

Lawrence Berkeley National Laboratory

Recent Work

Title

Structural variability of RNA in a crystalline environment.

Permalink

<https://escholarship.org/uc/item/4263m321>

Author

Holbrook, Stephen R.

Publication Date

2000-07-13

Holbrook, S.R. Structural Variability of RNA in a Crystalline Environment. Structural Biology Department, Physical Biosciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720.

Two crystal structures of RNA duplexes incorporating tandem G-A pairs and the crystal structures of two variants of the Rev Binding Element (RBE) will be compared. In the two crystal structures of octamer duplexes with tandem G-A base pairs, there are six crystallographically independent examples (three per crystal structure). Of these six examples, five are closely related, while the sixth has a tightly bound magnesium ion in the minor groove and a bridging water molecule in the G-A pairs.

In one crystal structure of the RBE, there are four crystallographically independent duplexes belonging to two structural types. In the other RBE crystal structure, the conformation of the RNA is the same as one of these structural types.

NMR solution structures of both of these RNA sequences have been determined. In the regions of the molecules where sufficient, good quality NMR data are observed, the solution structures agree well with the crystal structures. However, in flexible regions where insufficient NMR restraints are available, modeling may lead to incorrect structural features.

The effect of crystal packing, water and metal binding, and sequence variation on structural variability will be discussed. The correlation between conformational variability and temperature factors will also be explored.

RNA Structure
Santa Cruz, CA
July 12-16, 2000