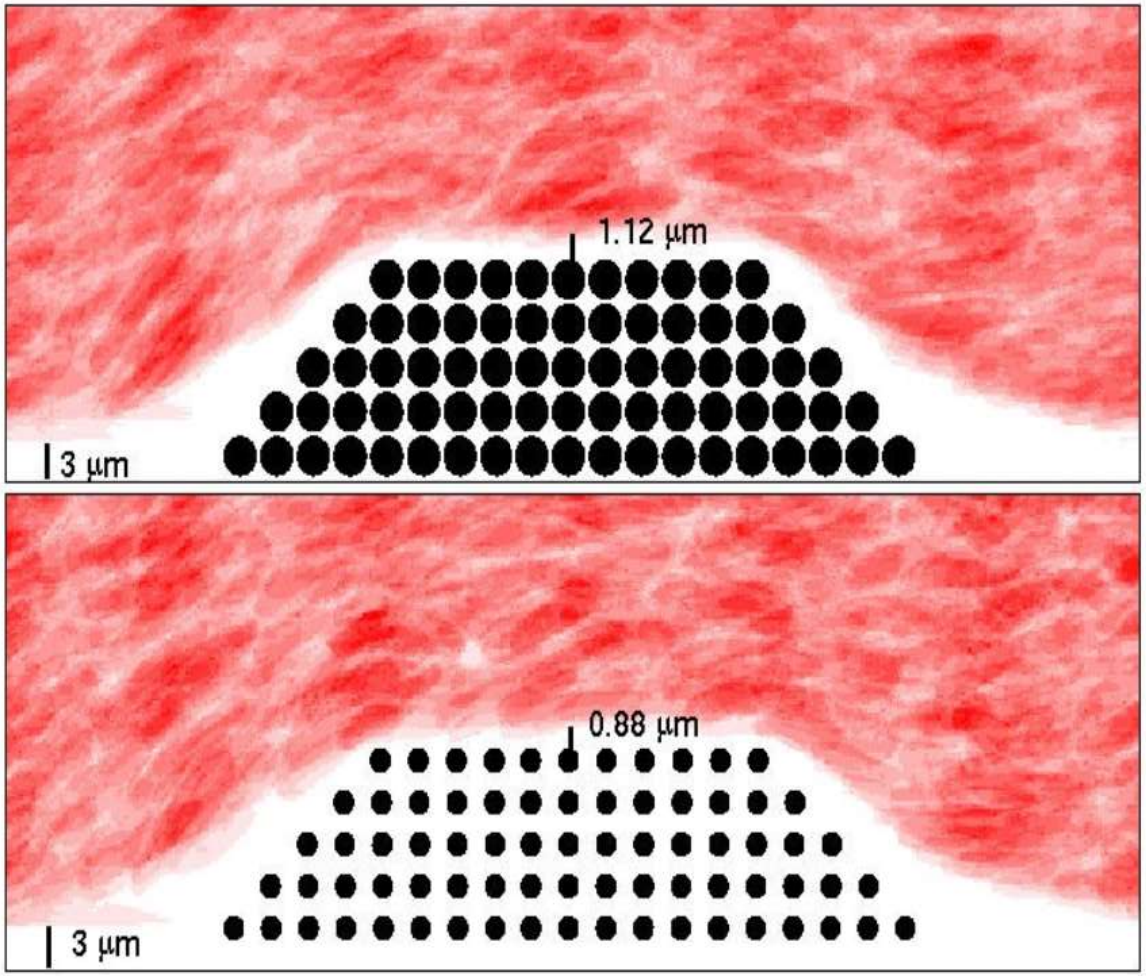
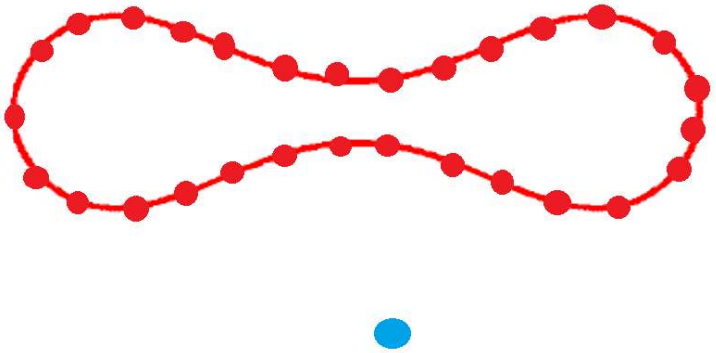
Porous clots



