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Developmental Biology

Volume 82, Issue 2, March 1981, Pages 267-286

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Immunocytochemical localization of fibronectin in embryonic chick trunk and area vasculosa ☆

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https://doi.org/10.1016/0012-1606(81)90451-6

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Abstract

Fibronectin has been shown to enhance cell migration *in vitro*. It seems of considerable interest, therefore, to map its distribution in the actual embryo during periods of cell migration. In this *in situ* study, we used immunohistochemistry at the electron microscopic level to localize fibronectin in three regions of the chick embryo that are characterized by actual or impending morphogenetic movements: dorsal trunk (neural crest), ventral trunk, and area vasculosa. The extracellular matrix of the 2-day-old embryo contains nonstriated fibrils (5–10 nm in diameter) and so-called interstitial bodies, both of which label by antibodies to fibronectin with the immunoperoxidase (PAP) technique and with the immunoferritin technique. In addition, cell surfaces and basal laminae are strained by PAP following treatment with antifibronectin. Using ruthenium red to preserve proteoglycan (PG), we were able to demonstrate a close association of PG granules with the periphery of the fibronectin-rich interstitial bodies. These results are the first to indicate the possible chemical composition of interstitial bodies and they raise the possibility that these unique components of embryonic matrices are important substrates for cell migration. Indeed, cell processes of neural crest and other mesenchyme make close contacts with interstitial bodies. In the area vasculosa, interstitial bodies are concentrated at the leading edge of the vascular mesenchyme. There is, however, no obvious gradient of extracellular fibronectin in neural crest pathways or in the ventral trunk.

Abbreviations

anti-R, goat anti-rabbit IgG; CSP, cell surface protein; DAB, diaminobenzidine; ECM, extracellular matrix; Fab, the antibody-binding fragment of IgG; Fc, the non-antibody binding fragment of IgG; Fe-anti-R, ferritin-conjugated goat anti-rabbit IgG; GAG, glycosaminoglycans; IgG, immunoglobulin G; LETS, large, external, transformation-sensitive protein; PAP, peroxidase anti-peroxidase; PBS, phosphate-buffered saline (pH 7.2); Ranti-FN, rabbit antifibronectin antiserum; RR, ruthenium red; SDS, sodium dodecyl sulfate; SFA, fibroblast surface antigen; TBS, Tris-buffered saline

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☆ This work was supported by an NIH Postdoctoral Fellowship to Byrne W. Mayer and NIH Grants HD00143 and CA17007 to Elizabeth D. Hay and Richard O. Hynes, respectively, and NSF Grant PCM 7816158 to Elizabeth D. Hay.

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