1. What is the significance of this short communication?

This paper is short still revolutionary, it describes the mechanism – or algorithm - for building every cell in every form of life is encoded in four-letter sequences of DNA: ACTG.

1. Watson, Crick and Wilkins were awarded the 1962 Nobel Prize in Physiology or Medicine "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material". Do you believe that they should have won the Nobel Prize for this work?

DNA was first discovered by Oswald Avery and his colleagues at Rockefeller University who extracted DNA from a strain of bacteria, and showed that DNA transmitted hereditary transformations. Next step was to determine its atomic structure and shape to explain how it works. Around the same time of Watson and Crick paper, many researchers were using X-ray crystallography, a technique which uses diffraction of X-ray on a crystal to determine its atomic structure, on DNA. In addition of Watson, and Crick, Wilkins and Rosalind Franklin were also deeply involved in this research. Story relates a tumultuous debate between Franklin who commented on the helix-structure proposed by Watson and Crick, and advancing that the twisting backbone has to be on the outside. A franklin student’s picture of DNA, known as Photo 51, reinforced Watson, and Crick conviction about DNA helicoidal structure. Finally, they had a good understanding of DNA’s structure: the twisted and spiraled; double-stranded helix with two sugar-phosphate strands and protruding from these the four bases: adenine, guanine, and cytosine. It was a race to discover the double helix and the credit goes to the fastest to publish the paper detailing the discovery. In this instance, Watson and Crick made the last critical and brilliant contribution and completely deserved the Nobel Prize.

1. Who is Maurice Wilkins? What is Photo 51?

Wilkin was biochemist at King’s College London using X-ray diffraction to study DNA. Photo 51 is an X-ray diffraction image of a gel composed of DNA fiber taken by Raymond Gosling, a student of Franklin who was working also on DNA at King’s College London. It shows a black cross of reflections which, Watson saw, could only arise from a helical structure.

1. Why was Rosalind Franklin not awarded the Nobel Prize for her contribution to the discovery of the structure of DNA?

The Nobel prize is limited to three people and by the time in 1962, it was awarded, Franklin had died. If she had survived, the Nobel committee would have faced a difficult situation.

1. You can have up to three people on a Nobel Prize award, name three people that you think should have received the Nobel Prize for discoveries related to the molecular structure of nucleic acids and its significance for information transfer in living material