

• Clearly, the longer the Kuhn segments, the stiffer the chain.

Example: What is the mean square end-to-end distance for a molecule of  $\lambda$ -DNA?

For DNA,  $b \approx 110 \text{ nm}$

$\lambda = 48,502 \text{ bps}$

then:  $N \times l = N_b \times b$

$$48,502 \times 0.34 \text{ nm} = N_b \times 110 \text{ nm}$$

$$N_b = 150$$

then:

$$\begin{aligned} \langle l^2 \rangle_{\lambda\text{-DNA}} &= N_b \times b^2 \\ &= 150 \times (110 \text{ nm})^2 \\ &= 1.815 \times 10^6 \text{ nm}^2 \end{aligned}$$

$$\langle l^2 \rangle_{\lambda\text{-DNA}} = 1.815 \text{ } \mu\text{m}^2$$

Another characteristic dimension of a polymer is its radius of gyration.

A random coil, on the other hand, should adopt a globular configuration. Its radius of gyration