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Part 1

How can reverse transcriptase inhibitors slow the replication of DNA? Give an example that laypersons without this knowledge could understand, and why they need to know it.

According to Namasivayam et al. (2018), reverse-transcriptase inhibitors (RTIs) are a class of antiretroviral medications used in the management of HIV disease. The RTIs are at times used in the treatment of hepatitis B. The RTIs prevent the standard progress of a reaction. Within the human body, the reactions are catalyzed by enzymes and the inhibitors are in the frontline to interfere with the normal functioning of the reactions. The reverse transcriptase (RT), likewise recognised as RNA-dependent DNA polymerase, is a DNA polymerase enzyme that transcribes single-stranded RNA into DNA. The enzyme promotes the synthesis of a double helix DNA. This action happens when the RNA has been transcribed in the initial step to form single-stand DNA. The activity of the RTIs against HIV is due to the transcriptase that transforms RNA into DNA for insertion in the host DNA sequence. The reverse transcriptase is determined for catalyzing the development of DNA from an RNA template. Their reverse transcriptase has been approved by the FDA for usage in managing the rate of replication, especially for HIV patients (Rice et al., 2018). There has been a significant improvement in the health of HIV patients and their lives have been elongated by the use of RTIs. The commonly used protease inhibitors include; atazanavir, darunavir, and fosamprenavir.

The most interesting fact regarding the RTIs and their applicability in DNA replication can be in the example below. HIV is a virus closely associated with RNA and the genetic material in the formation of RNA a less stable molecule than DNA. The RTIs are essential in interfering with the functioning of HIV. The replication rate of the virus is lowered progressively and this is followed by the reduction in the clinical manifestations. The implication of this is that

Nucleotide Reverse Transcriptase Inhibitors (NRTIs) constrain converse transcription by instigating chain end after they have been united into viral DNA (Rice et al., 2018).

References

Namasivayam, V., Vanangamudi, M., Kramer, V. G., Kurup, S., Zhan, P., Liu, X., ... &

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Rice, G. I., Meyer, C., Bouazza, N., Hully, M., Boddaert, N., Semeraro, M., ... & Llibre, A.

(2018). Reverse-transcriptase inhibitors in the Aicardi–Goutières syndrome. *New England Journal of Medicine*, 379(23), 2275-2277.

Part 2

What concept from chemistry was the most challenging and why? What can you do to learn more about this concept as you progress through your degree program and career?

Chemistry seems a complicated subject for many learners. Despite that many learners have little interest in chemistry, our daily lives are run by the collaboration of chemical processes as well as biological processes (Jones 2019). Take an incidence on the photosynthesis that supports the food chains. There are combinations of chemicals and this proves the significance of chemistry. I think all the living organisms and bits of chemistry and a combination of chemicals that aid in their survival. In the nursing sector, chemistry is broadly applied in the manufactory of medication. Some diagnostic procedures use complex chemicals that need intense knowledge in

chemistry. As a nurse, I think the knowledge in chemistry is much helpful and offers people with great expertise to be efficient in the provision of medical services.

The course has been much information and helped me to gather the necessary knowledge on chemistry for competency in nursing. The most challenging part of this course to me has been balancing the chemical equations. A balanced chemical equation should have well-written chemical symbols, the state symbols should be well written and the coefficients should be present. The coefficients should be in such a way that all the elements in the equations on both sides are equal. This is somewhat tiresome and needs a lot of practice. Some equations are complicated and this makes it even harder to balance the equations. Through practice, I managed to gather knowledge on balancing the equations although it was challenging.

Reference

Jones, T. H. (2019). Providing relevance in chemistry for nursing students. *Journal of chemical education*, 53(9), 581.

Part 3

How will the knowledge of chemistry play into your career role? What aspect of chemistry do you feel will be the most important moving forward? one paragraph (four to five sentences) response

Chemistry is significant in nursing in that it helps the nurses in giving medications to patients. The knowledge I have gathered will impact a lot in my nursing career in that I am capable of comprehending how particular medicine reacts with different patients. This is an

essential concept to avoid the wrong combination of drugs that can result in adverse effects. As well, I would like to advance in my studies and I am sure that I will need much knowledge on chemistry for my RN education programs. The aspect of chemistry that I might use much in my nursing career is moles. There is a need to know how many moles of a substance is needed to make drugs. Even in the diagnostic process, chemicals are used and the knowledge of moles will be needed.

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