TBIS

Topic of the Speech:
The Dual Roles of Proanthocyanidins in Cultured Vascular Endothelial Cells

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Professor Ze Zhang received his B.Eng. and M.Eng. in 1982 and 1984 from Chengdu University of Science & Technology (now Sichuan University) and then a PhD degree in Experimental Medicine from Université Laval in 1993. After a postdoctoral training in Japan he returned to the Saint-François d'Assise Hospital Research Center in Quebec City in 1995 and later became a professor in the Department of Surgery Faculty of Medicine at Université Laval and a researcher in the Centre de recherche du CHU de Québec – Université Laval.

Dr. Zhang's research has been funded by the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC), le Fonds de la recherche en santé du Québec (FRSQ), and by industrial partners. He has more than one hundred journal publications, edited one book and authored several book chapters. His research interests include biomaterials, wound healing and cardiovascular implants.

ABSTRACT SUBMISSION

-For invited speaker only

The Dual Roles of Proanthocyanidins in Cultured Vascular Endothelial Cells

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ABSTRACT (NO MORE THAN 500 WORDS:)

Proliferation of vascular endothelial cells is required for angiogenesis that is a critical step in tissue regeneration and repair. Regulation of endothelial cell proliferation is normally achieved through various bioactive proteins such as vascular endothelial cell growth factors. Proanthocyanidins (PAs) belong to a group of naturally occurred polyphenols made of the oligomers of catechin, epicatechin and their derivatives. They present widely in plants and human diets such as apple, blueberry and grapes. Oligomeric proanthocyanidins (OPC) from grape seed extract are marketed as nutritional supplements largely because of their antioxidative property, despite the relatively low bioavailability after digestion. Studies have showed that PAs are inhibitory to tumor growth owing to their suppression to the proliferation of vascular endothelial cells and angiogenesis. In our study however, PAs were found being able to stimulate the proliferation of human umbilical vein endothelial cells (HUVEC). After testing a wide range of dose, we found that there existed a relatively narrow window of drug concentrations; and only within this window of dosage can PAs promote the proliferation and metabolic activity of HUVEC. Outside this window PAs either showed no effect or an inhibition to the cells. Our data therefore demonstrate that PAs may be used in vitro to promote endothelial cell growth and in vivo to stimulate angiogenesis and tissue repair. This work also suggests that the perception of the inhibitory effect of PAs on tumors needs further investigation.