

## Thrombin receptor PAR-1 is a glial cell receptor involved in the regeneration of peripheral nerves

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Thrombin, a multifunctional serine protease, is a key enzyme in the coagulation cascade. Most of its actions are mediated by a G protein-coupled protease activated receptor (PAR-1) which is highly expressed in glial cells especially after injury (Pompili et al., 2006; Pompili et al., 2011).

In the peripheral nerves thrombin and PAR-1 specific agonist peptides produce changes in nerve conduction compatible with a conduction block. Aim of the present study is to determine if the activation of this receptor affects the neurotrophic properties of Schwann cells.

In peripheral nerves PAR-1 was predominantly observed by immunofluorescence on non-compacted Schwann cell microvilli at the node of Ranvier. Moreover, PAR-1 was highly expressed in Schwann cell cultures obtained from both neonatal and adult rat sciatic nerves. When PAR-1 specific peptides were added to these cultures an increased proliferation rate was observed. The synthesis and secretion of several growth factors by Schwann cells treated with PAR-1 agonist peptides were studied by RT-PCR, western blot and proteomics analyses.

Supported by PRIN 2008 - prot. 20089MANHH\_003

### References

- Pompili et al. (2006) PAR-1 upregulation by trimethyltin and lipopolysaccharide in cultured rat astrocytes. *Int J Mol Med* 18 (1): 33-39.
- Pompili et al. (2011) Protease-activated receptor-1 expression in rat microglia after trimethyltin treatment. *J Histochem Cytochem* 59(3): 302-11.

Keywords: Thrombin, protease activated-receptor, Schwann cells, peripheral nerve, regeneration.