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| EcFAAL (A0A0H2VDD9): Cloned as a hexahistidine-tagged protein fused to SUMO tag at the N-terminus5' GCAGCCATATGTCTAATAAAATCTTTACGCATTCCC 3'5' CCAGACTCGAGTTATGCCAGGGATTCCTGCACATTA 3' |
| Canonical pocket mutants of EcFAAL1. A253G EcFAAL5' CTCAGGATTTTGGCATGCGTCCTCTGCAATGGC 3'5' AGAGGACGCATGCCAAAATCCTGAGTGCGCAAA 3'2. F275A EcFAAL5' GTTGCGCCGCCGGCGGGCTATGAATTGTGCCAGCG 3'5' CAATTCATAGCCCGCCGGCGGCGCAACGGAAACGG 3'3. M227A5' TTCTACCATGATGCGGGACTGGTCGGCTTTCTCC 3'5' CCGACCAGTCCCGCATCATGGTAGAAAGGCAGCC 3'4. ΔFSH (DFAM)5'GCTTTCAGTAGATTATTTGCGCACTCAGCGTCCTCTGCAATGGCTTAAATTGATCAGTAAAAATC 3'5' CTGATCAATTTAAGCCATTGCAGAGGACGCTGAGTGCGCAAATAATCTACTGAAAGCTGCGTGGC 3'5. ΔFSI5' GGTTGTGGTTAACGAAGTGGATCCGGGTGCAGAGACACGCGCCGTATC 3'5' GCGTGTCTCTGCACCCGGATCCACTTCGTTAACCACAACCCCGGAGGC 3' |
| Alternative pocket mutants of EcFAAL1. T83F EcFAAL5' CTGATTGCCGAATTTAGTAGCGAGTTCGTAGAGGC 3'5' GAACTCGCTACTAAATTCGGCAATCAGTGCCACGC 3'2. T83R EcFAAL5' CTGATTGCCGAACGCAGTAGCGAGTTCGTAGAGGC 3'5' GAACTCGCTACTGCGTTCGGCAATCAGTGCCACGC 3'3. P107F5' CCGTTGGCGATTTTTATGGGCGTTGGTCAGCGGGA 3'5' ACCAACGCCCATAAAAATCGCCAACGGGACGGCGA 3'4. P107R5' CGTTGGCGATTCGCATGGGCGTTGGTCAGCGGGA 3'5' ACCAACGCCCATGCGAATCGCCAACGGGACGGCG 3'5. P107L5' CGTTGGCGATTCTGATGGGCGTTGGTCAGCGGGA 3'5' ACCAACGCCCATCAGAATCGCCAACGGGACGGCG 3'6. T252F5' GTCTCCTGGCTGTTTTTCTACCATGATATGGGAC 3'5' TCATGGTAGAAAAACAGCCAGGAGACGCAGCGGT 3'7. T252R5' TCTCCTGGCTGCGCTTCTACCATGATATGGGACT 3'5' ATCATGGTAGAAGCGCAGCCAGGAGACGCAGCGG 3' |
| EcACP (A0A2X1NC35): Cloned as a hexahistidine-tagged protein at the C-terminus5' GCAGCCATATGGTAAATCGTGAAATAGTAATG 3'5' GTGGTGCTCGAGTTTATTCTCCAGCCATGG 3' |
| S39A EcACP (apo mutant)5' CAACGATCTTGGCCTGGAGGCGATCAAAGTGATGGATCTCTTAATGATGCTGGAAG 3'5' CATCATTAAGAGATCCATCACTTTGATCGCCTCCAGGCCAAGATCGTTGACGAGATC 3' |

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| MsFAAL32 (A0R618): Cloned as a hexahistidine-tagged protein fused to SUMO tag at the N-terminus5' GCGTCTGAGCTCATGCCGTTCCACAATCCGTTCATC 3'5' GTGGCGGCCGCTCTATTAGTCGGTGG 3' |
| Canonical pocket mutants of MsFAAL321. A253G MsFAAL32

