

## ABSTRACT

**TETRAHEDRAL CHART OF THE 4 COMMONLY OCCURRING RNA BASES**

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The 4 commonly occurring RNA (Ribo Nucleic Acid) bases are: Adenine, Guanine, Cytosine, and Uracil. Adenine and Guanine are purines. Cytosine and Uracil are pyrimidines. In RNA, Adenine normally base pairs with Uracil, and Guanine normally base pairs with Cytosine. The 1-letter symbol for Adenine is A, the 1-letter symbol for Guanine is G, the 1-letter symbol for Cytosine is C, and the 1-letter symbol for Uracil is U.

A Platonic polyhedron is a polyhedron with congruent faces and the same number of faces meeting at each vertex. The 5 platonic polyhedrons are: the Tetrahedron with 4 faces, the Cube with 6 faces, the Octahedron with 8 faces, the Dodecahedron with 12 faces, and the Icosahedron with 20 faces.

Since there are 4 commonly occurring RNA bases and there are 4 faces to a tetrahedron, a useful heuristic device for learning and remembering the chemical structures, the names, and the 1-letter symbol for each RNA bases can be constructed by placing the chemical structure, the name, and the 1-letter symbol for each RNA base on a single face of a tetrahedron.

United States Design Patent Number US D755,287 S, by the author, entitled TETRAHEDRAL CHART OF THE 4 COMMONLY OCCURRING RNA BASES, shows what such a tetrahedron with the chemical structure, the name, and the 1-letter symbol for each RNA bases on each face of such a tetrahedron would look like from front, back, right, left, top, and bottom views. Design Patent US D755,287 S also contains a cut-and-assemble pattern which can be cut out and assembled to make the tetrahedron shown in the design patent.

Although the RNA bases themselves are achiral, the above described RNA base tetrahedron is chiral, existing in two possible enantiomeric configurations that are mirror images of each other.

Once the tetrahedron is assembled, it can be tossed at random like a 4-sided dice, reading out each face in contact with a flat surface, to generate random RNA base sequences. For example, one such random RNA base sequence that is 100 RNA bases long, which was generated by randomly tossing the RNA tetrahedron is: AGUCGAGG CAGUUCGUACAUAACAGACGUUACCUGUUGGCAUGUCAUUAUAAGUGUG AUUGCGCAAGCACGCGGUUAGUGGCGGAAUAUAUUGACGA.