

Studies on ganglion cell-like (GL) cells in the skin of Djungarian hamsters (*Phodopus sungorus*)

(ジャンガリアンハムスター (*Phodopus sungorus*) の
皮膚神経節細胞様 (GL) 細胞に関する研究)

Abstract

Graduate School of Veterinary and Life Science
Nippon Veterinary and Life Science University

Rei Nakahira

Under Supervisor of
Prof. Dr. Kimimasa Takahashi

Specific cells that are called ganglion cell-like (GL) cells have been known to be present in the dermis of the abdominal and thoracic skin of Djungarian hamsters (*Phodopus sungorus*), however, the detailed nature and function of GL cells remain unclear. In this study, the author tried to confirm the *in vivo* reactivity of GL cells to androgen, paying attention to the fact that GL cells express androgen receptor (AR) and find out a lectin specific to GL cells by lectin histochemistry and thereafter identify the core protein modified with its lectin-binding sugar chains by MALDI-TOF MS analysis and western blotting.

To assess the microscopic changes of GL cells following gonadectomy, growth grade, distribution, and proliferative activity in gonadectomized and intact animals were evaluated. The poor growth was characterized in gonadectomized animals as compared with intact animals and this tendency was remarkable in gonadectomized males. Next, gonadectomized animals were given at low-dose (5mg/kg) or high-dose (20mg/kg) of testosterone propionate (TP) subcutaneously once every week for short-term (12 wks) or long-term (24 wks) period and the changes of GL cells were histologically evaluated. In all of the short-term and long-term TP treated groups, an increase in growth grade, thickness and proliferative activity of GL cells was found in a dose-dependent manner. The results indicate that the growth of GL cells is influenced a great deal by androgen.

By lectin histochemistry, GL cells were shown to specifically react with WGA and succinylated WGA lectin. Subsequently the glycosylated proteins eluted from the abdominal skin tissue were purified using WGA lectin affinity column. MALDI-TOF MS analysis and western blotting revealed the presence of β -actin and MGAT2 as WGA-binding proteins. Therefore, it is suggested that these proteins in GL cells were glycosylated with *N*-acetylglucosamine and/or sialic acid.

In conclusions, the growth of GL cells depends on androgen. In the future, the specific reactivity with WGA lectin may be available as a new marker of GL cells to elucidate the functional role of the cells.