAFG.01</u> | TCF11/MafG heterodimers, binding to subclass of AP1 sites   |
|   | <u>V\$VMAF.01</u>      | v-Maf   |
| <b>V\$CEBP</b> Ccaat/Enhancer Binding Protein               | <u>V\$CEBP.02</u>      | CCAAT/enhancer binding protein  |
|   | <u>V\$CEBPA.01</u>     | CCAAT/enhancer binding protein alpha  |
|   | <u>V\$CEBPA.02</u>     | CCAAT/enhancer binding protein alpha  |
|   | <u>V\$CEBPB.01</u>     | CCAAT/enhancer binding protein beta   |
|   | <u>V\$CEBPB.02</u>     | CCAAT/enhancer binding protein beta   |
|   | <u>V\$CEBPD.01</u>     | CCAAT/enhancer binding protein (C/EBP), delta   |
|   | <u>V\$CEBPE.01</u>     | CCAAT/enhancer binding protein (C/EBP), epsilon   |
|   | <u>V\$CEBPE.02</u>     | CCAAT/enhancer binding protein (C/EBP), epsilon   |
|   | <u>V\$CEBPG.01</u>     | CCAAT/enhancer binding protein (C/EBP), gamma   |
| <b>V\$CHOP</b> C/EBP homologous protein (CHOP)              | <u>V\$CHOP.01</u>      | Heterodimers of CHOP and C/EBPalpha   |
|   | <u>V\$CHOP.02</u>      | Heterodimers of CHOP and C/EBPalpha   |

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|---|--|---|
|   | <u>V\$ATF.01</u>                                   | Activating transcription factor   |
|   | <u>V\$ATF.02</u>                                   | Activating transcription factor   |
|   | <u>V\$ATF1.01</u>                                  | Activating transcription factor 1   |
|   | <u>V\$ATF1.02</u>                                  | Activating transcription factor 1   |
|   | <u>V\$ATF2.01</u>                                  | Activating transcription factor 2   |
|   | <u>V\$ATF6.02</u>                                  | Activating transcription factor 6, member of b-zip family, induced by ER stress |
|   | <u>V\$BTF3.01</u>                                  | Basic leucine zipper transcription factor, ATF-like 3                           |
|   | <u>V\$CJUN ATF2.01</u>                             | c-Jun/ATF2 heterodimers   |
| <b>V\$CREB</b> cAMP-responsive element binding proteins           | <u>V\$CREB.02</u>                                  | cAMP-responsive element binding protein   |
|   | <u>V\$CREB.03</u>                                  | cAMP-response element-binding protein   |
|   | <u>V\$CREB1.01</u>                                 | cAMP-responsive element binding protein 1                                       |
|   | <u>V\$CREB1.02</u>                                 | cAMP-responsive element binding protein 1                                       |
|   | <u>V\$CREB2.01</u>                                 | cAMP-responsive element binding protein 2                                       |
|   | <u>V\$CREB2CJUN.01</u>                             | CRE-binding protein 2/c-Jun heterodimer   |
|   | <u>V\$CREB3.01</u>                                 | cAMP responsive element binding protein 3, dimeric binding site                 |
|   | <u>V\$CREB3L2.01</u>                               | cAMP responsive element binding protein 3-like 2, BBF2H7, dimeric binding site  |
|   | <u>V\$E4BP4.01</u>                                 | E4BP4, bZIP domain, transcriptional repressor                                   |
|   | <u>V\$JUNDM2.01</u>                                | Jun dimerization protein 2  |
|   | <u>V\$TAXCREB.01</u>                               | Tax/CREB complex  |
|   | <u>V\$TAXCREB.02</u>                               | Tax/CREB complex  |
|   | <u>V\$XBP1.01</u>                                  | X-box-binding protein 1   |
|   |  | <u>V\$ATF6.01</u>   |
| <b>V\$EBOX</b> E-box binding factors                              | <u>V\$CMYC.01</u>                                  | Myelocytomatosis oncogene (c-myc proto-oncogene)                                |
|   | <u>V\$CMYC.02</u>                                  | Myelocytomatosis oncogene (c-myc proto-oncogene)                                |
|   | <u>V\$MAX.01</u>                                   | Max/Max dimer   |
|   | <u>V\$MAX.02</u>                                   | MYC associated factor X   |
|   | <u>V\$MAX.03</u>                                   | MYC associated factor X   |
|   | <u>V\$MNT.01</u>                                   | MAX binding protein   |
|   | <u>V\$MYCMAX.01</u>                                | c-Myc/Max heterodimer   |
|   | <u>V\$MYCMAX.02</u>                                | c-Myc/Max heterodimer   |
