

The Schlick lab RNA-As-Graphs Dual Graph Resource

Our dual graph resource (available at: http://www.biomath.nyu.edu/?q=rag/dual_vertices.php) consists of two parts as shown in Figure 1:

The first part lists the 94 dual graph topologies between 2-9 vertices that correspond to existing RNA structures in the representative RNA dataset. All existing dual graph topologies are shown on the corresponding vertex page. For example, Figure 2 shows the 6 existing dual graph topologies with 3 vertices. RNA structures and chains from the representative dataset corresponding to each existing dual graph topology are also listed. For example, Figure 3 shows the list of 8 RNA PDB files and chains that correspond to the dual graph topology 3_2.

The second part contains the link to download the *RAG-3Dual database* (as a single zipped file), that contains the non-separable subgraph blocks and corresponding RNA atomic fragments. These non-separable blocks are obtained by applying dual graph partitioning to the 2D structures in the representative RNA dataset (≥ 2 vertices). The atomic fragments are cataloged based on their dual graph IDs.

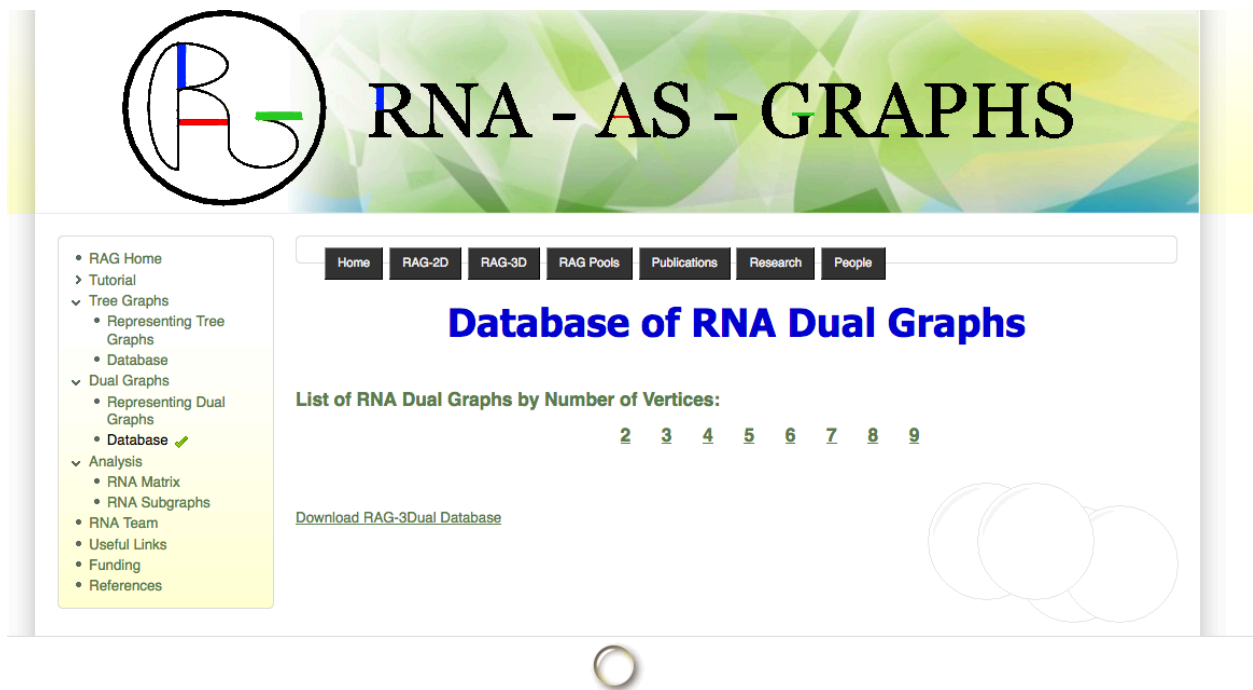


Figure 1: Two parts of our dual graph resource.

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Database of RNA Dual Graphs

List of RNA Dual Graphs by Number of Vertices:

[2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#)

[Download RAG-3Dual Database](#)

3 VERTICES

Number of Possible RNA Topologies: 8
Number of Motifs Found: 6
Number of Missing Motifs: 2

To learn more about an RNA topology, please click on its graph.

