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An association of metabolic syndrome constellation with cellular membrane caveolae: A possible mechanism

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Metabolic syndrome (MetS) is a cluster of metabolic abnormalities that can predispose an individual to a greater risk of developing type-2 diabetes and cardiovascular diseases. The cluster includes abdominal obesity, dyslipidemia, hypertension and hyperglycemia, all of which are risk factors to public health. While searching for a link among the aforementioned malaises, clues have been focused on the cell membrane domain caveolae, wherein the MetS-associated active molecules are co-localized and interacted with to carry out designated biological activities. Caveolae disarray could induce all of those individual metabolic abnormalities to be present in animal models and humans, providing a new target for therapeutic strategy in the management of MetS. Using a cellular model of caveolae inter-cellular movement (with the eGFP-labelled-caveolae), several potential herbal extracts and nutrients have shown their effects on externalization of caveolae, opening an initiative for the associated metabolic pathways. This also is supported by recent publications which have demonstrated that some clinical effective Chinese herbal or herbal extracts for the treatments of hypertension, hyperlipidemia and hyperglycemia can have a stimulating effect on cellular caveolae bioactivity. A new therapeutic target to effectively treat and prevent metabolic syndrome safely without significant side effects may become possible.

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Metabolic dysregulation and cancer-related outcomes: Implications for exercise in obese breast cancer survivors

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Metabolic dysregulation (MetD), defined here as metabolic syndrome (MSY), insulin resistance (IR), and visceral adiposity (VA), is a long-term complication of curative treatment for many cancers including breast, prostate, and testicular. MetD in breast cancer survivors (BCS) is a serious concern during cancer survivorship that if treated may improve survivorship and further prevent cancer recurrence. MetD, due to heightened adipose and systemic inflammation, and increased cell proliferation, may influence one's risk for cancer recurrence and mortality. BCS represent a distinctive group who endure many treatment-associated alterations in lifestyle habits including weight gain, reduced physical activity levels, and worsening metabolic profiles leading to MetD. Obesity at breast cancer diagnosis related markers of MetD including MSY and IR at diagnosis, and hyperinsulinemia post-treatment, are associated with increased risk of breast cancer mortality, all-cause mortality, and breast cancer recurrence. Given these facts, determination of effective exercise interventions for reducing MetD in BCS is a much needed area of research. Exercise may be an effective intervention for attenuating MetD, thereby reducing risk for additional associated chronic diseases. Since lifestyle factors such as exercise and dietary intake affect the risk of developing MetD, it is important, possibly preferable, to target lifestyle factors to prevent/manage MetD in BCS, particularly due to the fact that cancer survivors have undergone the physiologic burden of other cancer-related pharmacologic treatments with varying side effects. The purpose of this symposium will be to discuss the impact of MetD on cancer-related outcomes and the utilization of exercise to target MetD in obese BCS.

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