|   | <u>V\$MYCMAX.03</u>                                | MYC-MAX binding sites   |
|   | <u>V\$NMYC.01</u>                                  | N-Myc   |
|   | <u>V\$NMYC.02</u>                                  | v-myc myelocytomatosis viral related oncogene, neuroblastoma derived            |
|   | <u>V\$USF.01</u>                                   | Upstream stimulating factor   |
|   | <u>V\$USF.02</u>                                   | Upstream stimulating factor   |
|   | <u>V\$USF.03</u>                                   | Upstream stimulating factor   |
|   | <u>V\$USF.04</u>                                   | Upstream stimulating factor 1/2   |
|   | <u>V\$USF1.01</u>                                  | Upstream stimulating factor 1   |
|   | <u>V\$USF1.02</u>                                  | Upstream stimulating factor 1   |
| <u>V\$USF2.01</u>   | Upstream transcription factor 2, c-fos interacting |   |
| <b>V\$FXRE</b> Farnesoid X - activated receptor response elements | <u>V\$FXRE.01</u>                                  | Farnesoid X - activated receptor (RXR/FXR dimer), IR1 sites                     |

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| <b>V\$GMEB</b> Glucocorticoid modulatory element binding proteins | <u>V\$GMEB.01</u>     | Glucocorticoid modulatory element binding protein   |
|   | <u>V\$ARE.01</u>      | Androgene receptor binding site, IR3 sites  |
|   | <u>V\$ARE.02</u>      | Androgene receptor binding site, IR3 sites  |
|   | <u>V\$ARE.03</u>      | Androgene receptor binding site, IR3 sites  |
|   | <u>V\$ARE.04</u>      | Androgene receptor binding site, IR3 sites  |
| <b>V\$GREF</b> Glucocorticoid responsive and related elements     | <u>V\$GRE.01</u>      | Glucocorticoid receptor, C2C2 zinc finger protein binds glucocorticoid dependent to GREs, IR3 sites   |
|   | <u>V\$GRE.02</u>      | Glucocorticoid receptor, IR3 sites  |
|   | <u>V\$GRE.03</u>      | Glucocorticoid receptor, IR3 sites  |
|   | <u>V\$MRE.01</u>      | Mineralocorticoid receptor response element   |
|   | <u>V\$PRE.01</u>      | Progesterone receptor binding site, IR3 sites   |
| <b>V\$HEAT</b> Heat shock factors                                 | <u>V\$HSF1.01</u>     | Heat shock factor 1   |
|   | <u>V\$HSF1.02</u>     | Heat shock factor 1   |
|   | <u>V\$HSF1.03</u>     | Heat shock factor 1   |
|   | <u>V\$HSF1.04</u>     | Heat shock factor 1   |
|   | <u>V\$HSF1.05</u>     | Heat shock factor 1   |
|   | <u>V\$HSF2.01</u>     | Heat shock factor 2   |
|   | <u>V\$HSF2.02</u>     | Heat shock factor 2   |
|   | <u>V\$HSF2.03</u>     | Heat shock factor 2   |
| <b>V\$IRFF</b> Interferon regulatory factors                      | <u>V\$IRF1.01</u>     | Interferon regulatory factor 1  |
|   | <u>V\$IRF2.01</u>     | Interferon regulatory factor 2  |
|   | <u>V\$IRF2.02</u>     | Interferon regulatory factor 2  |
|   | <u>V\$IRF3.01</u>     | Interferon regulatory factor 3 (IRF-3)  |
|   | <u>V\$IRF4.01</u>     | Interferon regulatory factor (IRF)-related protein (NF-EM5, PIP, LSIRF, ICSAT)                        |
|   | <u>V\$IRF4.02</u>     | Interferon regulatory factor 4  |
|   | <u>V\$IRF4.03</u>     | Interferon regulatory factor 4  |
|   | <u>V\$IRF5.01</u>     | Interferon regulatory factor 5  |
|   | <u>V\$IRF6.01</u>     | Interferon regulatory factor 6  |
|   | <u>V\$IRF7.01</u>     | Interferon regulatory factor 7 (IRF-7)  |
|   | <u>V\$IRF8.01</u>     | Interferon consensus sequence binding protein 1, interferon regulatory factor 8, dimeric binding site |
|   | <u>V\$ISGF3G.01</u>   | Interferon-stimulated transcription factor 3, gamma (IRF9)  |
|   | <u>V\$ISRE.01</u>     | Interferon-stimulated response element  |
|   | <u>V\$ISRE.02</u>     | Interferon-stimulated response element  |
| <b>V\$MTF1</b> Metal induced transcription factor                 | <u>V\$MTF-1.01</u>    | Metal transcription factor 1, MRE   |
|   | <u>V\$MTF-1.02</u>    | Metal-regulatory transcription factor 1   |
| <b>V\$NFAT</b> Nuclear factor of activated T-cells                | <u>V\$NFAT.01</u>     | Nuclear factor of activated T-cells   |
|   | <u>V\$NFAT5.01</u>    | Nuclear factor of activated T-cells 5   |
|   | <u>V\$NFAT5.02</u>    | Nuclear factor of activated T-cells 5   |