These graphs have been ordered according to the second smallest eigenvalue of their Laplacian matrix (λ_2 is given).

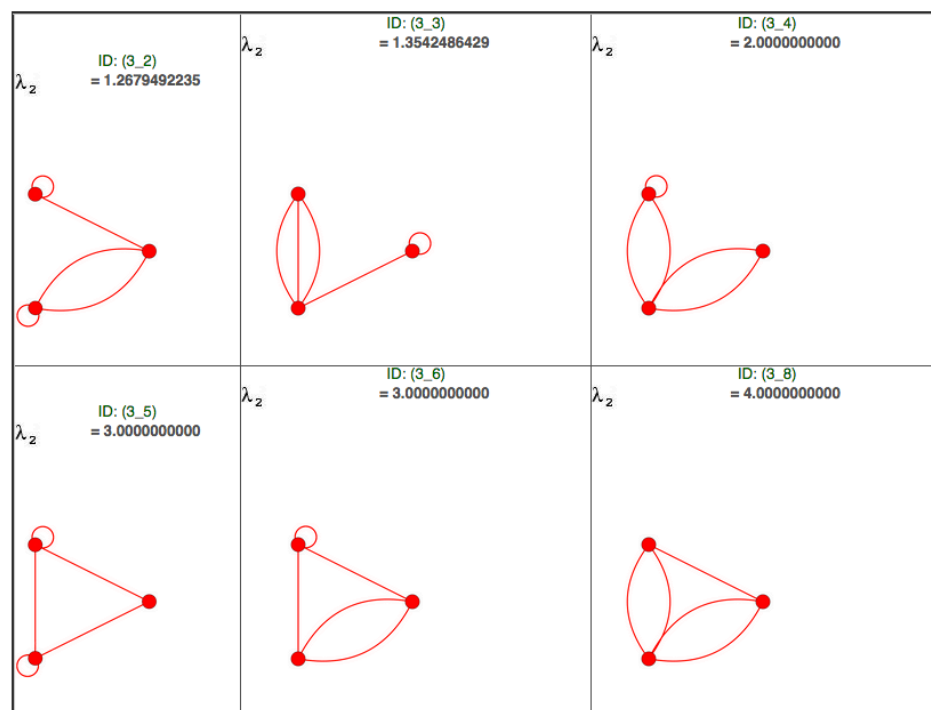
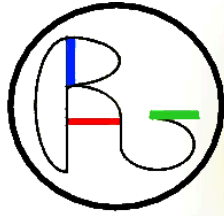


Figure 2: The 6 existing dual graph topologies with 3 vertices.

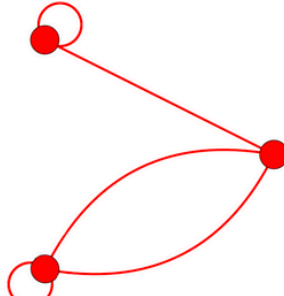


RNA - AS - GRAPHS

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Dual Topology: 3_2



Topological Aspects

- 3 Vertices

- Eigenvalues
- 0.0000000000
- 1.2679492235
- 4.7320508957

Examples of actual RNAs corresponding to this structure from RNA databases: 8

PDB_Chain	Type	Discovery Method
1M5K_E	RNA HAIRPIN RIBOZYME	X-RAY DIFFRACTION
3IZZ_A	Helix 5, 14, 15 (Small Subunit)	ELECTRON MICROSCOPY
3J0D_A	ribosomal 23S RNA	ELECTRON MICROSCOPY
3JCT_6	ITS2-1 miscRNA	ELECTRON MICROSCOPY
4PKD_V	U1 snRNA stem-loops 1 and 2 (55-MER)	X-RAY DIFFRACTION
4WZJ_YYYY	U4 small nuclear RNA variant	X-RAY DIFFRACTION
5CZZ_B	RNA (73-MER)	X-RAY DIFFRACTION
5WSG_E	Saccharomyces cerevisiae S288c SNR6 snRNA	ELECTRON MICROSCOPY

Figure 3: List of RNA PDB files and chains corresponding to the existing dual graph topology 3_2.