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|---------|-----|---|-----|
| NnAOX1a | 1 | MMNSK-LAALLLKQLGSATVIRIVTMG---PLNG-----ITTESSCFLHAS | 41 |
| NnAOX1b | 1 | MMKSGKMGVPI.TMQIAPRI.FSTATTS---RI.VTSEP--I.I.TGTTSTFLYAA | 45 |
| AtAOX1a | 1 | MMITRGGAKAAKSLLVAAAGPRLFSTV---RTVSSHE--ALSASHILKPGV | 45 |
| LeAOX1a | 1 | MMTRG-ATRMTRVVMGHMGPRYFSTTVLRNNPGTGVVGGVAAGLLHGLPA | 49 |
| LeAOX1b | 1 | MNRNAAM-KISGLLM-----RQLRGEFLPRGGM---VQIR-- | 31 |
| NtAOX1 | 1 | MMTRG-ATRMTRTVLGHMGPRYFSTAI.FRNDAGTGVMSGAAVF-MHGVP | 48 |
| VuAOX1 | 1 | MMMSRSCGN-----RVANAV---MLVAK----GLSCE-----V | 26 |
| | | | |
| NnAOX1a | 42 | GPVVPGRRTWIRFSCV-LGV--RNGSTSALNNKEEKEKGVRTSSTVGGANR | 88 |
| NnAOX1b | 46 | AARTSVAS--IRLPVL-GV--RNGSTGALGGDEQTRNGLQTDSTGGTSDS | 90 |
| AtAOX1a | 46 | TSAWI-----WTRAPT-I-G-GMRFASITITLGEKTPMKEEDANQKKTENEST | 89 |
| LeAOX1a | 50 | NPSKFAVAVTWRHFSAMGS--RSASTAALNDKQOEKESDCKKVENTATAT | 97 |
| LcAOX1b | 32 | ---II-----WS-----N---MNTSSKTKEEQKTIHQPSIITDA | 57 |
| NtAOX1 | 49 | NPSEKAVVTWVRHFPVMGS--RSAMSMALNDKQHDK----K-AENGSA | 91 |
| VuAOX1 | 27 | GGA-----RAF-Y-GGGVRSSESTL.VI.PEKEKMEK-----KVGDG-- | 58 |
| | | | |
| NnAOX1a | 89 | PEDKMI-----V-SYWGMPANLTKKDGSEWKWNSFRPWETYKADLS | 129 |
| NnAOX1b | 91 | PSDKPKPI-----V-SYWGLVPSKVTKEDGTVWRWNSFRPWETYQADLS | 133 |
| AtAOX1a | 90 | CGDAACGNKGDGKIASYWGVEPNKIKEDGSEWKWNSFRPWETYKADIT | 139 |
| LeAOX1a | 98 | AAVNG-GVG---KSVVSYWGVFPPSKATKPDGTEWKWNSFRPWETYADMS | 143 |
| LeAOX1b | 58 | TNAAG-DKAK--KTV-SYWGVDPKTSKEDGTPWKWNSFRPWETYADTS | 103 |
| NtAOX1 | 92 | TGGDGGDE---KSVVSYWGVQPSKVIKEDGTEWKWNSFRPWETYKADLS | 138 |
| VuAOX1 | 59 | -----GNKFKQ-KGTVSYWGVFPPSKITKIDGTEWKWNSFRPWETYKADVS | 101 |
| * | | | |
| NnAOX1a | 130 | IDLKKHHSVPTFMDKLAYWTVKALRYPTDILFQNRVYCCRAMLETVAAVP | 179 |
| NnAOX1b | 134 | IDLKKHHEPNKFLDKMAYWTVKTLRYPTDLEFQRRYCCRAMLETVAAVP | 183 |
| AlAOX1a | 140 | IDLKKHHPVPTFLDRIAYWTVKSLRWPTDLEFQRRYCCRAMLETVAAVP | 189 |
| LeAOX1a | 144 | IDLTKHHAPVTFLDKFAWTVKILRFPTDVFQRRYCCRAMLETVAAVP | 193 |
| LeAOX1b | 104 | IDVFKHHMPTNFMDKFAWTVQSLKYPTYL.FQRRHMCNAMLETVAAVP | 153 |
| NtAOX1 | 139 | IDLTKHHAPTFLDKFAWTVKSLRYPTDLEFQRRYCCRAMLETVAAVP | 188 |
| VuAOX1 | 102 | IDLNKHHAPTFLDKMAI.WTVKTLRYPTDLEFQRRYCCRAMLETVAAVP | 151 |
| * = | | | |
| NnAOX1a | 180 | GMVGGMLLHCKSLRRFEHSGGWIKTLLLEAENERMHLMTFMEVSPKWYE | 229 |
| NnAOX1b | 184 | GMVAGMLLHCKSLRRFEHSGGWIKALLEEAENERMHLMTFMEVSPKWYE | 233 |
