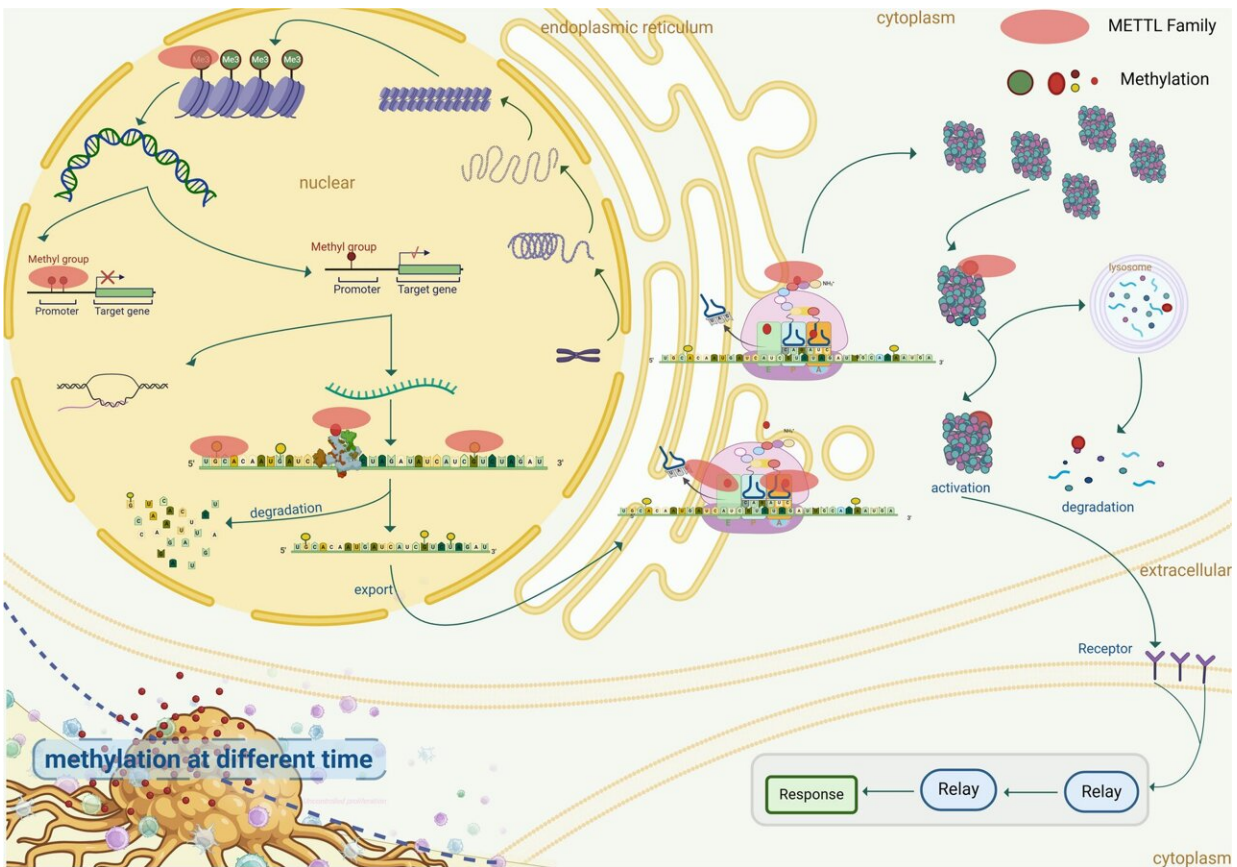


# METTL family: A key regulator of cellular function in health and disease

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Modifications Involved in The Process of Gene Expression: From Transcription to Protein Activation and Depolymerization. Numerous processes are involved in gene expression. Histone modifications facilitate DNA transcription. DNA, in turn, undergoes modifications within proteins. mRNA modification is employed for nuclear and cytoplasmic localization. Once mRNA is in place, its modifications aid translation and facilitate the folding of the synthesized polypeptide chain, promoting protein activation and depolymerization. Credit:

A review [published](#) in the journal *Molecular Biomedicine* provides a comprehensive overview of the METTL family, a group of methyltransferase-like proteins crucial for cellular function. METTL family members are widely distributed across the cell nucleus, cytoplasm, and mitochondria. They play a vital role in regulating gene expression by transferring methyl groups to DNA, RNA, and proteins, thereby affecting processes such as DNA replication, transcription, and mRNA translation.

The review highlights the involvement of the METTL family in both physiological and pathological conditions. It discusses their role in normal cell differentiation, maintaining mitochondrial function, and their implication in malignancies, neurodegenerative disorders, and cardiovascular ailments. The review was led by Dr. Jiejie He, Jun Zhang, and Yan Li (Department of Gynecologic Oncology, Affiliated Hospital of Qinghai University).

Key findings from the review include:

- METTL family members are essential for cell differentiation. They play a role in maintaining stem cell pluripotency and promoting differentiation into various cell types.
- METTL family members are crucial for [mitochondrial function](#). They regulate mitochondrial DNA methylation, promote mitochondrial translation, and influence the composition and function of the mitochondrial respiratory chain.
- Dysregulation of the METTL family is linked to various diseases. This includes cancer, neurological disorders, and cardiovascular diseases.

The review emphasizes the potential of the METTL family as crucial diagnostic and therapeutic markers. Future research directions include developing drugs or antibodies targeting specific METTL family members and exploring the use of nanomaterials to deliver miRNA corresponding to METTL family mRNA.

**More information:** Jiejie He et al, METTL Family in Healthy and Disease, *Molecular Biomedicine* (2024). [DOI: 10.1186/s43556-024-00194-y](https://doi.org/10.1186/s43556-024-00194-y)

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