5' CCGGCCGCGTTCGCGCGTCGCCCCGAGCGCTGGATC 3'5' GCTCGGGGCGACGCGCGAACGCGGCCGGGGTCATGA 3'1. F284A MsFAAL32

5' GGTGGCCCCGAACGCTGCGTTCGACCACGCCGCG 3'5' CGTGGTCGAACGCAGCGTTCGGGGCCACCGAGAT 3'1. M233A MsFAAL32

5' TTCTTCCACGACGCGGGTCTGATCACCGCGCTGC 3'5' GTGATCAGACCCGCGTCGTGGAAGAACGGCAGCC 3'1. ΔFSH MsFAAL32

5' CCTTCATGACCCCGGCCCGCCCCGAGCGCTGGATCCGCG 3'5' CCAGCGCTCGGGGCGGGCCGGGGTCATGAAGGTGAAGTAG 3'1. ΔFSI MsFAAL32

5' CCGAAGATCATCACGGTCGACGACGCCGATTCGCCCAAGGCCGTC 3'5' CTTGGGCGAATCGGCGTCGTCGACCGTGATGATCTTCGGCTCTTCC 3' |
| Alternative pocket mutants of MsFAAL321. P85F MsFAAL325' GCCATCCTGTGTTTTCAGAACCTCGATTACCTGGT 3'5' ATCGAGGTTCTGAAAACACAGGATGGCCACACGGT 3'2. P85R MsFAAL325' CCATCCTGTGTCGCCAGAACCTCGATTACCTGG 3'5' TCGAGGTTCTGGCGACACAGGATGGCCACACGG 3'3. P110F MsFAAL325' CCGCTGTTCGATTTTTCCGAGCCCGGCCACGTC 3'5' CCGGGCTCGGATTTATCGAACAGCGGCACCGC 3'4. P110R MsFAAL325' CCGCTGTTCGATCGCTCCGAGCCCGGCCACGTC 3'5' CCGGGCTCGGAGCGATCGAACAGCGGCACCGC 3'5. P113F MsFAAL325' GATCCGTCCGAGTTTGGCCACGTCGGCCGCCTGCA 3'5' GCCGACGTGGCCAAACTCGGACGGATCGAACAGCG 3'6. P113R MsFAAL325' GCTGTTCGATCCGTCCGAGCGCGGCCACGTCGGCCGCCTGC 3'5' GCCGACGTGGCCGCGCTCGGACGGATCGAACAGCGGCACCG 3'7. P253F MsFAAL325' CACCTTCATGACCTTTGCCGCGTTCGTCCGTCGC 3'5' CGGACGAACGCGGCAAAGGTCATGAAGGTGAAGTA 3'8. P253R MsFAAL325' CCTTCATGACCCGCGCCGCGTTCGTCCGTCGCCC 3'5' GACGAACGCGGCGCGGGTCATGAAGGTGAAGTAG 3' |
| MsPKS131-1042 (A0R617): Residues 1-1042 (excludes the terminal ACP and thioesterase domains) wascloned as a hexahistidine-tagged protein as a GFP fusion at the C-terminus5' GAGATCATATGACCGTCAACGAGATGCGG 3'5' GCACCAGCTAGCGAACAGCGTGCGGAAGTCCAG 3' |
| S38A MsPKS131-1042 (apo mutant)5' CGAACTCGGCCTGTCCGCGCGCGATGCGGTCGCGATGGCCAGC 3'5' CATCGCGACCGCATCGCGCGCGGACAGGCCGAGTTCGACCATCGG 3' |