|   | <u>V\$NFATC1.01</u>   | Nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1, dimeric binding site       |
| <b>V\$NGRE</b> "Negative" glucocorticoid response elements        | <u>V\$IR1_NGRE.01</u> | Repressive binding sites for glucocorticoid receptor (IR1)  |
|   | <u>V\$IR2_NGRE.01</u> | Repressive binding sites for glucocorticoid receptor (IR2)  |
|   | <u>V\$PPARA.01</u>    | PPAR/RXR heterodimers, DR1 sites  |

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| <b>V\$PERO</b> Peroxisome proliferator-activated receptor            | <u>V\$PPARG.02</u>    | Peroxisome proliferator-activated receptor gamma                              |
|  | <u>V\$PPARG.03</u>    | Peroxisome proliferator-activated receptor gamma, DR1 sites                   |
|  | <u>V\$PPAR_RXR.01</u> | PPAR/RXR heterodimers, DR1 sites  |
|  | <u>V\$PPAR_RXR.02</u> | PPAR/RXR heterodimers, DR1 sites  |
| <b>V\$PPAR</b> Peroxisome proliferator activated receptor homodimers | <u>V\$PPARG.01</u>    | Pal3 motif, bound by a PPAR-gamma homodimer, IR3 sites                        |
|  | <u>V\$REV-ERBA.01</u> | Orphan nuclear receptor rev-erb alpha (NR1D1)                                 |
|  | <u>V\$REV-ERBA.02</u> | Orphan nuclear receptor rev-erb alpha (NR1D1), monomer binding site           |
|  | <u>V\$REV-ERBA.03</u> | Orphan nuclear receptor rev-erb alpha (NR1D1), homodimer DR2 binding site     |
| <b>V\$RORA</b> v-ERB and RAR-related orphan receptor alpha           | <u>V\$RORA.01</u>     | RAR-related orphan receptor alpha   |
|  | <u>V\$RORA.02</u>     | RAR-related orphan receptor alpha, homodimer DR5 binding site                 |
|  | <u>V\$RORA.03</u>     | RAR-related orphan receptor alpha, homodimer DR2 binding site                 |
|  | <u>V\$RORA1.01</u>    | RAR-related orphan receptor alpha1  |
|  | <u>V\$RORA2.01</u>    | RAR-related orphan receptor alpha2  |
|  | <u>V\$ROGAMMA.01</u>  | RAR-related orphan receptor gamma   |
|  | <u>V\$VERBA.01</u>    | vErbA, viral homolog of thyroid hormone receptor alpha1                       |
|  | <u>V\$CAR_RXR.01</u>  | Constitutive androstane receptor / retinoid X receptor heterodimer, DR4 sites |
|  | <u>V\$LXRE.01</u>     | Nuclear receptor involved in the regulation of lipid homeostasis, DR4 element |
|  | <u>V\$LXRE.02</u>     | Highly conserved DR1 element selected by LXRbeta/RXR heterodimers             |
|  | <u>V\$PXR_RXR.01</u>  | Pregnane X receptor / retinoid X receptor heterodimer, DR4 sites              |
|  | <u>V\$RARA.01</u>     | Retinoic acid receptor alpha, homodimer DR4 binding site                      |
|  | <u>V\$RARG.01</u>     | Retinoic acid receptor gamma, homodimer DR2 binding site                      |
|  | <u>V\$RAR_RXR.01</u>  | Retinoic acid receptor / retinoid X receptor heterodimer, DR1 sites           |
|  | <u>V\$RAR_RXR.02</u>  | Retinoic acid receptor / retinoid X receptor heterodimer, DR2 sites           |
|  | <u>V\$RAR_RXR.03</u>  | Retinoic acid receptor / retinoid X receptor heterodimer, DR5 sites           |
| <b>V\$RXRF</b> RXR heterodimer binding sites                         | <u>V\$RXRA.01</u>     | Retinoid X receptor alpha homodimer, DR1 sites                                |
|  | <u>V\$RXR_RXR.01</u>  | Retinoid X receptor homodimer, DR1 sites                                      |
|  | <u>V\$THR.01</u>      | THR/RXR heterodimer and THR homodimer DR4 binding sites                       |
|  | <u>V\$THRA.01</u>     | Thyroid hormone receptor, alpha (ER4 - everted repeat, spacer 4)              |
|  | <u>V\$THRB.01</u>     | Thyroid hormone receptor, beta (ER4 - everted repeat, spacer 4)               |
|  | <u>V\$THRB.02</u>     | Thyroid hormone receptor, beta (ER5 - everted repeat, spacer 5)               |
|  | <u>V\$THRB.03</u>     | Thyroid hormone receptor, beta (ER6 - everted repeat, spacer 6)               |
|  | <u>V\$VDR_RXR.01</u>  | VDR/RXR Vitamin D receptor RXR heterodimer, DR3 sites                         |
|  | <u>V\$VDR_RXR.03</u>  | Bipartite binding site of VDR/RXR heterodimers, DR1 sites                     |
|  | <u>V\$VDR_RXR.04</u>  | Bipartite binding site of VDR/RXR heterodimers, DR3 sites                     |
|  | <u>V\$VDR_RXR.05</u>  | Bipartite binding site of VDR/RXR heterodimers, DR4 sites                     |
|  | <u>V\$VDR_RXR.06</u>  | Bipartite binding site of VDR/RXR heterodimers, DR5 sites                     |