The peculiar structure of the notochordal sheath and its biochemical composition in dogfish Scyliorhinus canicula L. were studied using transmission electron microscopy, histochemical and immunohistochemical techniques. The notochordal sheath surrounds notochord and it is the product of the notochordal cells. The notochord defines all Chordates, and plays an important role in the vertebrate development. It is the main skeletal element of an embryo and it induces the formation of the surrounding tissue during early embryogenesis. In dogfish Scyliorhinus canicula L., the notochordal sheath separates the cartilaginous vertebra from the underlying notochordal cells (Fig. 1A) and it is a layer made of collagen fibrils (Fig. 1B). The part of the sheath close to the marginal notochordal cells, consists of electron dense material (Fig. 1A and 1B) presumed to be the elastic fibers which was then confirmed by using Verhoeff's staining (Fig. 2A). This structure is known as elastic membrane in notochordal sheath of some other vertebrates. Some membrane pores could be seen all along the elastic membrane (Fig. 1A and 1B). The elastic membrane is more resistant to degenerating processes than notochordal sheath itself (Fig. 1C). The outer part of the sheath, close to the cartilaginous matrix, contains collagen type 1, which was confirmed by using antibody to collagen type 1 (Fig. 2B). Contrary, the hyaline cartilage in the vertebra wasn't labelled by antibody to collagen type 1. The inner part of the notochordal sheath was also positive to antibody to intermediate filament vimentin when using the immunofluorescence technique (Fig. 2C).

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Fig. 1: (A) Notochordal sheath (ns), elastic membrane (arrow), pores (arrowheads), notochordal cells (nc), vacuoles (v). Scale bar: 5 µm. (B) Collagen fibrils (arrow), elastic membrane (em), notochordal cells (nc), vacuoles (v). Scale bar: 1 µm. (C) Degenerating sheath (arrow) with conserved elastic membrane (arrowhead). Scale bar: 10 µm.

Fig. 2: (A) Collagen fibrils (arrowhead) and elastic membrane (arrow). Verhoeff staining. Scale bar: 25 µm. (B) Collagen type 1 (arrowhead), centrum of the vertebra (cv), elastic membrane (arrow). DAB. Scale bar: 50 µm. (C) Positive staining to vimentin (arrow), notochord (n), centrum of the vertebra (cv). Alexa fluor. Scale bar: 25 µm.