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A novel bioactive compound derived from yeast extract as a potent nutraceutical for preventing vascular-related diseases

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Yeast extract has been used commercially in a food industry as a food additive. In spite of rich in nutrition, an application as nutraceuticals and functional foods along with its physiological effects is not wildly studied. Since it was reported that compounds containing a purine moiety e.g., adenine and adenosine and an imidazole moiety e.g., bioactive Trp-His peptide, exerted vascular protective effects such as vasorelaxant, anti-hypertensive and atherosclerotic effects. Thus, it was speculated that yeast extract rich in nucleotides might mediate vasoprotective effects and contain the potent candidates' compounds. The objectives of this study were to examine the vasorelaxant effect of yeast extract (*Candida utilis*); identify candidates responsible for the effect by using chromatographic and mass spectrometric analyses and elucidate the underlying mechanisms. This study provided the first evidence that *C. utilis* yeast extract exerted vasorelaxation in 1 μM phenylephrine (PE)-contracted Sprague-Dawley rat aortic rings. 5'-Methylthioadenosine (MTA) was identified as a new naturally-occurring vasodilator, exerting comparable power with a well-known vasodilator adenosine. MTA exerted vasorelaxation independent of endothelial layer and adenosine receptors. MTA reduced a $CaCl_2$-induced vasocontraction stimulated by 1 μM PE, whereas the effect was abolished in a 60 mMKCl-induced vasocontraction. MTA significantly ($P<0.01$) attenuated the PE-stimulated calmodulin-dependent kinase II (CaMK II) in the aortic rings and inhibited the phosphorylation of L-type Ca^{2}+ channel (VDCC). In conclusion, the underlying mechanisms of MTA-induced vasorelaxation involve the suppression of extracellular Ca^{2}+ influx partly through retardation of the CaMK II-VDCC phosphorylation pathway.

Biography

Thanutchaporn Kumrungsee has completed her BS in Food Science and Technology from Kasetsart University, Thailand, MS and PhD in Food Analysis and Postdoctoral studies from Kyushu University Japan. Currently, she is an Assistant Professor in Laboratory of Molecular Nutrition at Graduate School of Bioshere Science, Hiroshima University, Japan. Her research interests are in elucidation of food factors with potent preventive effects on lifestyle-related diseases and their mechanisms by application of metabolomics analyses. Her inspirational research quote is "Let food be your medicine".

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