

# Massachusetts General Hospital

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GENERAL DIRECTOR

IN WAVERLEY  
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W. FRANKLIN WOOD, M.D.  
DIRECTOR

IN LINCOLN  
STORROW HOUSE  
(CONVALESCENTS)

October 2, 1956

Dear Dr. Lederberg:

One of the cultures which I sent you, the Proteus 52 regained from the L form, needs some comment. It has a high resistance to penicillin and the culture is pleomorphic on penicillin plates, but most of the colonies are not of the L-type. In the same way, it is difficult to decide the nature of the growth in broth. Such strains may be interesting in some respects but are not appropriate to study the properties of the L forms and it was a mistake to send it to you. Usually the resistance to penicillin of a Proteus recovered from the L form is not increased.

I would like to add a few remarks to the possible connection of protoplasts, large bodies and L forms. My impression is that if we regard the protoplasts as the living organisms inside of a fairly rigid cell wall, the L forms are probably the growth of this organism without building up the cell wall. However, the large body is not the protoplast of a single bacterium but it is produced by a limited multiplication of a single protoplast. This was most clearly visible with the Bacteroides strain 132 to which I will refer in an other connection also. The large bodies developed in the broth cultures of this strain without the addition of penicillin or any other growth-inhibiting substances. The sequence was thus and almost all bacteria went through the same sequence at the same time:-

Division stopped after 6 - 8 hours.

When transfers were made to an agar plate during the development of large bodies, within a few hours all these various forms were retransformed to the usual bacilli. The most interesting was the retransformation of :-

They fall without changing the outline of the structure into bacilli indicating that the bacilli were preformed in them:-

I published photographs of this process. It is apparent in this case that the development of the large bodies was not a physical process like inhibition with water, but a growth process involving division of the living units. The staining of the chromatinic structures both in strain 132 and in other bacteria indicated the same thing.



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As far as I can see, there is nothing in the origin and multiplication of L forms which contradicts the supposition that they correspond to protoplasts. They may be protoplasts slightly modified or in a special condition. They are poorly adapted to our media and most cells die and disintegrate.

Would you mind if I made a few experiments with the two colon bacillus strains in which mating is often observed? If not, could you send me these two strains?

With kind regards,

Sincerely yours,

*Louis Dienes*

Louis Dienes, M.D.

I received your letter of September 27 after this letter was typed. I would like very much to read the promised enclosure but it was not in the letter. It is wonderful that you succeeded to get L forms from K-12. I had some time ago the idea that the L cultures may be analogous to the haploid yeast colonies of Winge. It will be very interesting to see whether they have any genetic function.

It may be of some use if I also make a few experiments with your colon bacillus strains. I would be very much interested to know ~~whether~~ what kind of L cultures you get. I leave it entirely up to you whether it fits into your plans or not.

I am quite excited to learn how your experiments are developing.