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# Plant Defense Responses in Opium Poppy Cell Cultures Revealed by Liquid Chromatography-Tandem Mass Spectrometry Proteomics

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Molecular & Cellular Proteomics

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Table I. **Evidence for the identification of proteins with two or more peptide matches.** Theoretical/hypothetical pI values are shown for proteins identified from public databases, but could not provided when matches were based on opium poppy EST information since most entries do not contain complete nucleotide sequence data.

| Spot Number | Accession Number | Protein Name   | Unique Peptides (EST) | Unique Peptides (Public) | Sequence Coverage (%) | Protein Score | Species                              | pI      |
|-------------|------------------|--|-----------------------|--------------------------|-----------------------|---------------|--------------------------------------|---------|
| 1           | AAB91471         | Heat shock protein 70                                  |                       | 10                       | 15                    | 143           | <i>Spinacia oleracea</i>             | 5.2/4.9 |
| 2           | NP_001066486     | Heat shock protein 70                                  |                       | 6                        | 12                    | 160           | <i>Oryza sativa</i>                  | 5.2/4.9 |
| 3           | gi004052         | Protein disulfide isomerase                            | 5                     |                          | 15                    | 106           | <i>Papaver somniferum</i>            |         |
| 5           | AAP44754         | RuBisCO large subunit binding protein subunit $\alpha$ |                       | 6                        | 13                    | 215           | <i>Oryza sativa</i>                  | 4.8/4.9 |
|             | gi003286         | RuBisCO large subunit binding protein subunit $\alpha$ | 6                     |                          |                       | 132           | <i>Papaver somniferum</i>            |         |
| 9           | AAC19402         | 26S Proteasome regulatory subunit                      |                       | 4                        | 13                    | 150           | <i>Mesembryanthemum crystallinum</i> | 4.5/4.6 |
| 14          | P54776           | 26S Protease regulatory subunit                        |                       | 8                        | 23                    | 96            | <i>Solanum lycopersicum</i>          | 4.9/5.1 |
|             | gi001412         | 26S Proteasome regulatory subunit                      | 4                     |                          |                       | 73            | <i>Papaver somniferum</i>            |         |
| 29          | NP_001047463     | Succinyl-CoA synthetase                                |                       | 15                       | 12                    | 282           | <i>Oryza sativa</i>                  | 6/5.4   |
| 31          | NP_001047463     | Succinyl-CoA synthetase                                |                       | 5                        | 13                    | 92            | <i>Oryza sativa</i>                  | 6/5.5   |
| 32          | AAP73449         | Actin  |                       | 9                        | 29                    | 367           | <i>Gossypium hirsutum</i>            | 5.3/5.5 |
|             | gi003061         | Actin  | 6                     |                          |                       | 109           | <i>Papaver somniferum</i>            |         |
| 35          | CAA46787         | Glutamate semialdehyde aminotransferase                |                       | 3                        | 9                     | 108           | <i>Nicotiana tabacum</i>             | 6.2/5.7 |
| 36          | gi005744         | Monodehydroascorbate reductase                         | 3                     |                          |                       | 90            | <i>Papaver somniferum</i>            | 5.3/5.7 |
