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## Growth Suppression of HL60 and L6 Cells by Atomic Hydrogen

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### Abstract

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We previously reported electrolyzed reduced water (ERW) which produced near the cathode by electrolysis has a reductive activity. We also revealed that ERW contains both molecular hydrogen and platinum nanoparticles (Pt nps) derived from platinum-coated titanium electrodes. Pt nps have

catalysis activity converting molecular hydrogen to atomic hydrogen. Thus, we regard a solution containing both dissolved hydrogen and Pt nps as a model water of ERW ( $H_2$ /Pt nps solution), and then we tried to examine the physiological effects of  $H_2$ /Pt nps solution. To our knowledge, there is no report on physiological effects of  $H_2$ /Pt nps solution. Here, we report the effects of  $H_2$ /Pt nps solution on the growth of promyelocytic cell line, HL60 cells and myogenic cell lines, L6 cells.  $H_2$ /Pt nps solution suppressed cell growth in the presence of both hydrogen and Pt nps in a dose dependent manner. The result of sub-G1 analysis suggests that  $H_2$ /Pt nps solution induces apoptosis in both HL60 and L6 cells. The labeled Pt nps in HL60 cells were detected in liposome, suggesting Pt nps is incorporated by endocytosis. These results suggest that atomic hydrogen catalyzed by Pt nps induced significant cell growth suppression and atomic hydrogen may be one of new signal of cell function.

#### Keywords

**Platinum    Nanoparticles    Apoptosis**

**Atomic hydrogen    Antioxidant    ROS**

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