

CryoEM snapshots of the spliceosome provide insights into the molecular mechanism of pre-mRNA splicing

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Most protein-coding genes in eukaryotes require the removal of non-coding sequences (introns) from precursor messenger RNA (pre-mRNA) and the splicing together of coding sequences (exons) to produce functional mRNAs. Introns are removed from pre-mRNA in two consecutive phosphoryl transfer reactions by an intricate molecular machine known as the spliceosome. The major components of the spliceosome are U1, U2, U4/U6 and U5 small nuclear ribonucleoprotein particles (snRNPs). These snRNPs and numerous protein factors assemble *de novo* around each intron on pre-mRNA substrates. The fully assembled spliceosomes do not contain pre-formed active site and is remodelled extensively to form the active site. In the last three years we (ref. 1-6) and others have obtained snapshots of the spliceosome in several key steps by cryoEM single particle analysis. These structures have provided important insights into the mechanism of assembly, activation, catalysis and disassembly of the spliceosome and advanced our knowledge of this crucial step of eukaryotic gene expression (7).

#### References

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