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The insulin resistance induced by obesity is reversed by *Uncaria tomentosa* through modulation of inflammatory pathway in the liver of mice

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We investigated the effect of the herbal extract *Uncaria tomentosa* (Ut) (50 mg/kg, crude extract, for 5 consecutive days) in two mice models of obesity: high fat diet (DIO) fed mice and the genetic ob/ob mice. Both obese mice exhibited diabetes ($151 \pm 4 \text{ mg}^* \text{dL}^{-1}$ vs. $90 \pm 2 \text{ mg}^* \text{dL}^{-1}$ and $205 \pm 15 \text{ mg/dL}$ vs. $163 \pm 11 \text{ mg/dL}$, $p < 0.05$, respectively) and insulin resistance (Kitt: $4.0 \pm 0.1\% * \text{min}^{-1}$ vs. $0.5 \pm 0.3\% * \text{min}^{-1}$, $p < 0.05$, respectively). The Ut treatment induced a 1.8-fold rise in insulin sensitivity in the DIO mice to similar value to that found in the lean group $5.3 \pm 0.5\% * \text{min}^{-1}$ and 20% reduction in the fasting glycaemia of both obese mice. The DIO group had 30% and 50% reduction in the protein expression of IR and IRS-1 protein levels respectively, as compared with the SD group (100%) ($p < 0.05$). The stoichiometric rate of IRS-1 phosphorylation in the 307-serine aminoacyl residue was increased in DIO animals as compared to SD group ($145 \pm 9\%$ vs. $100 \pm 10\%$, respectively, $p < 0.05$). The Ut treatment reduced the serine phosphorylation of IRS-1 by 25% and by 40%, in the liver of DIO and of ob/ob mice respectively. The Ut treatment improved the inflammatory balance in the liver of both obese animals. There were 20% reduction in the pro-inflammatory index (mRNA IL1b/IL10) associated to 12% reduction in the pro-macrophage activation (mRNA F4/80/Arginase1) in the DIO mice, and even more pronounced reduction in the pro-macrophage activation to 40% in the ob/ob. Results herein reported prompted to the conclusion that the improvement in insulin sensitivity induced by the *Uncaria tomentosa* crude extract is associated with a reduction in inflammatory index in the liver of obese mice.

Biography

Layanne C C Arauj has her graduation degree in Biomedicine, Masters in Cell and Molecular Biology and she is currently a Doctoral student in Human Physiology at the Biomedical Sciences Institute of the University of São Paulo, working on various subjects like obesity, insulin resistance, hepatic steatosis and intestinal microbiota in the Laboratory of Intracellular Signaling.

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