Supplementary Material

Expression of the *tobacco* non-symbiotic class 1 hemoglobin gene *Hb1* reduces cadmium levels by modulating Cd transporter expression through decreasing nitric oxide and ROS level in *Arabidopsis*

**Ramin Bahmani1,2,3, DongGwan Kim1,2,3, JongDuk Na1 and Seongbin Hwang1,2,3\***

Dept. of Molecular Biology1,Dept. of Bioindustry and Bioresource Engineering2, and Plant Engineering Research Institute3, Sejong University, Seoul, 143-747, KOREA

**\*Correspondence:** Corresponding Author: sbhwang@sejong.ac.kr

# Supplementary Tables

**Supplemental Table S1.** Sequences of primers used for cloning and gene expression (q-RT PCR) analysis.

**1-1 Supplemental Table S1.** Sequences of primers used for cloning and gene expression (q-RT PCR) analysis.

|  |  |  |
| --- | --- | --- |
| **Gene name** | **Locus** | **Primer Sequences** |
| *AtActin2* | AT3G18780 | F: 5′-GCAGAGCGGGAAATTGTAAG-3′ |
| R: 5′-TTCTCGATGGAAGAGCTGGT-3′ |
| *AtCAX1* | AT2G22475 | F: 5′-TGCTTGGTAGATGGGGAAAG-3′ |
| R: 5′-ATTCTTCCCATTGCAGCATC-3′ |
| *AtCAX2* | AT5G24520 | F: 5′-CGAGCATCCTTATCCTCCAA-3′ |
| R: 5′-GCTCGACGGTTGATGAATCT-3′ |
| *AtCAX3* | AT1G79840 | F: 5′-ACGTGGGACAATGGAAAGAG-3′ |
| R: 5′-AGCTGCATCTCTCCGAACAT-3′ |
| *AtCAX4* | AT1G66470 | F: 5′-CCTAAATCCGCTGGAAACAA-3′ |
| R: 5′-TTGTTGGCTTAGGCTTGGTC-3′ |
| *AtHMA2* | AT3G23050 | F: 5′-GAACTTTGGTGGAGGAGCAG-3′ |
| R: 5′-GGCCAATGCATCAGAAAGAT-3′ |
| *AtHMA4* | AT2G38120 | F: 5′-CCACTCCAACGCTTTCTCTC-3′ |
| R: 5′-TGTCATGCATCCCAATCACT-3′ |
| *AtNRAMP3* | AT1G05180 | F: 5′-AACGGCTCAGTACTCCCAGA-3′ |
| R: 5′-CGGAACAAACTGCTTTGTGA-3′ |
| *AtPDR8* | AT1G66340 | F: 5′-GTACACCTTGGGTGCGAAGT-3′ |
| R: 5′-CGTGAATACGGAGAGCGATT-3′ |
| *AtABCC1* | AT5G03730 | F: 5′-CGGTCACTCAACCTCCAAAT-3′ |
| R: 5′-ACTCAGGCGACGTCTCTCAT-3′ |
| *AtIRT1* | AT4G19690 | F: 5′-AGCTTTGATCACGGTTGGAC-3′ |
| R: 5′-AGAAGAGCCGCGATTAAACA-3′ |
| *AtACA10* | AT4G29900.1 | F: 5′-GCACGCCCAAGCAATAAGAG-3′R: 5′-TCTGCTCCTGTCCGATACCA-3′ |
| *AtPCR1* | AT1G14880.1 | F: 5′-GGTCCACAGGCTTCTGTGAT-3′R: 5′-CCGCACAACACGATTTGGAT-3′ |
| *AtPCS1* | AT5G44070 | F: 5′-TTGTTGTCGGGAAACTTGCG-3′R: 5′-TTCATTCCCATCACGCACCA-3′ |
| *NtHB1*(cloning) | AII99810.1 | F- 5’-GCGTCTAGAATGAGTAGCTTTACAGAAGA-3’R- 5’-ATAGGATCCCTACTTCATCTCGGTCTTGA-3’ |
| *AtHB1*(promoter)(cloning) | AT2G16060 | F- 5’-TCTAGATTAAGGAGTACAAAGGGAA-3’R- 5’-AAGCTTTTGTGTTACCGAAGAGACAGT-3’ |