Adjustments to the freely-jointed chain model.

1) What is the random walk length? (Kuhn length, $b$)

Linear hydrocarbon polymers rotate by alternation between trans and gauche conformations.

Polyethylene:
- C-C bond length = 1.5 Å
- Kuhn length, $b = 1.4$ Å because of correlations

DNA (double helix):
- $b = 100$ nm ($70x$ larger than PE)

2) Excluded volume: 2 chain segments cannot overlap.

Result: $\sqrt{\langle r^2 \rangle} = a \cdot N^{\frac{3}{5}}$ (not $\frac{1}{2}$, as in ideal model) (Flory theory)

See homework #2 for a simplified ‘derivation’ of this result.