| 37          | NP_176015        | Phosphoglycerate kinase                                |                       | 6                        | 25                    | 180           | <i>Arabidopsis thaliana</i>          | 5.7/5.8 |
| 47          | AAD03394         | ATPase   |                       | 8                        | 20                    | 551           | <i>Nicotiana sylvestris</i>          | 5.7/5.6 |
|             | gi002525         | ATPase   | 3                     |                          |                       | 84            | <i>Papaver somniferum</i>            |         |
| 48          | AAD03394         | ATPase   |                       | 10                       | 24                    | 250           | <i>Nicotiana sylvestris</i>          | 6/5.6   |
|             | gi001192         | ATPase   | 1                     |                          |                       | 106           | <i>Papaver somniferum</i>            |         |
| 49          | gi011007         | Alanine aminotransferase                               | 3                     |                          |                       | 135           | <i>Papaver somniferum</i>            |         |
| 50          | Q6RIB7           | Enolase  |                       | 2                        | 11                    | 105           | <i>Medicago truncatula</i>           | 5.8/5.6 |
| 50          | AAD03394         | ATPase   |                       | 7                        | 20                    | 156           | <i>Nicotiana sylvestris</i>          |         |
| 51          | gi11007          | Alanine aminotransferase                               | 4                     |                          |                       | 97            | <i>Papaver somniferum</i>            |         |
| 52          | AAR05449         | Alanine aminotransferase                               |                       | 3                        | 7                     | 100           | <i>Capsicum annuum</i>               | 5.3/5.7 |

|       |              |                               |   |    |    |     |                             |         |
|-------|--------------|-------------------------------|---|----|----|-----|-----------------------------|---------|
|       | gi11007      | Alanine aminotransferase      | 3 |    |    | 126 | <i>Papaver somniferum</i>   |         |
| 53    | CAA75478     | ATPase                        |   | 6  | 20 | 158 | <i>Sorghum bicolor</i>      | 6/5.7   |
| 53    | P42896       | Enolase                       |   | 3  | 17 | 100 | <i>Ricinus communis</i>     | 5.6/5.7 |
|       | gi2148       | Enolase                       | 3 |    |    | 93  | <i>Papaver somniferum</i>   |         |
| 55    | Q43321       | Enolase                       |   | 5  | 17 | 133 | <i>Alnus glutinosa</i>      | 5.4/5.8 |
| 55    | gi2148       | Enolase                       | 6 |    |    | 115 | <i>Papaver somniferum</i>   |         |
| 57    | P42896       | Enolase                       |   | 5  | 13 | 133 | <i>Ricinus communis</i>     | 5.7/5.9 |
|       | gi2148       | Enolase                       | 7 |    |    | 136 | <i>Papaver somniferum</i>   |         |
|       |              | 6-Phosphogluconate            |   |    |    |     |                             |         |
| 58    | NP_176601    | dehydrogenase                 |   | 5  | 13 | 155 | <i>Arabidopsis thaliana</i> | 5.3/5.9 |
| 59    | P42896       | Enolase                       |   | 2  | 8  | 93  | <i>Ricinus communis</i>     | 5.6/5.8 |
|       | gi8117       | Enolase                       | 2 |    |    | 102 | <i>Papaver somniferum</i>   |         |
| 60    | gi4235       | Dihydroxyacid dehydratase     | 3 |    |    | 78  | <i>Papaver somniferum</i>   |         |
|       |              | 2,3-Bisphosphoglycerate-      |   |    |    |     |                             |         |
|       |              | independent phosphoglycerate  |   |    |    |     |                             |         |
|       |              | mutase                        |   | 2  | 3  | 112 | <i>Oryza sativa</i>         | 6/5.7   |
| 63    | P35494       |                               |   |    |    |     |                             |         |
| 64    | NP_001045601 | Chaperonin/Heat shock protein |   | 5  | 12 | 124 | <i>Oryza sativa</i>         | 6.3/5.7 |
