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### Oral administration of leptin for the control of food intake and weight management

Leptin plays fundamental roles regulating appetite and energy expenditure. Originally discovered as an adipokine, it is also secreted by the gastric chief cells in an exocrine regulated fashion. To overcome the harsh conditions of the gastric juice it is complexed to a chaperon, the soluble isoform of its receptor. The released leptin-leptin receptor complex is channeled towards the intestinal lumen. Leptin is then internalized by the duodenal enterocytes, transcytosed and released towards circulation to reach target cells. The physiological presence of leptin in the gastric juice led us to put forward the proposal of an oral administration of leptin. Oral leptin administered in an appropriate vehicle that protects from early degradation by gastric and pancreatic juices and promotes internalization by the intestinal cells, led to its rapid appearance in circulation. Once administered to normal and obese mice, oral leptin decreased food intake by 60% and significantly reduced body weight. The effects were proportional to the administered amounts. By adjusting these, we were able to reduce and stabilize body weight in ob/ob obese mice for long periods of time. Studies with dogs using an oral tablet containing leptin with the different components that protect and promote leptin internalization, has shown its efficiency in reducing food intake. Further studies demonstrated that oral leptin stimulated brown adipose tissue. It activates UCP1 and other mitochondrial enzymes for lipid oxidation, lipolysis and decreases in fat synthesis, leading to rapid reduction of body weight and adiposity. Taken together these results demonstrate that oral leptin reaches blood circulation and target cells very efficiently. Besides acting as a satiety hormone reducing appetite and decreasing food intake, oral leptin triggers lipolysis for the overall major loss of body weight.

### Speaker Biography

Moise Bendayan Full Professor Department of Pathology & Cell Biology, Faculty of Medicine Université de Montréal, Montreal Quenbec Canada 1976: Ph.D. Anatomy University of Montreal (Drs Rasio & Sandborn) 1976-1979 Post-doctoral training, Département de Morphologie Université de Genève (Dr Orci ) 1981-1982 Institut de la recherche sur le cancer Villejuif France (Dr Puvion) 1987 and 2006 Sabbatical at the Diabetes Unit, Hadassah Hospital Hebrew University Jerusalem, 1979-Assistant Professor University of Montreal 1988- now Full Professor 1990-98 Chair Department of Anatomy-Cell biology Membre du Montreal Diabetes Center Research grants from: CRM, IRSC, FRSQ, Heart Fondation, Juvenile Diabetes Foundation, NIH, Diabete Quebec and others Average 150,000-200,000$/year + millions in equipment Publications by December 2016. 21 book chapters 290 original articles in peer reviewed journals (Nature, Science, Journal of Cell Science) 291 Congress Abstracts. Administration :Chairman of the Department Member of many Scientific Associations among which : President of the American Histochemical Society , Vice President of the Canadian Anatomists ,President and Member of the CIHR, FRSQ. Diabete Quebec…research committees Research on Endocrinology, Diabetes, Obesity, Cell and Molecular Biology since 1972

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