Brilliant Ideas Can Come in All Sizes: Research Letters

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Abstract

The Journal of Medical Internet Research is pleased to offer “Research Letter” as a new article type. Research Letters are similar to original and short paper types in that they report the original results of studies in a peer-reviewed, structured scientific communication. The Research Letter article type is optimal for presenting new, early, or sometimes preliminary research findings, including interesting observations from ongoing research with significant implications that justify concise and rapid communication.

The Journal of Medical Internet Research is publishing Research Letters for several reasons. First, the Research Letter is an optimal medium for quickly communicating transformative work, offering authors an opportunity to submit their focused research work for potentially more rapid peer review and publication processes simply by the nature of the communication. Second, larger and more extensive research on contemporary issues might also produce focused findings that may be incidental to the primary aims, yet still be valuable to report. One interesting key result can be displayed in 1 or 2 tables or figures. Additionally, students and early career researchers are encouraged to submit Research Letters as a pathway for reporting their impactful, targeted research projects, which may offer a stepping stone for these researchers as they publish work that contributes to the field and to their scientific growth and professional advancement. For readers, who often include busy scientists and professionals, Research Letters can offer new ideas or approaches in a brief and quickly digestible, yet robust and high-quality, manner. Taking experiences from other high-impact journals, Research Letters are often highly cited.
Research Letters should still present original work that has not been previously published. Work presented at a conference that has not been previously published in proceedings can be submitted as a Research Letter. However, tables or figures from previously published or submitted papers would not be considered in a Research Letter. Authors can refer to article type information on the format of a Research Letter in JMIR Publication’s Knowledge Base [4]. In this issue of the Journal of Medical Internet Research, the journal has published its first example [5], with additional Research Letters currently in review.

We encourage authors to consider submitting their Research Letters to the Journal of Medical Internet Research. Additionally, the journal editors may suggest to authors the Research Letter article type as a more suitable format for their work. This is not intended to undersell the contribution of the original work.

Figure 1. Archived scan of "Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid," published on April 25, 1953, by Watson and Crick [2]. Source: Linus Pauling and the Race for DNA [3].

is a residue on each chain every 3-4 A. in the z-direction.
We have assumed an angle of 36° between adjacent
residues in the same chain, and the figure shows
that the structure repeats after 10 residues on each chain, that is, after 34 A. The distance of a phosphate group from the fibre axis is 10 A. As the phosphate groups on the outside, actions have easy access to them.

The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purines and pyrimidines bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so that the two lie side by side with identical -o-orientations. One of the pairs must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).

In other words, if an adenine forms one member of a pair, on either chain, then on those atoms which interact other member must react similarly for the guanine and cytosine. The sequence of bases on a single chain does not appear to be restricted in any way. However, if only specific pairs of bases can be formed, it follows that if the sequence of bases on one chain is given, then the sequence on the other chain is automatically determined.

It has been found experimentally* that the ratio of the amounts of adenine to thymine, and the ratio of guanine to cytosine, are always very close to unity for deoxyribose nucleic acid.

It is probably impossible to build this structure with a ribose sugar in place of the deoxyribose, because the extra oxygen atom would make too dense a van der Waals contact.

The previously published X-ray data** of deoxyribose nucleic acid are insufficient for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unsound until it has been checked against more exact results. Some of these are given in the following communications. We were not aware of the details of the refined process theory when we first devised our structure, which rests mainly though not entirely on published experimental data and biochemical arguments.

It has not escaped our notice that the specific pairing we postulated immediately suggested a possible copying mechanism for the genetic material. Full details of the structure, including the conditions assumed in building the model together with a set of co-ordinates for the atoms, will be published elsewhere.

We are much indebted to Dr. Jerry Donohue for constant advice and criticism, and on interatomic distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at...
submission. Authors may not realize that the Research Letter is subject to the same rigorous peer-review process as other article types here at JMIR Publications. As we have seen from Einstein and other eminent Nobel Prize winners, brilliant ideas can be expressed succinctly.

We look forward to reviewing and publishing your Research Letters!

Conflicts of Interest

RK is the Co-Editor-in-Chief at JMIR Publications. TIL is a scientific editor at JMIR Publications. GE is founder and president of JMIR Publications.

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