|       |              | 2,3-Bisphosphoglycerate-      |   |    |    |     |                             |         |
|       |              | independent phosphoglycerate  |   |    |    |     |                             |         |
|       |              | mutase                        |   | 4  | 8  | 117 | <i>Arabidopsis thaliana</i> | 5.5/5.6 |
|       |              | 2,3-Bisphosphoglycerate-      |   |    |    |     |                             |         |
|       |              | independent phosphoglycerate  |   |    |    |     |                             |         |
|       |              | mutase                        |   | 3  | 5  | 85  | <i>Nicotiana tabacum</i>    | 6/5.6   |
| 68,69 | P35494       |                               |   |    |    |     |                             |         |
| 70    | Q05046       | Chaperonin (HSP60)            |   | 11 | 20 | 151 | <i>Cucurbita maxima</i>     | 6.3/5.5 |
|       | gi1840       | GroEL-like chaperone, ATPase  | 4 |    |    | 65  | <i>Papaver somniferum</i>   |         |
| 71    | Q05046       | Chaperonin (HSP60)            |   | 14 | 21 | 148 | <i>Cucurbita maxima</i>     | 6.3/5.5 |
| 72    | NP_001045601 | GroEL-like chaperone, ATPase  |   | 4  | 8  | 171 | <i>Oryza sativa</i>         | 6.3/5.4 |
| 74    | NP_001045601 | GroEL-like chaperone, ATPase  |   | 5  | 10 | 115 | <i>Oryza sativa</i>         | 5.8/5.3 |
| 74    | AAN63805     | Chaperonin (HSP60)            |   | 3  | 6  | 97  | <i>Prunus dulcis</i>        | 5.8/5.3 |
| 78    | ABN05716     | Chaperone DnaK                |   | 4  | 8  | 132 | <i>Medicago truncatula</i>  | 6/5.5   |
|       | gi10796      | Heat shock protein 70         | 4 |    |    | 96  | <i>Papaver somniferum</i>   |         |
| 80    | CAB37531     | Heat shock protein 70         |   | 2  | 4  | 80  | <i>Arabidopsis thaliana</i> | 5.5/5.4 |
| 81    | NP_195869    | Heat shock protein 70         |   | 3  | 10 | 109 | <i>Arabidopsis thaliana</i> | 5/5.4   |
| 83    | NP_001051724 | Heat shock protein 70         |   | 6  | 15 | 196 | <i>Oryza sativa</i>         | 5.1/5.4 |
| 84    | AAN86274     | Heat shock protein 70         |   | 10 | 20 | 137 | <i>Cucurbita maxima</i>     | 5.1/5.3 |
|       | gi4543       | Heat shock protein 70         | 3 |    |    | 104 | <i>Papaver somniferum</i>   |         |
| 85    | P49118       | Heat shock protein 70         |   | 5  | 9  | 166 | <i>Solanum lycopersicum</i> | 5.1/5.4 |
|       | gi357        | Heat shock protein 70         | 3 |    |    | 82  | <i>Papaver somniferum</i>   |         |
| 86    | P24067       | Heat shock protein 70         |   | 2  | 4  | 86  | <i>Zea mays</i>             | 5.15.4  |

|     |           |  |   |    |    |     |                                |         |
|-----|-----------|--|---|----|----|-----|--------------------------------|---------|
|     | gi7117    | Heat shock protein 70                    | 2 |    |    | 75  | <i>Papaver somniferum</i>      |         |
| 87  | P49118    | Heat shock protein 70                    |   | 10 | 15 | 197 | <i>Solanum lycopersicum</i>    | 5.1/5.3 |
|     | gi4543    | Heat shock protein 70                    | 2 |    |    | 115 | <i>Papaver somniferum</i>      |         |
|     | gi2999    | Heat shock protein 70                    | 2 |    |    | 83  | <i>Papaver somniferum</i>      |         |
| 88  | BAA12348  | Luminal binding protein precursor        |   | 5  | 8  | 187 | <i>Arabidopsis thaliana</i>    | 5.1/5.3 |
| 91  | P54774    | Cell division cycle protein 48           |   | 6  | 8  | 87  | <i>Glycine max</i>             | 5.2/5.3 |
| 116 | NP_187789 | Chaperonin                               |   | 4  | 6  | 70  | <i>Arabidopsis thaliana</i>    | 6.0/6.0 |
| 129 | AAL05454  | Enolase                                  |   | 4  | 10 | 94  | <i>Nitella opaca</i>           | 5.2/6   |
| 133 | Q9LKG7    | UDP-glucose pyrophosphorylase            |   | 4  | 8  | 122 | <i>Astragalus membranaceus</i> |         |
| 141 | AAV66502  | ATPase                                   |   | 6  | 16 | 112 | <i>Plantago coronopus</i>      | 7.8/6.4 |
|     | gi2886    | ATPase                                   | 3 |    |    | 58  | <i>Papaver somniferum</i>      |         |
