ABSTRACT

The majority of pri-miRNAs acquire 5′ cap and 3′ poly(A) tail. Mature miRNAs recruit deadenylases that erode poly(A) tails triggering target mRNA degradation. Poly(A)-specific ribonuclease (PARN) is a deadenylase that also mediates late steps of non-coding RNA maturation. Herein, we show that PARN affects the expression of a subset of miRNAs in NCI-H520 cells of lung cancer origin, including miR-29a and miR-1207 that target its own mRNA. PARN precipitates with selected pri-miRNAs and regulates their poly(A) lengths. Cleavage and polyadenylation specificity factor 6 (CPSF6) recruits PARN to pri-miRNAs and together affects pri- and mature miR-29a-3p and miR-1207 levels. Vice versa, miR-29a-3p and miR-1207 bind the 3′ UTR of PARN mRNA and regulate its expression. Modulation of PARN, miR-29a-3p or miR-1207 expression affects cell migration. We present a model to describe the dynamic relation between PARN and miR-29a-3p and discuss its biological significance.