

LETTER TO THE EDITORS

Further Comments on Cellular Pressure and Protoplasmic Elasticity

(Received 30 August 1974)

Dr. Hiramoto[1] in replying to my letter [2] described how the internal pressure of a cell must equal the external pressure to produce tangential stress at the surface that equals the external pressure; i.e. only when there is no difference of pressure across the membrane will there be no tangential stress in the membrane.

The prime purpose of the original paper on pressure in the cell[3] was to show that protoplasm can produce a thick-walled effect which reduces the internal pressure to a negligible value at the membrane. As a result, there is little difference of pressure across the membrane. This reduction of pressure does not necessarily happen in all cells at all times, but it can occur in some cells at some time; the possibility exists that a cell has a relatively large internal pressure without developing a significant stress in the membrane. A critical factor in determining these stresses is the amount of tangential stress carrying protoplasm which is affected by the structural condition of the whole cell. Depending on the stress capacity of the protoplasm, a significant internal pressure can produce an insignificant tangential stress in the membrane.

All the protoplasm does not have to have the same stress capacity and most likely there is variation within each cell, but the transposed protoplasm takes-up stress leaving variable quantities of residual pressure at the membrane.

6, Courtlandt Place
Houston, Texas 77006, U.S.A.

KARL DOERNER, JR

REFERENCES

1. Hiramoto, Y. *Biorheology* **10**, 75, 1973.
2. Doerner, K. *Biorheology* **10**, 75, 1973.
3. Doerner, K. *J. Theor. Biol.* **14**, 284, 1967.

ERRATUM

Puchelle, E. and Zahm, J. M.: Rôle de l'effet-bout sur la mesure de la viscosité de l'expectoration déterminée à l'aide d'un rhéomètre rotatif à cylindres coaxiaux. *Biorheology* **11**, 323–330, 1974.

On p. 324, lines 22 and 23, instead of “soit à partir d'une huile . . . tel que”, please read “soit de façon théorique en mesurant le couple T en appliquant différents poids au cylindre interne mobile R , tel que” etc.