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## The protective effects of betulinic acid and its derivatives on cobalt chloride-induced acute hypoxia assault in human retinal pigmented epithelial cells

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The Retinal Pigmented Epithelium (RPE) is a monolayer of cells located near the choroidal capillaries that mediates human visual cycle and nourishes other retinal cells. It is known that hypoxia-induced oxidative stress to RPE is a vital cause of many neo-vascular retinal diseases such as the Age-related Macular Degeneration and Diabetic Retinopathy. The therapeutic outcome of these diseases is often disappointing; therefore, it is clinically important to protect RPE cells from hypoxia assault. Betulinic Acid (BA) is a penta-cyclic tri-terpenoid with anti-oxidative property, but little is known about its effect on retinal cells. Our study investigated the protective effect of BA and its derivatives against cobalt chloride-induced hypoxia assault in human RPE cells. Human ARPE-19 cells were exposed to BA and its nineteen derivatives (named as H2-H20) that we customized through replacing moieties at C3 and C17 positions. We found that cobalt chloride reduced cell viability, increased ROS production as well as induced apoptosis and necrosis in ARPE-19 cells. Interestingly, the pretreatment of H7 compound effectively protected cells from acute hypoxia assault caused by cobalt chloride. Our immune-blotting results showed that H7 attenuated the cobalt chloride-induced phosphorylation of Akt, Erk and JNK pathways. All findings were further validated in human primary RPE cells. In summary, the BA derivate H7 has protective effect against the acute hypoxic assault in human RPE cells and may be developed into a candidate agent effective in the prevention of prevalent retinal diseases.

### Biography

Fanfan Zhou has obtained her PhD from Rutgers, the State University of New Jersey, USA in 2008. She is currently a Senior Lecturer in the School of Pharmacy, the University of Sydney, Australia. She has published more than 70 papers in reputed journals since 2003. She is an Editorial Board Member of two international journals and serves as Reviewer to many prestigious journals.

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