[2]

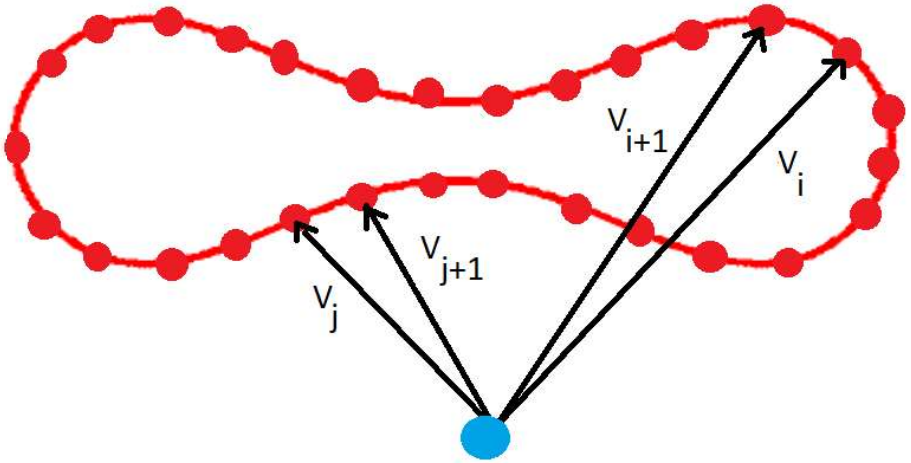
[2]T.S. L. Crowl, and A. Fogelson. Platelet motion near a vessel wall or thrombus surface in whole blood simulations. Biophysical Journal (2013).

an interesting problem



- In order to make image above we needed to know if a point was inside of a red blood cell.
- This is a famous problem called the Point-in-a-Polygon (PIP).

an interesting problem

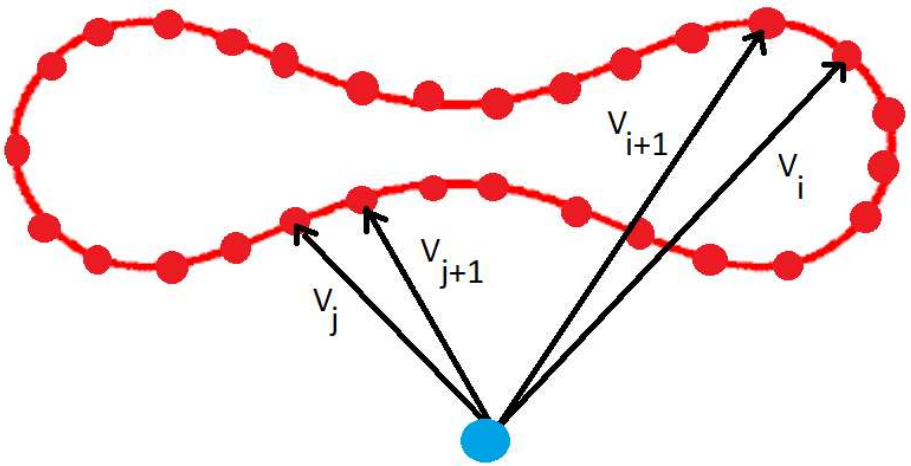


- Use the cross product to calculate angles subtended by edges.

$$\sin(\theta_i) = \frac{|v_i \times v_{i+1}|}{|v_i||v_{i+1}|}$$

- Note that the angle between v_i and v_{i+1}, θ_i, is positive.
- The angle between v_j and v_{j+1}, θ_i, is negative.

an interesting problem



- The winding number, W_n, is defined as

$$W_n = \sum_i \theta_i$$

- $W_n = 0$ means the point is outside the polygon, $W_n \neq 0$ means inside.
- We have so many points per RBC we save computation time by employing small angle approximation, $\sin\theta \approx \theta$.