dase. These facts indicate the virtual absence of acetylmuramic acid residues, unsubstituted by peptide, in these walls. The situation is thus quite different from the hydrolysis of walls of *M. lysodeikticus* by egg white lysozyme, which treatment alone resulted in liberation of a small percentage of di- and tetrasaccharide (Ghuysen and Salton, 1960; Ghuysen, 1960). The cell wall of *S. aureus* may therefore be a far more rigid structure than that of *M. lysodeikticus*. This fact could provide a further explanation for its resistance to egg white lysozyme.

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Failure of 10 Congeners of *myo*-Inositol to Support or to Inhibit the Growth of a Cultured Human Cell

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Received April 25, 1963

Ten congeners of *myo*-inositol failed to support the growth of a human cancer cell (KB) even at 10^{-4} g/ml, 1000 times the minimal effective concentration of *myo*-inositol itself. Eight compounds tested at 10^{-3} g/ml failed to inhibit the growth-promoting activity of *myo*-inositol at 2×10^{-6} g/ml, a ratio of analog to *myo*-inositol of 500:1.

Interest in the supporting or inhibiting effect of inositol congeners on human cell growth arises from the fact that ordinary (*myo*) inositol is one of the twenty-two organic compounds (including thirteen amino acids) which are necessary and sufficient for growth of cultured human cells. In the absence of *myo*-inositol, those defined components, supplemented with dialyzed serum, permit growth only on the addition of serum ultrafiltrate. Experiments in which ninety growth factors were examined showed that *myo*-inositol was able wholly to replace the ultrafiltrate, while none of the other eighty-nine factors, either separately or together, showed demonstrable activity (Eagle *et al.*, 1956).

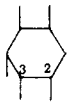
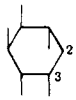
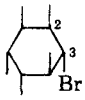
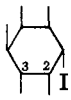
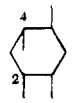
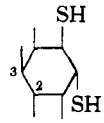
Most cultured mammalian cells can synthesize only a fraction of their *myo*-inositol requirement from glucose (Eagle *et al.*, 1960). One cell line, a mouse fibroblast, not only produced enough for its own survival and growth but released sufficient inositol into the medium to permit the parabiotic growth of another and inositol-dependent line. Another cell, a variant of the Hela strain, synthesized marginal amounts, so that exogenous inositol became essential for survival only at inocula of less than 200,000–500,000/ml (Eagle and Piez, 1962). With most cultured mammalian cells, however, exogenous inositol was essential for survival and growth (Eagle *et al.*, 1956), presumably because of the loss of the newly synthesized material to the medium in amounts which exceeded the biosynthetic capacity of the cell (Eagle and Piez, 1962).

A number of recently synthesized inositol analogs and derivatives (McCasland *et al.*, 1954,1961, 1963a,b,c; Shoolery *et al.*, 1961) have now been tested both for their ability to support the growth of an inositol-requiring culture (human carcinoma strain KB) (Eagle, 1955), and for their possible antagonism to *myo*-inositol itself. The compounds are listed in Table I. None of these substituted for inositol in any concentration up to 10^{-4} g/ml, 100 times the maximally effective concentration of *myo*-inositol (Eagle *et al.*, 1956), and 1000 times the concentration (10^{-7} g/ml) with a partial growth-promoting action. Further, when eight of these compounds were used at 10^{-3} g/ml in conjunction

* Albert Einstein College of Medicine. Supported by a grant (E-4153) from the National Institute of Allergy and Infectious Diseases, National Institutes of Health, U. S. Public Health Service, and by a grant (G-17192) from the National Science Foundation.

with 2×10^{-6} g/ml of *myo*-inositol, a 500:1 ratio of analog to inositol, none showed a growth-inhibiting effect (cf. last column in Table I).

TABLE I
FAILURE OF TEN CONGENERS OF *myo*-INOSITOL[a] TO SUPPORT OR TO INHIBIT THE GROWTH OF A CULTURED HUMAN CELL

Compound Tested	Growth[b] in 5 Days when Added at 10^{-4} g/ml to Otherwise Inositol-free Medium	Antagonistic Action of 10^{-3} g/ml to *myo*-Inositol at 2×10^{-6} g/ml (amount of cellular growth[b] after 5 days)
DL-1-Deoxy-*epi*-inositol 	1.3[c]	13.6 ×
(+)-1-Deoxy-*allo*-inositol 	0.95	13.8 ×
(−)-2-Deoxy-*allo*-inositol 	1.16	—
(−)-3-Bromo-3-deoxy-L-inositol 	1.0	14.4 ×
(−)-3-Chloro-3-deoxy-L-inositol 	0.89	14.6 ×
(−)-1-Chloro-1-deoxy-*neo*-inositol 	0.89	13.5 ×
(−)-1-Iodo-1-deoxy-*neo*-inositol 	1.27[c]	13.8 ×
DL(124/5) Stereoisomer of 1,2,4,5-cyclohexanetetrol 	1.14	14.2 ×
meso(13/25) Stereoisomer of 1,2,3,5-cyclohexanetetrol 	0.94	9.84[d] ×
D(126/345) Stereoisomer of 5,6-dimercapto-1,2,3,4-cyclohexanetetrol 	1.0	—
Control with *myo*-inositol alone	10^{-4} g/ml 12.9 10^{-5} g/ml 12.0 10^{-6} g/ml 11.2	14.0 ×

[a] The methods of cell cultivation, the medium used, and the measurement of cell growth by protein determination have been described in previous communications of Eagle *et al.* (1956, 1960, 1962). A human cancer cell (KB) culture was used throughout (Eagle, 1955). [b] Referred to inoculum as 1. [c] Insignificant amount of growth, often observed in inositol-free medium. [d] Questionable significance: growth with 10^{-5} g/ml of analog was 14.3 ×.

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