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## *Moringa oleifera* from food plant to phytomedicine

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Plants are well recognized a rich source of natural bioactive compounds (NBC) to act as lead molecules for discovery and development of drugs and phytomedicines.In this context, a highly nutritious food plant, namely *Moringa oleifera (M. oleifera),* has gained special attention as a remarkable source of functional foods and nutraceuticals (dietary health supplements) due to its wide array of high-value components and unique bioactives such as amino acids, biopeptides, vitamins, β-carotene, high-oleic lipids and polyphenolics along with a rich and rare combination of zeatin, glucosinolates, isothiocyanates and β-sitosterol. A number of medicinal and therapeutic properties such as diuretic, antiulcer, antipyretic, antioxidant, antimicrobial, anti-inflammatory,antitumor, antihypertensive, anti-diabetic and hepatoprotective have been ascribed to different parts of this plant. Moreover, different parts of this multipurpose plant serve as a tonic, cardiac and circulatory stimulant. In view of wide-ranging nutritional, medicinal and biological attributes of M. *oleifera*, the presentation is mainly framed to discus and highlights the potential of *Moringa* as a platform of natural substances and novel chemical entities for the development of a range of marketable innovative functional foods, phytomedicine and nutraceuticals/cosmo-nutraceuticals. An overview of *Moringa* based products, current market trends and future prospects are also presented.

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## Ginsenoside Rb1 promotes browning through regulation of PPARγ in 3T3-L1 adipocytes

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Browning of white adipocyte tissue (WAT) has received considerable attention due to its potential implication in preventing obesity and related comorbidities. Ginsenoside Rb1 is reported to improve glycolipid metabolism and reduce body weight in obese animals. However whether the body reducing effect mediates by browning effect remains unclear. For this purpose, 3T3-L1 adipocytes were used to study the effect of ginsenoside Rb1 on browning adipocytes specific genes and oxygen consumptions. The results demonstrate that 10 mM of ginsenoside Rb1 increases basal glucose uptake and promoted browning evidenced by significant increases in mRNA expressions of UCP-1, PGC-1a and PRDM16 in 3T3-L1 mature adipocytes. Further, ginsenoside Rb1 also increases PPARγ activity. And the browning effect is abrogated by GW9692, a PPARγ antagonist. In addition, ginsenoside Rb1 increases basal respiration rate, ATP production and uncoupling capacity in 3T3-L1 adipocytes. Those effects are also blunted by GW9692. The results suggest that ginsenoside Rb1 promote browning of 3T3-L1 adipocytes through induction of PPARγ. Our finding offer a new source to discover browning agonists and also useful to understand and extend the applications of ginseng and its constituents.

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