

Function of cytosine-5 RNA methylation in translation

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Many of the hundreds of known chemical modifications in RNA were discovered over forty years ago but then forgotten because suitable, sensitive tools to detect the modifications at high resolution were lacking. Through the development of novel biochemical, functional and genomics tools we are only now beginning to understand the whole breadth and extensive functional roles of RNA modifications in higher organisms. I will present some mechanistic examples how RNA modifications help to shape normal tissue homeostasis, and how aberrant formation of RNA modifications contributes to human diseases. I will focus on the functional roles of 5-methylcytosine (m5C) in regulating gene expression and present and discuss novel and emerging molecular functions of RNA modifications in RNAs. Together, our work demonstrates that by understanding the role of RNA modifications in physiology and pathology, novel therapeutic strategies for human diseases can be identified and further optimized for clinical studies.