| 151 | P49611    | SAM synthetase                           |   | 2  | 7  | 113 | <i>Ostreococcus tauri</i>      | 5.5/6.2 |
| 155 | AAG42490  | SAM synthetase                           |   | 6  | 15 | 231 | <i>Suaeda salsa</i>            | 5.8/6   |
|     | gi5003    | SAM synthetase                           | 2 |    |    | 98  | <i>Papaver somniferum</i>      |         |
| 156 | P48498    | SAM synthetase                           |   | 5  | 14 | 272 | <i>Petunia x hybrida</i>       | 5.5/6   |
|     | gi10131   | SAM synthetase                           | 4 |    |    | 96  | <i>Papaver somniferum</i>      |         |
| 157 | P48498    | SAM synthetase                           |   | 5  | 17 | 267 | <i>Petunia x hybrida</i>       | 5.5/6   |
|     | gi1853    | SAM synthetase                           | 3 |    |    | 112 | <i>Papaver somniferum</i>      |         |
| 158 | Q96552    | SAM synthetase                           |   | 4  | 21 | 123 | <i>Catharanthus roseus</i>     | 5.5/6   |
| 159 | BAA86060  | Dihydroorotate dehydrogenase             |   | 2  | 5  | 130 | <i>Pyrus pyrifolia</i>         | 6.2/5.9 |
|     | gi10476   | Dihydroorotate dehydrogenase             | 2 |    |    | 73  | <i>Papaver somniferum</i>      |         |
| 160 | AAN07179  | SAM synthetase                           |   | 7  | 18 | 370 | <i>Carica papaya</i>           | 5.5/5.9 |
|     | gi5003    | SAM synthetase                           | 2 |    |    | 108 | <i>Papaver somniferum</i>      |         |
| 161 | gi2111    | Dihydroorotate dehydrogenase             | 2 |    |    | 110 | <i>Papaver somniferum</i>      |         |
| 161 | BAA86060  | Enolase                                  |   | 2  | 5  | 84  | <i>Pyrus pyrifolia</i>         | 6.4/5.8 |
| 165 | gi4434    | Alcohol dehydrogenase                    | 2 |    |    | 63  | <i>Papaver somniferum</i>      |         |
| 166 | gi10244   | Glutamate dehydrogenase                  | 3 |    |    | 83  | <i>Papaver somniferum</i>      |         |
| 167 | gi10244   | Pyruvate dehydrogenase                   | 3 |    |    | 84  | <i>Papaver somniferum</i>      |         |
| 168 | CAA61511  | Mitochondrial elongation factor Tu       |   | 8  | 17 | 117 | <i>Arabidopsis thaliana</i>    | 5.5/6.2 |
|     | gi11996   | Mitochondrial elongation factor Tu       | 4 |    |    | 88  | <i>Papaver somniferum</i>      |         |
| 172 | CAH58641  | Malate dehydrogenase                     |   | 7  | 27 | 185 | <i>Plantago major</i>          | 6.1/6.4 |
|     | gi1623    | Malate dehydrogenase                     | 2 |    |    | 70  | <i>Papaver somniferum</i>      |         |
|     |           | Glyceraldehyde-3-phosphate dehydrogenase |   |    |    |     |                                |         |
| 172 | gi4105    | dehydrogenase                            | 4 |    |    | 203 | <i>Papaver somniferum</i>      |         |
|     | gi4054    | Malate dehydrogenase                     | 5 |    |    | 91  | <i>Papaver somniferum</i>      |         |
| 173 | P17783    | Malate dehydrogenase                     |   | 5  | 13 | 133 | <i>Vitis vinifera</i>          | 8.2/6.5 |
| 173 | gi1623    | Malate dehydrogenase                     | 3 |    |    | 131 | <i>Papaver somniferum</i>      |         |
|     | gi4105    | Malate dehydrogenase                     | 2 |    |    | 82  | <i>Papaver somniferum</i>      |         |

|     |              |   |   |   |    |     |                                      |         |
|-----|--------------|---|---|---|----|-----|--------------------------------------|---------|
| 174 | AAB61592     | Fructosebiphosphate aldolase                          |   | 3 | 12 | 106 | <i>Mesembryanthemum crystallinum</i> | 6.5/6.5 |
| 175 | NP_564625    | Malate dehydrogenase                                  |   | 2 | 10 | 92  | <i>Arabidopsis thaliana</i>          | 6.4/6.5 |
|     | gi1623       | Malate dehydrogenase                                  | 2 |   |    | 86  | <i>Papaver somniferum</i>            |         |
| 176 | gi4054       | Malate dehydrogenase                                  | 4 |   |    | 96  | <i>Papaver somniferum</i>            |         |
