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March 8, 1957

Professor Arthur Kornberg
Department of Microbiology
Washington University
St. Louis, Missouri

Dear Arthur:

I am enclosing two preprints which I am sure you will find of interest.

You may recall, last June at the Baltimore meeting, I mentioned to you the possibility of DNA's acting by forming a three stranded molecule. In the enclosed, you will see that we have observed a reaction between the poly A + poly U molecule ( which has a diffraction pattern very similar to that observed in DNA) and polyuridylic acid. Apparently, these two combine in the presence of magnesium ions to form a three stranded molecule. Furthermore, the reaction appears to be specific in that the other polynucleotides do not react with the (A + U) molecule.

This we find of great interest because it suggests the possibility that DNA may act to synthesize RNA by forming single polynucleotide strands in one of the grooves in DNA. If you look at the DNA molecule quite closely, you will see that there are four different kinds of sites on the molecule. These sites arise from the fact that there are two base pairs each of which may be present in two different orientations. It is possible that these four sites are specific for the interactions of four incoming ribonucleotides and that they may act to synthesize a specific RNA with a specific sequence of bases.

I hope your DNA synthesis is going along very well. Have you passed the region of a 50% increase in DNA over that used as primer? And, have you been able to make enough material to consider the possibility of carrying out X-ray diffraction studies?

I am sure you have read Taylor's work on chromosome duplication (Jan. 57, PNAS). It is quite striking and very surprising.

With best regards.

Yours sincerely,

Alexander Rich