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| MxFAAL (Q1CXX0): Cloned as a hexahistidine-tagged protein at the N-terminus5' GCGGAATTCCATATGAAGGGCGCTGGTTCGCGACTG 3'5' GCGAAGCTTAGATCTCGCCGTGCTCGGCCCCACG 3' |
| Canonical pocket mutants of MxFAAL1. L256G MxFAAL5' GATTCCCCCCGAGGCCTTCGGCGCACGGCCCGCGTTGTGGCTCCG 3'5' CAACGCGGGCCGTGCGCCGAAGGCCTCGGGGGGAATCAGCACCAG 3'2. F279A MxFAAL5' CCCGCGCCGAACGCGGCCTATGGCCTGTGTTTGAAG 3'5' ACAGGCCATAGGCCGCGTTCGGCGCGGGAGAGATG 3'3. M231A MxFAAL5' CTGTACCACGACGCGGGGCTCATCGGCTGTCTGC 3'5' CCGATGAGCCCCGCGTCGTGGTACAGCGGCACCG 3'4. ΔFSH MxFAAL (AFLA)5' GTGCTGATTCCCCCCGAGCGGCCCGCGTTGTGGCTCCGCGC 3'5' GCCACAACGCGGGCCGCTCGGGGGGAATCAGCACCAGGCTTC 3'5. ΔFSI MxFAAL5' CGCGCTGGGCGTGGACGGTTCGCGTGAGTTGGTGAGCGTGGGC 3'5' CTCACCAACTCACGCGAACCGTCCACGCCCAGCGCGCGCGGCC 3' |
| Alternative pocket mutants of MxFAAL1. T83F MxFAAL5' GTTGCTGCTGCCCTTTTCGCCGGCCTTCATGGATGC 3'5' GAAGGCCGGCGAAAAGGGCAGCAGCAACGCCACCC 3'2. T83R MxFAAL5' GTTGCTGCTGCCCCCGTCGCCGGCCTTCATGGATG 3'5' GAAGGCCGGCGACGGGGGCAGCAGCAACGCCACCCG 3'3. P106F MxFAAL5' GTGCCGCTGTACTTTCCGGTGCGGCTGGGGCGACTG 3'5' CCAGCCGCACCGGAAAGTACAGCGGCACCGGCACCG 3'4. P106R MxFAAL5' GTGCCGCTGTACCGCCCGGTGCGGCTGGGGCGACTG 3'5' CCAGCCGCACCGGGCGGTACAGCGGCACCGGCACC 3'5. P107F MxFAAL5' CCGCTGTACCCGTTTGTGCGGCTGGGGCGACTGGA 3'5' CCCCAGCCGCACAAACGGGTACAGCGGCACCGGCA 3'6. P107R MxFAAL5' CGCTGTACCCGCGCGTGCGGCTGGGGCGACTGGA 3'5' CCCCAGCCGCACGCGCGGGTACAGCGGCACCGGC 3'7. P252F MxFAAL5' GTGCTGATTCCCTTTGAGGCCTTCCTCGCACGGCC 3'5' GCGAGGAAGGCCTCAAAGGGAATCAGCACCAGGCTTCCCGGGTAG 3'8. P252R MxFAAL5' GCCTGGTGCTGATTCCCCGCGAGGCCTTCCTCGCACGGCCCGC 3'5' GTGCGAGGAAGGCCTCGCGGGGAATCAGCACCAGGCTTCCCGGG 3' |
| MxACP (A0R617): Cloned as a hexahistidine-tagged protein at the C-terminus5' GCGGAATTCCATATGACGGAGATTCATCGCATCGTCAC 3'5' GCGGGATCCGTCGCGAACCAGCGCCCTTCA 3' |
| S38A MxACP (apo mutant)5' GGACCTCCAGTTGGACGCGCTGGGCCTCACGGTGCTGGCGGTGGG 3'5' AGCACCGTGAGGCCCAGCGCGTCCAACTGGAGGTCCCGCACCAG 3' |

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| RsFAAL (Q8XRP4): Cloned as a hexahistidine-tagged protein fused to SUMO-tag at the N-terminus5' CCGAATGAGCTCATGACCGCCAGTCGTGCCG 3'5' AGCGGTCTCGAGTTAGGCAACCGGTTCCGGTTCC 3' |
| Canonical pocket mutants of RsFAAL1. I241G RsFAAL:5' CTGCTGAGTCCGCTGCTGTTTGGCCAGAAACCGGTTCGTTGGCTGCGTCTGATTAG 3'5' CAGCCAACGAACCGGTTTCTGGCCAAACAGCAGCGGACTCAGCAGGGTAATCGG 3'2. F264A RsFAAL5' CACCAGCGGTGGCCCGAATGCGGGTTATCAGGCCTGTGTGGAACGCG 3'5' CACACAGGCCTGATAACCCGCATTCGGGCCACCGCTGGTGGTAATGCG 3'3. M261A RsFAAL5' GTGGCTGCCTCCGTATCATGATGCGGGCCTGATTGGCGGCGTTCTGAGTCC 3'5' GAACGCCGCCAATCAGGCCCGCATCATGATACGGAGGCAGCCACACCATGCC 3'4. ΔFSH RsFAAL (LFIQ)5' GACGCAGCCAACGAACCGGTTTCAGCGGACTCAGCAGGGTAATCGGA 3'5' CCCTGCTGAGTCCGCTGAAACCGGTTCGTTGGCTGCGTCTGATTAG 3'5. ΔFSI RsFAAL5' GGCGCCGGTTATAAAGTGCTGTTTCGCGATGCAGTTAGCTGTGGCAGTGCAC 3'5' CCACAGCTAACTGCATCGCGAAAGCACTTTATAACCGGCGCCGCGGGCAC 3' |
| Alternative pocket mutants of RsFAAL1. A71F RsFAAL5' GAACGTGTGCTGATTCTGTGTCGCGTGGGTGAAGAATATACCAGCGTTTTCTTTGC 3'5' CGCTGGTATATTCTTCACCCACGCGACACAGAATCAGCACACGTTCGCGCTGCA 3'2. A71R RsFAAL5' 3'5' 3'3. P95F RsFAAL5' GTTGCCGTTCCGTGTACCTTTCTGCGCGGCATGCGCCATCGCAC 3'5' GGCGCATGCCGCGCAGAAAGGTACACGGAACGGCAACTGCACCGG 3'4. P95R RsFAAL5' CAGTTGCCGTTCCGTGTACCCGCCTGCGCGGCATGCGCCATCGCAC 3'5' GCGCATGCCGCGCAGGCGGGTACACGGAACGGCAACTGCACCGGCC 3'5. P237F RsFAAL5' GTTATCCGATTACCCTGCTGAGTTTTCTGCTGTTTATTCAGAAACCGGTTCGTTGGC 3'5' CCGGTTTCTGAATAAACAGCAGAAAACTCAGCAGGGTAATCGGATAACCGGTATAA 3'6. P237R RsFAAL5' GTTATCCGATTACCCTGCTGAGTCGCCTGCTGTTTATTCAGAAACCGGTTCGTTGGC 3'5' CCGGTTTCTGAATAAACAGCAGGCGACTCAGCAGGGTAATCGGATAACCGGTATAA 3' |
| RsACP (Q8XRP0)Cloned as a hexahistidine-tagged protein at the C-terminus5' GAAGGAGCATATGAACCAGCCGCCGAG 3'5' GAAGTACCTCGAGTGCTTCACTACCGG 3' |
| S48A RsACP (apo mutant)5' GCCGATCATGGCGTTGATGCGATGATTGCCATTGTTATGAGTGGTGACCTGAGC3'5' CACCACTCATAACAATGGCAATCATCGCATCAACGCCATGATCGGCAAAGGTGG 3' |