| 177 | CAH58641     | Malate dehydrogenase                                  |   | 6 | 18 | 134 | <i>Plantago major</i>                | 6.1/6.7 |
|     | gi11554      | Malate dehydrogenase                                  | 5 |   |    | 110 | <i>Papaver somniferum</i>            |         |
| 182 | gi7829       | Flavoprotein pyridine nucleotide cytochrome reductase | 3 |   |    | 72  | <i>Papaver somniferum</i>            |         |
| 183 | O48551       | 20S Proteasome $\alpha$ subunit                       |   | 3 | 23 | 97  | <i>Glycine Max</i>                   | 5.8/6.4 |
|     | gi8292       | Proteosome $\alpha$ subunit                           | 5 |   |    | 93  | <i>Papaver somniferum</i>            |         |
| 184 | gi6066       | Dirigent-like protein                                 | 3 |   |    | 74  | <i>Papaver somniferum</i>            |         |
| 185 | CAC19494     | 20S Proteasome $\alpha$ subunit                       |   | 3 | 15 | 92  | <i>Zea mays</i>                      | 5.8/6.3 |
| 186 | Unknown      | Hypothetical protein                                  |   | 1 |    | 102 | <i>Medicago truncatula</i>           | 7.7/6.2 |
|     | gi9514       | Hypothetical protein/putative ATP synthase            | 6 |   |    | 95  | <i>Papaver somniferum</i>            |         |
| 188 | AAD03394     | ATPase  |   | 3 | 6  | 79  | <i>Nicotiana glauca</i>              | 6.1/6.1 |
|     | gi2525       | ATPase  | 2 |   |    | 62  | <i>Papaver somniferum</i>            |         |
| 192 | Q6YYW3       | Malate dehydrogenase                                  |   | 5 | 19 | 132 | <i>Oryza sativa</i>                  | 7/6.1   |
| 193 | Q6YYW3       | Malate dehydrogenase                                  |   | 6 | 19 | 96  | <i>Oryza sativa</i>                  | 7.6/6.1 |
| 194 | NP_001043900 | ATPase  |   | 8 | 22 | 187 | <i>Oryza sativa</i>                  | 5.3/6.1 |
|     | gi2525       | (R,S)-Norcoclaurine 6-O-methyltransferase             | 2 |   |    | 74  | <i>Papaver somniferum</i>            |         |
| 196 | gi2585       | (R,S)-Norcoclaurine 6-O-methyltransferase             | 3 |   |    | 88  | <i>Papaver somniferum</i>            |         |
| 197 | CAA42103     | Glyceraldehyde-3-phosphate dehydrogenase              |   | 4 | 13 | 210 | <i>Antirrhinum majus</i>             | 6.1/6.2 |
| 197 | CAH58641     | Malate dehydrogenase                                  |   | 4 | 22 | 246 | <i>Plantago major</i>                | 7.1/6.2 |
|     | gi11554      | Malate dehydrogenase                                  | 4 |   |    | 82  | <i>Papaver somniferum</i>            |         |
| 198 | Q6YYW3       | Malate dehydrogenase                                  |   | 4 | 13 | 213 | <i>Papaver somniferum</i>            |         |
| 201 | AAB61672     | Type IIIa membrane protein cpwap13                    |   | 3 | 8  | 155 | <i>Vigna unguiculata</i>             | 6.2/6   |
| 202 | AAC49651     | Actin   |   | 5 | 18 | 239 | <i>Striga asiatica</i>               | 5.4/6   |
|     | gi3061       | Actin   | 3 |   |    | 90  | <i>Papaver somniferum</i>            |         |
| 206 | NP_192629    | Arginase  |   | 2 | 6  | 124 | <i>Papaver somniferum</i>            |         |
| 208 | AAC49964     | Isocitrate dehydrogenase                              |   | 2 | 5  | 140 | <i>Arabidopsis thaliana</i>          | 8.4/5.9 |
| 212 | O81154       | Cysteine synthase                                     |   | 4 | 16 | 174 | <i>Solanum tuberosum</i>             | 6.3/5.9 |
| 215 | gi1617       | Pyruvate dehydrogenase                                | 1 |   |    | 127 | <i>Papaver somniferum</i>            |         |
| 226 | AAC05116     | Isoflavone reductase-like protein                     |   | 2 | 8  | 86  | <i>Betula pendula</i>                | 7.9/5.4 |

|     |          |  |   |   |    |     |                             |         |
|-----|----------|--|---|---|----|-----|-----------------------------|---------|
|     | gi11276  | Isoflavone reductase-like protein              | 4 |   |    | 116 | <i>Papaver somniferum</i>   |         |
|     | gi9146   | Isoflavone reductase-like protein              | 4 |   |    | 72  | <i>Papaver somniferum</i>   |         |
