



## RNA localization and transport (Review)

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### Abstract

RNA localization serves numerous purposes from controlling development and differentiation to supporting the physiological activities of cells and organisms. After a brief introduction into the history of the study of mRNA localization I will focus on animal systems, describing in which cellular compartments and in which cell types mRNA localization was observed and studied. In recent years numerous novel localization patterns have been described, and countless mRNAs have been documented to accumulate in specific subcellular compartments. These fascinating revelations prompted speculations about the purpose of localizing all these mRNAs. In recent years experimental evidence for an unexpected variety of different functions has started to emerge. Aside from focusing on the functional aspects, I will discuss various ways of localizing mRNAs with a focus on the mechanism of active and directed transport on cytoskeletal tracks. Structural studies combined with imaging of transport and biochemical studies have contributed to the enormous recent progress, particularly in understanding how dynein/dynactin/BicD (DDB) dependent transport on microtubules works. This transport process actively localizes diverse cargo in similar ways to the minus end of microtubules and, at least in flies, also individual mRNA molecules. A sophisticated mechanism ensures that cargo loading licenses processive transport.

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