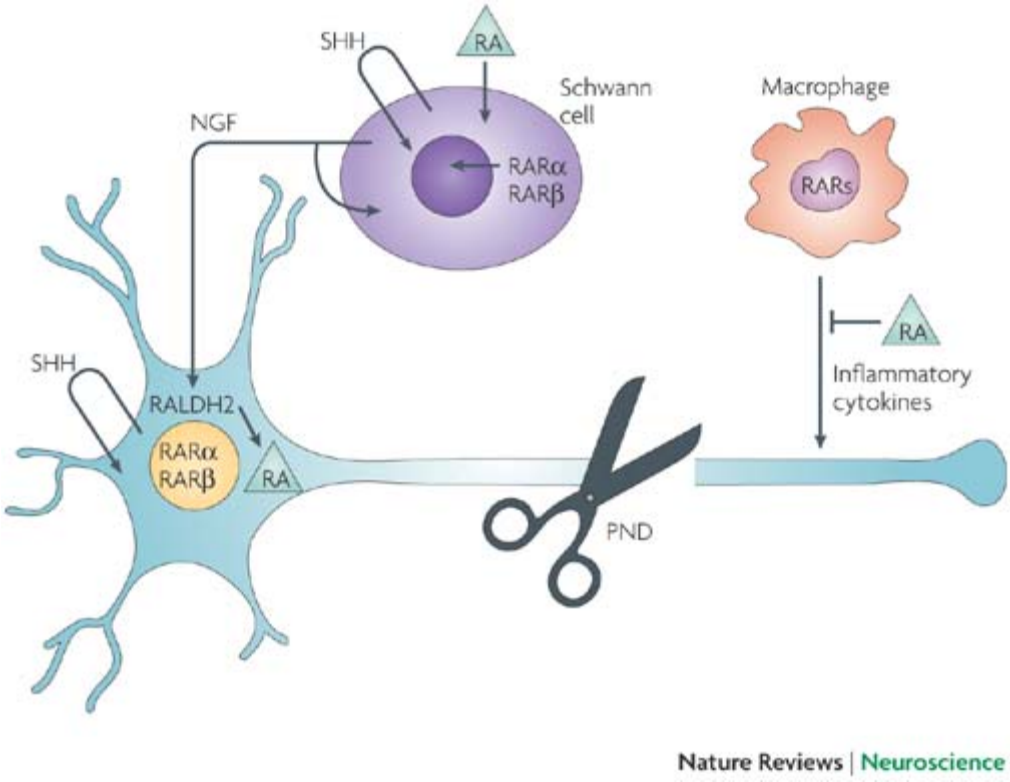
A summary of some of the molecular and cellular interactions that are induced following peripheral nerve damage (PND).

From the following article: Retinoic acid in the development, regeneration and maintenance of the nervous system

Malcolm Maden // Nature Reviews Neuroscience 8, 755-765 (October 2007)



Macrophages express retinoic acid receptors (RARs) and generate inflammatory cytokines, the production of which is inhibited by retinoic acid (RA). Schwann cells express RARs and sonic hedgehog (SHH). Neurotrophins, for example, nerve growth factor (NGF), are induced after PND, and can act in both a paracrine fashion on the neuron and an autocrine fashion on the Schwann cell itself. Damaged neurons are stimulated (possibly by neurotrophins from the Schwann cells) to produce RA from retinaldehyde dehydrogenase 2 (RALDH2), and also to produce SHH, which acts to supplement the beneficial effects of RA on axonal regeneration.