| 228 | AAA80675 | Fructokinase                                   |   | 3 | 10 | 125 | <i>Beta vulgaris</i>        | 5.4/5.2 |
|     | gi7177   | Fructokinase                                   | 3 |   |    | 66  | <i>Papaver somniferum</i>   |         |
| 230 | gi7784   | Catalytic coenzyme binding protein             | 3 |   |    | 86  | <i>Papaver somniferum</i>   |         |
| 230 | gi3266   | Catalytic coenzyme binding protein             | 5 |   |    | 72  | <i>Papaver somniferum</i>   |         |
| 237 | ABA81880 | Proteosome                                     |   | 5 | 19 | 143 | <i>Solanum tuberosum</i>    | 5.4/5.4 |
|     | gi542    | Proteosome $\alpha$ subunit                    | 3 |   |    | 131 | <i>Papaver somniferum</i>   |         |
| 239 | gi4542   | 20S Proteasome $\alpha$ subunit                | 4 |   |    | 79  | <i>Papaver somniferum</i>   |         |
| 242 | gi7169   | Ascorbate peroxidase                           | 3 |   |    | 106 | <i>Papaver somniferum</i>   |         |
| 244 | gi7169   | Ascorbate peroxidase                           | 3 |   |    | 91  | <i>Papaver somniferum</i>   |         |
| 250 | gi6158   | 20S Proteasome $\alpha$ subunit                | 4 |   |    | 65  | <i>Papaver somniferum</i>   |         |
| 269 | gi6948   | Glutathione S-transferase                      | 2 |   |    | 60  | <i>Papaver somniferum</i>   |         |
| 273 | gi7648   | Proteosome $\alpha$ subunit                    | 5 |   |    | 62  | <i>Papaver somniferum</i>   |         |
| 278 | gi8181   | Eukaryotic initiation factor                   | 5 |   |    | 77  | <i>Papaver somniferum</i>   |         |
| 281 | gi3791   | Ascorbate peroxidase                           | 3 |   |    | 115 | <i>Papaver somniferum</i>   |         |
|     | gi1161   | Ascorbate peroxidase                           | 3 |   |    | 62  | <i>Papaver somniferum</i>   |         |
| 282 | gi8637   | Triosphosphate isomerase                       | 2 |   |    | 138 | <i>Papaver somniferum</i>   |         |
| 286 | gi5847   | Proteosome $\beta$ subunit                     | 5 |   |    | 83  | <i>Papaver somniferum</i>   |         |
| 288 | gi8262   | Dirigent-like protein                          | 3 |   |    | 81  | <i>Papaver somniferum</i>   |         |
|     | gi5537   | Unknown  | 2 |   |    | 73  | <i>Papaver somniferum</i>   |         |
| 291 | gi1373   | Pathogenesis-related protein                   | 2 |   |    | 50  | <i>Papaver somniferum</i>   |         |
| 294 | gi2159   | Pathogenesis-related protein                   | 3 |   |    | 89  | <i>Papaver somniferum</i>   |         |
| 295 | gi2159   | Pathogenesis-related protein                   | 3 |   |    | 63  | <i>Papaver somniferum</i>   |         |
| 305 | gi6644   | Triosphosphate isomerase                       | 3 |   |    | 63  | <i>Papaver somniferum</i>   |         |
| 309 | gi9414   | ATP synthase D chain,<br>mitochondrial (ATP5H) | 3 |   |    | 89  | <i>Papaver somniferum</i>   |         |
| 311 | gi693    | Pathogenesis-related protein                   | 2 |   |    | 68  | <i>Papaver somniferum</i>   |         |
| 314 | gi4973   | Thioredoxin                                    | 4 |   |    | 80  | <i>Papaver somniferum</i>   |         |
| 316 | BAA03741 | RNA-binding glycine rich protein               |   | 2 | 15 | 111 | <i>Nicotiana sylvestris</i> | 5.6/5.7 |
|     | gi693    | RNA-binding glycine rich protein               | 2 |   |    | 87  | <i>Papaver somniferum</i>   |         |
| 317 | BAA03743 | RNA-binding glycine rich protein               |   | 3 | 23 | 140 | <i>Nicotiana sylvestris</i> | 5.6/5.8 |
| 320 | gi8013   | Non-symbiotic hemoglobin                       | 3 |   |    | 60  | <i>Papaver somniferum</i>   |         |
| 331 | gi2775   | Copper chaperone                               | 3 |   |    | 64  | <i>Papaver somniferum</i>   |         |
| 336 | P27161   | Calmodulin                                     |   | 2 | 24 | 205 | <i>Solanum lycopersicum</i> | 4.1/4.3 |
| 336 | gi7597   | Calmodulin                                     | 3 |   |    | 104 | <i>Papaver somniferum</i>   |         |
| 337 | 1109190A | Calmodulin                                     |   | 5 | 36 | 254 | <i>Triticum aestivum</i>    | 4.1     |