# Comparison of cytoprotective effects of piceatannol and resveratrol through SIRT1 activation

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The structure of piceatannol (PIC) is similar to that of a polyphenol resveratrol (RSV), an activator of an $NAD^+$-dependent protein deacetylase SIRT1. However, whether the PIC exhibit cytoprotective effect through the SIRT1 activation remains unclear. Here we compared to the cytoprotective effect through SIRT1 activation of PIC and RSV.
[Results and Methods] We used the C2C12 myoblasts in this experiment. Treatment with antimycin A, an inhibitor of complex III that induces reactive oxygen species (ROS), fluorescence of MitoSOX Red, an indicator of ROS, was increased 12-fold compared with control, but treatment with PIC or RSV suppressed AA-induced ROS reduced by 72% and 26%, respectively.
Treatment with AA significantly increased apoptosis and necrosis, but treatment with PIC or RSV significantly decreased AA-induced apoptosis and necrosis. In SIRT1 knockdown cells with siRNA, the anti-apoptotic effect of RSV was completely inhibited, whereas, the anti-apoptotic effect of PIC was partially retained.
RSV and PIC similarly decreased acetyl-histone H3 levels, suggesting SIRT1 activation.
RSV increased the expression of antioxidative enzymes such as SOD2 and catalase. On the other hand, PIC elevated catalase, but not SOD2. In the presence of deacetylase inhibitors, neither RSV nor PIC changed the acetyl-histone H3 level and antioxidant expression levels.
[Conclusion]
These results suggest that PIC has unknown cytoprotective mechanisms via SIRT1 activation independent pathway, unlike RSV.