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Somatostatin Mediates Nitric Oxide Production by Activating SST2 Receptors in the Rat Retina

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AIM

The role of somatostatin (SRIF) in retinal circuitry remains to be elucidated. We recently reported the colocalization of sst2A and sst2B receptors with NADPH-diaphorase in rod bipolar and photoreceptors cells, respectively (Vasilaki et al., IOVS,42:1600-1609, 2001). The purpose of his study was to investigate further the localization of the SRIF receptor subtypes, sst1, sst3-sst5, and their possible involvement in the regulation of nitric oxide production in rat retina.

METHODS

Polyclonal antibodies raised against sst1, sst3-5 were applied to 10-14 μm cryostat sections of rat retinas fixed in paraformaldehyde. NADPH – diaphorase reactivity was assessed histochemically. The levels of nitric oxide in rat retinal explants were assessed by the production of its stable metabolites NO_2^- and NO_3^-.

RESULTS

sst1 immunofluorescence was detected mainly in the retinal pigment epithelium (RPE), blood vessels of the inner retina, where it was colocalized with NADPH-diaphorase, and in processes of the inner plexiform layer (IPL). sst4 immunohistochemistry was found in the IPL, ganglion cell bodies and processes where it was found to be colocalized with NADPH-diaphorase, and the optic nerve. sst3 and sst5 immunostain was not detected. Somatostatin increased nitric oxide production by 154% and this effect was mimicked only by an sst2 analog.

CONCLUSIONS

These results present conclusive evidence that somatostatin's role in the retina involves the regulation of nitric oxide production.