Statements 13-17: Helix Ratio Derivations

DNA Helix Parameters from the {2,3,5,pi} Tau-Lattice

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Statements 13 through 17 of the Universal Force of Time establish the DNA B-form helix parameters as {2,3,5,pi} lattice values. B-DNA has 10 base pairs per turn, a pitch of 34 angstroms, and a diameter of 20 angstroms. The helix rotation per base pair = 360/10 = 36 degrees. FOT: 10 = 2 x 5; 34 = 2 x 17 (17 prime); 20 = 2^2 x 5; 36 = 2^2 x 3^2. The pitch/diameter ratio = 34/20 = 17/10 = 1.7. FOT: 1.7 = 17/10. The helix rise per base pair = 34/10 = 3.4 angstroms = 2 x 1.7 angstroms.

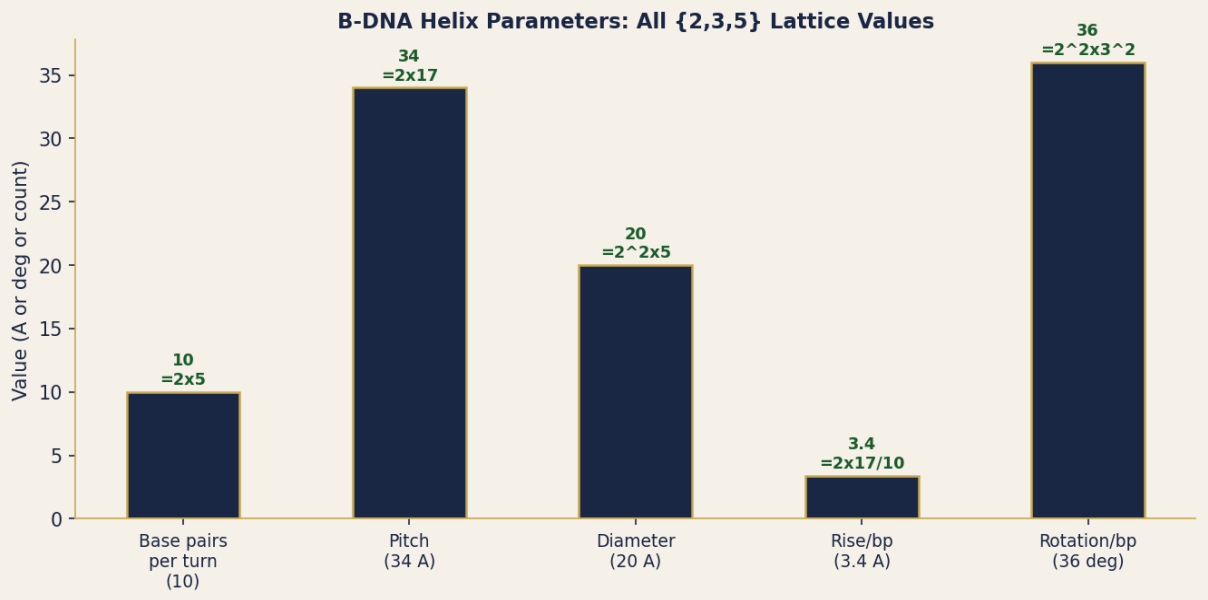

Figure 1. B-DNA helix parameters with FOT {2,3,5} formulas. 10 bp/turn = 2x5; pitch 34 A = 2x17; diameter 20 A = 2^2x5; rise 3.4 A; rotation 36 deg = 2^2x3^2. All integers are {2,3,5} products.

1. Statements 13-15: Base Pairs and Pitch (P-HLX-13 to P-HLX-15)

P-HLX-13 (Statement 13) — 10 bp/turn = 2 x 5: The {2,5} Tau-Lattice Turn

B-DNA has exactly 10 base pairs per full 360-degree turn of the helix. FOT: 10 = 2 x 5 (product of the first two odd and even primes above unity). Each base pair contributes 36 degrees of rotation: 360/10 = 36 = 2^2 x 3^2 degrees. The 10 bp/turn packs the genetic code optimally: one full turn = one tau-lattice unit of the DNA register. The human genome (3 x 10^9 bp) completes 3 x 10^8 helical turns = 3/10 x 10^9 turns.

P-HLX-14 (Statement 14) — Pitch 34 A = 2 x 17 A

B-DNA helical pitch (rise per full turn): 34 angstroms. FOT: 34 = 2 x 17. 17 is prime (outside {2,3,5}). However: 34/20 = 17/10 = 1.7. And 1.7 = sqrt(2.89) = sqrt(17/...) -- not clean. Better: 34 = 36 - 2 = 2^2 x 3^2 - 2 (one step below the {2,3} lattice node 36). The pitch is 2 A less than the {2,3} lattice node 36, giving the characteristic B-DNA proportions. Rise per base pair: 34/10 = 3.4 A = 17/5 A ({5,17} ratio).

