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D-Erythroascorbic acid regulates cyanide-resistant respiration in *Candida albicans*

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Candida albicans possess cyanide-resistant respiratory pathway, which is mediated by alternative oxidase. The activity of alternative oxidase has been found to be dependent on several regulatory mechanisms. In order to investigate the influence of D-erythroascorbic acid on respiration of *C. albicans*, the respiratory activity of the cells was measured with oxygen monitor. *ALO1* is known to encode D-arabinono-1,4-lactone oxidase that catalyses the final step of D-erythroascorbic acid biosynthesis in *C. albicans*. We performed disruption and overexpression of *ALO1* in *C. albicans*. Cyanide-resistant respiration was decreased in *alo1* null mutant cells, but remarkably increased in *ALO1*-overexpressing cells. Also, we cloned the *MCR1* gene and performed disruption of the *MCR1* gene of *C. albicans*. *MCR1*, which is known to encode NADH-cytochrome b_5 reductase, plays an important role in NADH-D-erythroascorbyl free radical reductase activity in *Saccharomyces cerevisiae*. The activity of NADH-D-erythroascorbyl free radical reductase and intracellular level of D-erythroascorbic acid in the *mcr1* disruptant cells were decreased. Therefore, cyanide-resistant respiration was decreased in *mcr1* null mutant cells. These results suggested that the reduced form of D-erythroascorbic acid regulate cyanide-resistant respiration in *C. albicans*.