

An immunohistochemical study of TLR-4 and -7 expression during murine embryonic development: respiratory apparatus and peripheral nervous system

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Toll-Like receptors (TLRs) are the mammalian orthologue of the type-I transmembrane receptor Toll originally identified in *Drosophila* for its function in embryonic developmental patterning [1]. In mammals, TLRs are known to function in innate immunity by recognizing molecular motifs unique to pathogens or injured tissue. However, literature data are emerging about a morphogenetic role of TLRs during development also in mammals, in particular of the nervous system [2]. We assessed TLRs expression in murine peripheral nervous system during the embryonic development, focusing on the innervation of the respiratory apparatus. Mouse embryos from stages E12 to E18 were excised, fixed in paraformaldehyde and paraffin embedded. Immunohistochemical stainings were performed to study the expression of TLR4 and TLR7, and to visualize the developing peripheral nervous system by the neural marker beta-3 tubulin. TLR7 immunoreactivity was already present at E12 in the dorsal root ganglia (DRG) and in the nodose ganglion and, by E14, in the sympathetic ganglia (PVG), vagus nerve, and also in nervous fibers and ganglia in the respiratory apparatus. Instead, TLR4 started to be weakly detected at E14 in DRG, PVG, and vagus nerve and, by E17, also in the smooth muscle, nervous fibers, and little ganglia of the respiratory apparatus. In conclusion the earlier expression of TLR7 could suggest for this receptor a role in the developmental processes while, the late detection of TLR4 might indicate it is most probably related to the maturation of immunity mechanisms in preparation for birth.

References

- [1] Anderson et al. (1985). Establishment of dorso-ventral polarity in the *Drosophila* embryo: genetic studies on the role of the Toll gene product. *Cell*. 42: 779-89.
- [2] Ma et al. (2006). Toll-like receptor 8 functions as a negative regulator of neurite outgrowth and inducer of neuronal apoptosis. *J Cell Biol*. 175: 209-15.

Key words

Toll-Like Receptors, embryonic development, respiratory apparatus, peripheral nervous system.