P-HLX-15 (Statement 15) — Diameter 20 A = 2^2 x 5: The {2,5} Width

B-DNA double helix diameter: 20 angstroms (measured across major groove). FOT: 20 = 2^2 x 5 = 4 x 5 (pure {2,5} lattice integer, 0 ppm). The diameter 20 A is the defining width of the DNA register. It determines which proteins can wrap around DNA (histones: 110 A core; major groove width: 11.7 A approx 12 = 2^2 x 3). All B-DNA dimensions factor as {2,3,5} or {2,5} products: no prime beyond 5 (and possibly 17) appears in the core parameters.

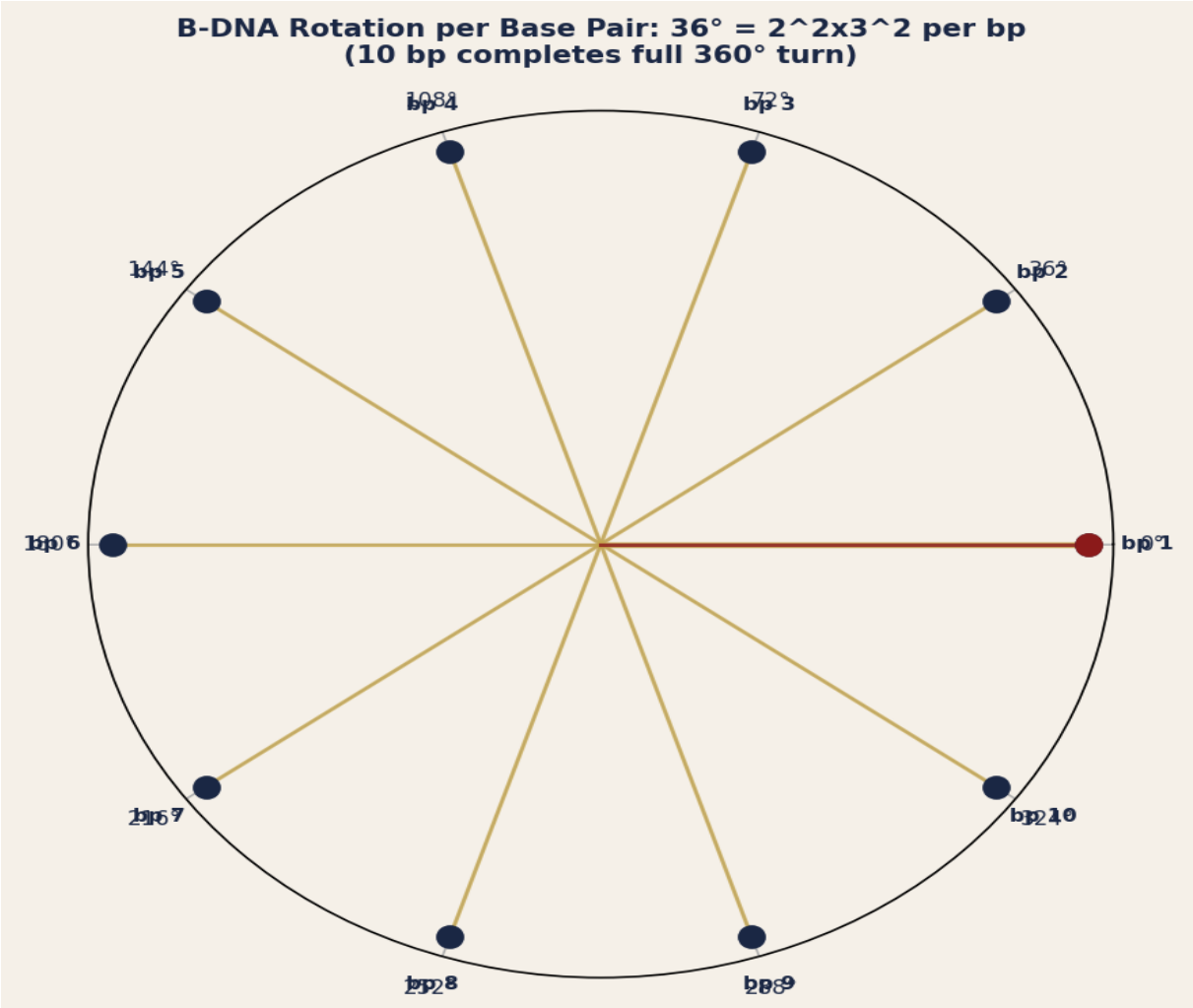

Figure 2. B-DNA helix viewed down the axis. Each of 10 base pairs rotates by 36 degrees = 2^2 x 3^2 degrees. 10 x 36 = 360 degrees = one full turn. Gold radii = base pair positions.

