An advance on new generations of chemotherapy and antiviral drugs

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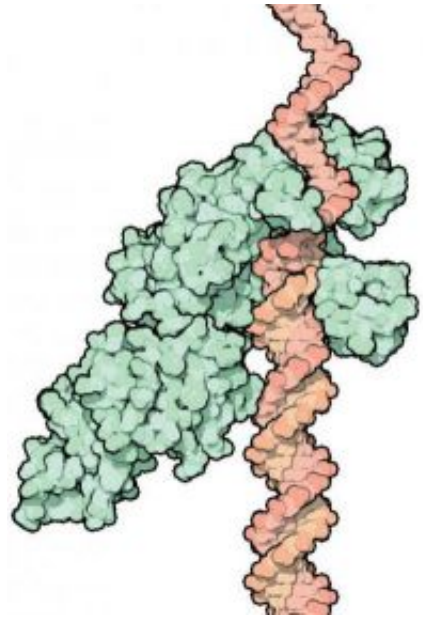

Above is an illustration of DNA polymerase moving along the length of a DNA strand. Researchers are targeting new chemotherapy drugs that efficiently block uncontrolled DNA replication while minimizing side effects. Credit: The Protein Data Bank

Researchers are describing progress toward developing a new generation of chemotherapy agents that target and block uncontrolled DNA replication — a hallmark of cancer, viral infections, and other diseases — more effectively than current drugs in ways that may produce fewer side effects. Their article is scheduled for the Aug. 27 issue of ACS'

Biochemistry.

In the article, Anthony J. Berdis updates and reviews worldwide research efforts to develop drugs that target DNA polymerases, the enzymes responsible for assembling DNA from its component parts.

Several promising strategies are already in use that inhibit uncontrolled DNA replication, particularly in anticancer therapy, but most produce severe side effects and are hampered by drug resistance, the researcher notes.

Berdis says that one of the more promising strategies to date involves the use of so-called nucleoside analogues, artificial pieces of DNA that inhibit replication by substituting for natural segments. Most nucleoside analogues directly target the active site of the polymerase enzyme, a non-specific approach that can also harm healthy cells which contain the enzyme.

Berdis describes an alternative approach in which the drugs directly target damaged DNA while avoiding healthy DNA, side-stepping the polymerase enzymes of normal cells. The development, which shows promise in preliminary lab studies, could lead to improved nucleoside analogues with fewer side effects, he says.

Article: "DNA Polymerases as Therapeutic Targets"; dx.doi.org/10.1021/bi801179f

Source: American Chemical Society

https://phys.org/news/2008-09-advance-chemotherapy-antiviral-drugs.html