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| MtFACL13 (P9WQ37): Cloned as a hexahistidine-tagged protein at the N-terminus5' CATCATCACCACCATCACAAGAACATTGGCTGGATGCTCAGAC 3'5' GTGGCGGCCGCTCTATTACTTCGGCACCGTCGCCGAATAC 3' |
| Canonical pocket mutants of MtFACL131. A253F MtFACL135' GGTGGCGCCGTGCCGTTCATCCTCAACTTCATGCGCCAGGTG 3'5' CATGAAGTTGAGGATGAACGGCACGGCGCCACCGATACAGAC 3'2. A210M MtFACL135' ATGTTCCACGTGATGGCGTTGACGACGGTCATCT 3'5' GTCGTCAACGCCATCACGTGGAACATCGGCAGCG 3'3. FSHins MtFACL13 (SFQL)5' ATGCCGCAGTTCAGCTTTCTGCAGGATGCGACGAAGGTGTGGTC 3'5' CTTCGTCGCATCCTGCAGAAAGCTGAACTGCGGCATCGAGATCAG 3' |

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| AfFACL (P9WQ37): Cloned as a hexahistidine-tagged protein at the N-terminus5' GGCAGCCATATGGAGTTGAAGTACAAAATCGGA 3'5' CGTCCGTCGACACCCTTTTCGGCCTCCTTCT 3' |
| Canonical pocket mutants of AfFACL1. A276F AfFACL5' GCCGTTCCTCCATTTCTCAACGTGCTCGTCAACAC 3'5' GAGCACGTTGAGAAATGGAGGAACGGCCCATGAAA 3'2. A232M AfFACL5' ATGTTCCATTCAATGGAGTTTGGACTGGTCAATT 3'5' AGTCCAAACTCCATTGAATGGAACATTGGCATGC 3'3. FSHins AfFACL (SFQL)5' GGAATGTTTAACAGCTTTCTGCAGCAGGAGATGCTGGCTGAGAA 3'5' CAGCATCTCCTGCTGCAGAAAGCTGTTAAACATTCCCATCACAA 3' |

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| EcFACL (P69451): Cloned as a hexahistidine-tagged protein at the C-terminus5' CATATGGCTAGCATGAAGAAGGTTTGGCTTAACCGTTA 3'5' GTGGTGCTCGAGGGCTTTATTGTCCACTTTGC 3' |
| Canonical pocket mutants of EcFACL1. T308F EcFACL5' ACGGGCGTTAACTTTTTGTTCAATGCGTTGCTGAA 3'5' CGCATTGAACAAAAAGTTAACGCCCGTGATAGCGG 3'2. A264M EcFACL5' GCTGCCGCTGTATCACATTTTTATGCTGACCATTAACTGCCTGCTGTTTATCGAAC 3'5' CAGCAGGCAGTTAATGGTCAGCATAAAAATGTGATACAGCGGCAGCGCCGTCAC 3'3. FSHins EcFACL (SFQL)5' GCTTATCACTAACCCGCGCAGCTTTCTGCAGGATATTCCAGGGTTGGTAAAAGAGTTAGC 3'5' CTTTTACCAACCCTGGAATATCCTGCAGAAAGCTGCGCGGGTTAGTGATAAGCAGGTTCTG 3' |