| AlAOX1a | 190 | GMVGGMLLHCKSLRRFEQSGGWIKALLEEAENERMHLMTFMEVAKPKWYE | 239 |
| LeAOX1a | 194 | GMVGGMLLHCKSLRRFEQSGGWIKALLEEAENERMHLMTFMEVAKPNVYE | 243 |
| LeAOX1b | 154 | GMVGGMLLHCKSLRRFEHSGGWIKALLEEAENERMHLMTFI.ELSNPKWYE | 203 |
| NtAOX1 | 189 | GMVGGMLLHCKSLRRFEQSGGWIKTLLLEAENERMHLMTFMEVAKPNWYE | 238 |
| VuAOX1 | 152 | GMVAGMLLHCKSLRRFEHSGGWIKALLEEAENERMHLMTFMEVAKPKWYE | 201 |
| = = | | | |
| NnAOX1a | 230 | RALVAVQGVFFNTYFLGYLISPRFAHRVGYLEEEA.IHSYTEFLKELDK | 279 |
| NnAOX1b | 234 | RALVETVQGVFFNAYFLAYLISPKLAHRVGYLEEEA.IHSYTEFLKELDK | 283 |
| AtAOX1a | 240 | RALVITVQGVFFNAYFLGYLISPKFAHRVGYLEEEA.IHSYTEFLKELDK | 289 |
| LeAOX1a | 244 | RALVFAVQGVFFNAYFAAYLISPKLAHRVGYLEEEA.VHSYTEFLKELDN | 293 |
| LeAOX1b | 204 | RALVFAVQGVFFNAYFIAYLISP.KLAHRVGYLEEEA.VNSYTEFLIDIEK | 253 |
| NtAOX1 | 239 | RALVFAVQGVFFNAYFVTYLLSP.KLAHRVGYLEEEA.IHSYTEFLKELDK | 288 |
| VuAOX1 | 202 | RALVITVQGVFFNAYFLGYMISP.KFAHRVGYLEEEA.IHSYTEFLKELDK | 251 |
| = | | | |
| NnAOX1a | 280 | GNTQNV.PAPAIAVDYWQLP.DS.TL.RDVVMV.VRADEA.HHRD.VNH.FASDI.HD | 329 |
| NnAOX1b | 284 | GNIEN.V.PAPAIAIDYWILP.DS.TL.RDVVL.V.VRADEA.HHRD.VNH.FASDI.HF | 333 |
| AtAOX1a | 290 | GNIEN.V.PAPAIAIDYWR.LPADATL.RDVVMV.VRADEA.HHRD.VNH.FASDI.HY | 339 |
| LeAOX1a | 294 | GNTFN.V.PAPAIAIDYWR.LPKDATL.RDVVI.V.VRADEA.HHRD.VNH.YASDI.HY | 343 |
| LeAOX1b | 254 | GLEFN.V.PAPAIAIDYWR.LPADATL.RDVVT.V.VRADEA.HHRD.LNH.FASDI.QC | 303 |
| NtAOX1 | 289 | GNTFN.V.PAPAIAIDYCR.LPKDSTL.I.DVVT.V.VRADEA.HHRD.VNH.FASDI.HY | 338 |
| VuAOX1 | 252 | GNIEN.V.PAPAIAIDYWQLP.DS.TL.RDVVT.V.VRADEA.HHRD.VNH.FASDI.HY | 301 |
| = = | | | |
| NnAOX1a | 330 | QGYELKESFAPLGYH | 344 |
| NnAOX1b | 334 | QGQELRET.PAPIGYH | 348 |
| AtAOX1a | 340 | QGRELKEAP.PAPIGYH | 354 |
| LeAOX1a | 344 | QGQQLKDS.PAPIGYH | 358 |
| LeAOX1b | 304 | QGH.LKGY.PAPIGYH | 318 |
| NtAOX1 | 339 | QGQQLKDS.PAPIGYH | 353 |
| VuAOX1 | 302 | QGRELREAA.PAPIGYH | 316 |

Supplemental Figure S1. Sequence alignment of NnAOX1a, NnAOX1b and AOX1 proteins from other dicot species. Bold characters highlight residues conserved across all of the AOX sequences in the alignment. The putative structural features are shown as described in the legend of Fig. 3. Abbreviations and data sources: AtAOX1a, *Arabidopsis thaliana* AOX1a (NP_188876); LeAOX1a, *Lycopersicon esculentum* AOX1a (AAK58482); LeAOX1b, *L. esculentum* AOX1b (AAK58483); NtAOX1, *Nicotiana tabacum* AOX1 (AAC60576); VuAOX1, *Vigna unguiculata* AOX1 (AAZ09196).