Drug Discovery Assignment

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Problem 1

There are more than 10,000 drugs known in the market for various diseases. India is probably the largest consumer of these drugs. How many drugs are discovered in India? Do an internet search.

Solution: The first drug to be discovered in India was *Urea Stibamine* discovered by U N Brahmachari in the year 1922. Then few drugs have been discovered, some compounds have been licensed and some new chemical entities(NCEs) have been made. After combining a lot of information from the following sources:
Resource 1
Resource 2
Resource 3
Resource 4
Resource 5
Resource 6
Resource 7
I consolidated all of the lists to find that, there are approximately 35-40 drugs developed in India. Indian Drug Companies have also lisenced the use of 35 compounds for other drug developers to use and 23 New Chemical Entities are under study by the Indian Companies.

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Problem 5

Many antiviral drugs are nucleobase-mimics. How many of the antiviral drugs you have listed are mimics of nucleobases?

Solution: Of the drugs I wrote, 30 are nucleobase mimics. □

Problem 6

Group the nucleobase-mimics under the parent nucleobase

Solution:

1. Nucleosides
    (a) Guanosine Analogues
        i. ABACAVIR
        ii. ACYCLOVIR
        iii. FAMCICICLOVIR
        iv. PENCICLOVIR
        v. RIBAVIRIN
        vi. TARIBAVIRIN
        vii. VALACYCLOVIR
    (b) Adenosine Analogues
        i. GALDESVIR
        ii. REMDESVIR
    (c) Thymidine Analogues
        i. EDOXUDINE
        ii. ZIDOVUDINE
        iii. STAVUDINE
        iv. TELBIVUDINE
    (d) Deoxy-Adenosine Analogues
        i. VIDARABINE
        ii. DIDANOSINE
    (e) Deoxy-Guanosine Analogues
        i. ENTECVIR
        ii. GANCICLOVIR
    (f) Deoxy-Cytidine Analogues

i. EMTRICITADINE
ii. IBACITABINE
iii. LAMIVUDINE
iv. ZALCITABINE
v. CYTARABINE
vi. GEMCITABINE

(g) Deoxy-Uridine Analogues
i. IDOXURIDINE
ii. TRIFLURIDINE

2. Nucleotides
(a) Adenosine Analogues
i. TENOFIVIR-ALAFENAMIDE
ii. TENOFOVIR-DISOPROXIL
iii. ADEFOVIR

(b) Deoxy-Cytidine Analogues
i. CIDOFOVIR

(c) Uridine Analogues
i. SOFOSBUVIR

□

Problem 7

What conclusion do you make from your analysis?

Solution: All antiviral drugs that researchers worked upon, the rational drug design strategy was they tried to attack the virus at every stage of the viral life cycle.
I inferred from the above grouping was that most of the antivirals developed and in use were those which targeted the processes that synthesize virus components after a virus invades a cell, that is they attack on reverse transcription
The conclusion was most of the antivirals developed were nucleotide or nucleoside analogues that mimic the building blocks of RNA or DNA,but deactivate the enzymes that synthesize the DNA or RNA,once the analogue is incorporated
in short these drugs prevent viral replication in infected cells by terminating DNA synthesis ,causing infected cells to die.
other antivirals which targeted viruses before cell entry VAP or anti-VAP antibodies were found to be expensive and their generation was partly trial and error.

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