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1 Roles of MSH2 and MSH6 in Cadmium-induced G2/M checkpoint arrest in

2 Arabidopsis roots

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16 ABSTRACT

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18 DNA mismatch repair (MMR) proteins have been implicated in sensing and correcting
19 DNA damage, and in governing cell cycle progression in the presence of structurally
20 anomalous nucleotide lesions induced by different stresses in mammalian cells. Here,
21 Arabidopsis seedlings were grown hydroponically on 0.5×MS media containing cadmium
22 (Cd) at 0-4.0 mg L⁻¹ for 5 d. Flow cytometry results indicated that Cd stress induced a
23 G2/M cell cycle arrest both in *MLH1*-, *MSH2*-, *MSH6*-deficient, and in WT roots,
24 associated with marked changes of G2/M regulatory genes, including *ATM*, *ATR*, *SOG1*,
25 *BRCA1*, *WEE1*, *CYCD4;1*, *MAD2*, *CDKA;1*, *CYCB1;2* and *CYCB1;1*. However, the Cd-
26 induced G2/M phase arrest was markedly diminished in the *MSH2*- and *MSH6*-deficient
27 roots, while a lack of *MLH1* had no effect on Cd-induced G2 phase arrest relative to that in
28 the wild type roots under the corresponding Cd stress. Expression of the above G2/M

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