[120BM0011]

Fahraeus - Lindqvist (FL) effect

This effect occurs in very less diameter tubes or blood vessels. It describes how the change in viscosity of fluid is related to the change in the diameter of the tube as velocity.

It is observed that the viscosity of the blood decreases when it passes through the vessels decreasing in diameter blood capillaries. This is generally observed in capillaries with diameter less than 0.3 mm.

So, the formula is,

$$Q = \frac{\pi R^4 \Delta P}{8 \mu_a L}$$

Q → volumetric flow rate
ΔP → pressure drop
L → Length of capillary
μ_a → effective viscosity
R → radius
π → constant

This effect becomes more visible as the diameter becomes comparable with the size of particles. Hematocrits suggest as the vessel diameter is reduced, the plasma cell free layer also increases as the increase in effective viscosity of whole blood. The flow is directly proportional to pressure difference and inversely proportional to apparent viscosity of blood.

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