PRL-INDUCED IMPROVEMENT OF β-CELL FUNCTION: IS Cx36 A PLAYER?

Helena Pontes, Anne Charollais, Dorothée Caille, Paolo Meda

Department of Cell Physiology and Metabolism, Faculty of Medicine, Centre Médical Universitaire, University of Geneva, Rue Michel-Servet 1, 1211 Geneva 4, Switzerland

Email: Helena.DeOliveiraPontes@unige.ch

Pregnancy is the only physiological state in which pancreatic β-cell mass and function are naturally enhanced. The increase in plasmatic prolactin (PRL) that occurs during this period is thought to mediate these beneficial effects.

The objective of this work is to investigate whether these beneficial effects of PRL on β-cells are mediated by Cx36, a gap junction protein known to modulate β-cell function.

PRL effects were evaluated *in vitro* on MIN6 cells exposed to PRL and *in vivo* on 18th days pregnant C57BL6 mice and OFA rats (physiologically hyperprolactinemic). The following parameters were evaluated: Cx36 expression (by RT-PCR and Western Blotting), insulin release (by RIA and ELISA) and cell-to-cell coupling (by fluorescent dye microinjection).

PRL exposure slightly increased Cx36 mRNA. However, the protein levels, evaluated by WB, did not change. Strikingly, the number of Cx36-formed gap junctional plaques showed a 3-fold increase, and the cell-to-cell coupling was also increased 2.7 times, indicating an increase in Cx36 function after PRL exposure. In addition, PRL also increased insulin release *in vitro* and the number of insulin immunopositive cells.

The increase in Cx36 plaques with PRL was also observed *in vivo*. In pregnant mice and rats, Cx36 increased 2- and 1.2-fold, respectively, when compared to non-pregnant animals. Dye coupling was also increased 2-fold in islets isolated from pregnant rats.

The results suggest that Cx36 is one of the players mediating the beneficial effects of PRL on β-cell function, due to its influence on insulin secretion.