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The ribonucleoprotein nature of the rapidly labeled RNA in the embryonic retina ☆

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Abstract

Embryonic neural retina tissue in culture was pulsed with uridine-5-^{3}H and the rapidly labeled RNA-containing particles in the cytoplasm, sedimenting in the subribosomal (20 S–70 S) and in the polysomal region, were examined. All of the rapidly labeled RNA in the subribosomal region was in the form of RNP, as evidenced by its retention on Millipore filters without precipitation with trichloroacetic acid. The rapidly labeled RNA in these subribosomal RNP particles was nonribosomal in character and its sedimentation and other properties were similar to those of polysomal mRNA. Kinetic data suggest that the rapidly labeled RNA first appears in the subribosomal region and then in the polysomal region.

Polysomal mRNA was obtained by dissociating polysomes with EDTA or with KCl, and the released message was examined for the presence of protein. Buoyant density analyses of polysomes obtained by fractionation in sucrose gradients, under conditions favoring optimal labeling of mRNA and minimal labeling of ribosomal RNA, showed that only about 50% of the total radioactivity was represented by the polysome-bound message. The rest was in nonpolysomal RNP particles which cosedimented with the polysomes. The nonpolysomal RNP particles were resistant to EDTA and in CsCl gradients banded in a less dense region than intact or dissociated polysomes. Their buoyant density was very similar to that of the subribosomal RNP particles, both corresponding to a protein content of 55–60%. mRNA released from polysomes by treatment with EDTA was found to be associated with protein; it banded at a buoyant density of 1.51, corresponding to a protein content of about 50%.

Abbreviations

RNP, ribonucleoprotein; mRNP, messenger ribonucleoprotein; S15, 15,000 *g* supernatant of cell homogenate; TCA, trichloroacetic acid; SDS, sodium dodecyl sulfate; EDTA, ethylene-diaminetetraacetate (disodium salt)

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