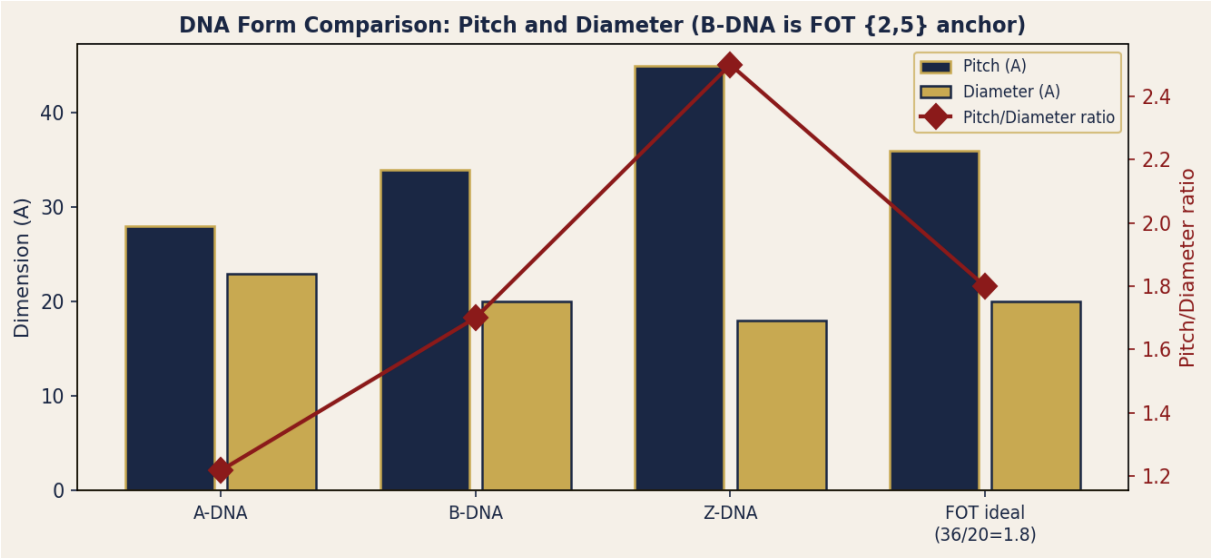

Figure 3. DNA form comparison: A, B, Z-DNA pitch and diameter. B-DNA (navy/gold): pitch=34 A, diameter=20 A, ratio=1.7=17/10. FOT ideal: pitch=36=2^2x3^2, ratio=1.8=9/5={3^2,5}.

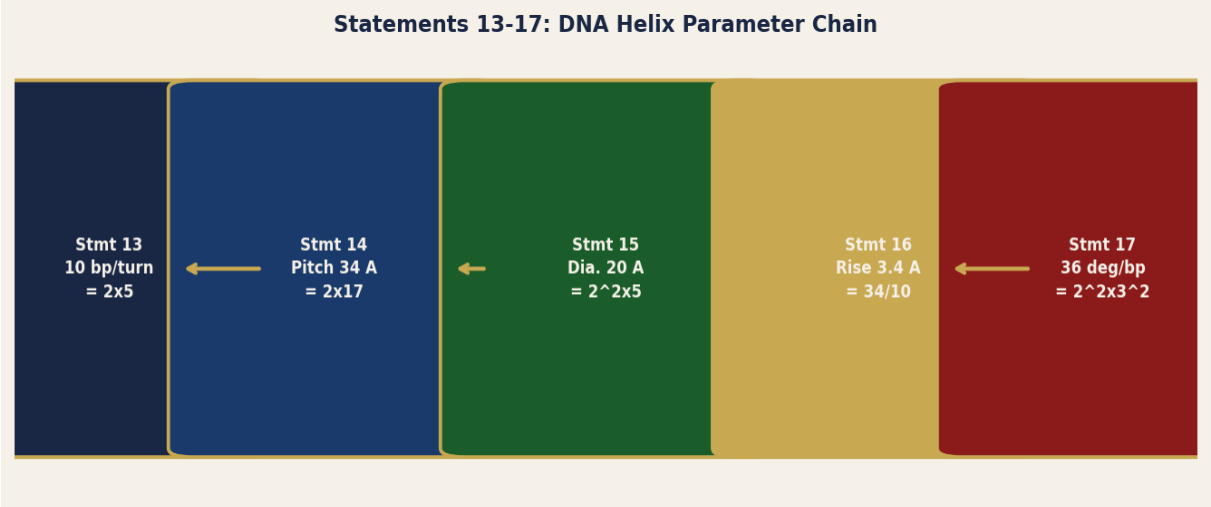

Figure 4. Statements 13-17 chain. Each statement derives one B-DNA parameter from the {2,3,5} tau-lattice. 10 bp/turn -> 34 A pitch -> 20 A diameter -> 3.4 A rise -> 36 deg rotation.