

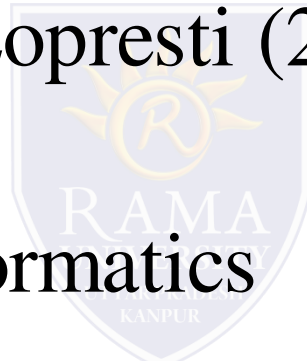


**FACULTY OF ENGINEERING AND
TECHNOLOGY**

Department of Biotechnology

Definition of Bioinformatics

- As defined by National Center for Biotechnology Information (2001).
- As defined by Lopresti (2008).
- Aims of Bioinformatics
 - To Store and arrange,
 - To analyze,
 - To interpret vast amount of large data



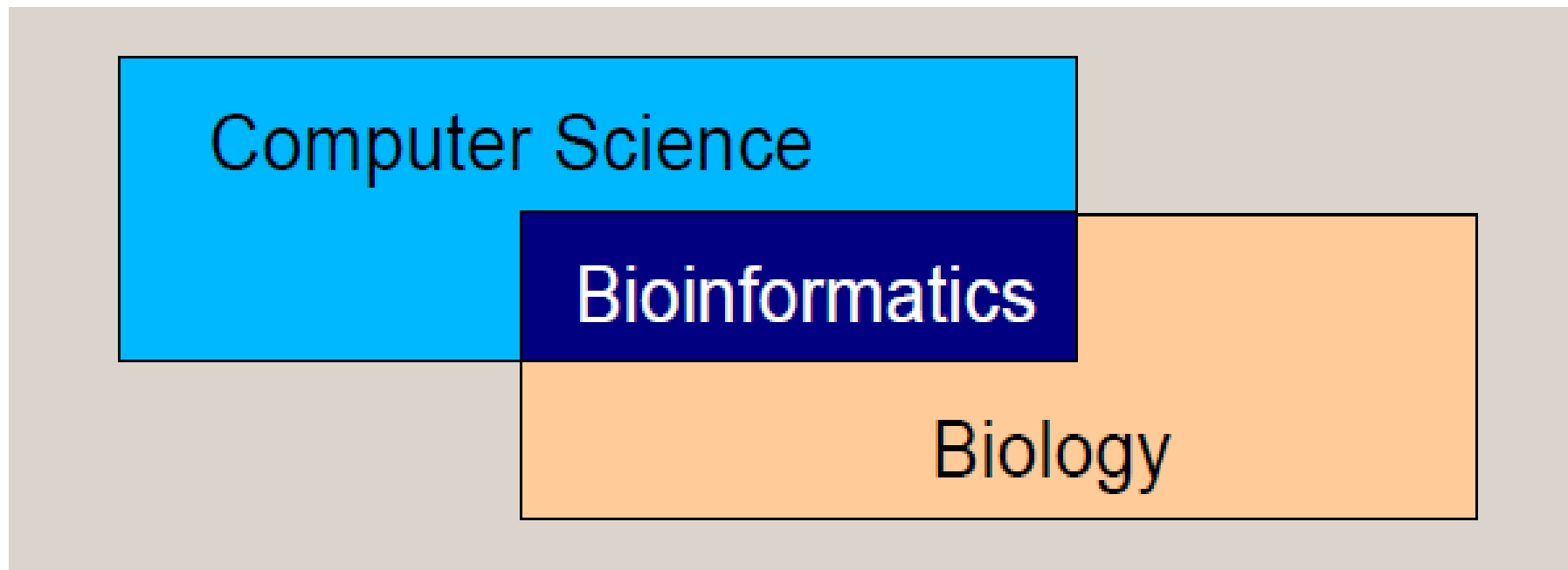


Figure 1: Illustrating the definition of bioinformatics (Lopresti, 2008).

What is Drug?

In pharmacology, Drug is any chemical agent that alters the biochemical or physiological processes of tissues or organisms

(United Nations Office Drug and Crime, 2015).



THE DRUG DISCOVERY PROCESS

Developing a new drug (figure 2) is
Lengthy (Ibekwe and Ameh, 2014),
Risky

It involves a number of processes, that are very expensive, figure 3, (Bie *et al*, 2015).

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Review and approval by Food & Drug Administration

1 compound approved

Phase III: Confirms effectiveness and monitors adverse reactions from long-term use in 1,000 to 5,000 patient volunteers.

Phase II: Assesses effectiveness and looks for side effects in 100 to 500 patient volunteers.

Phase I: Evaluates safety and dosage in 20 to 100 healthy human volunteers.

10 compounds enter clinical trials

5,000 compounds evaluated

Discovery and preclinical testing: Compounds are identified and evaluated in laboratory and animal studies for safety, biological activity, and formulation.

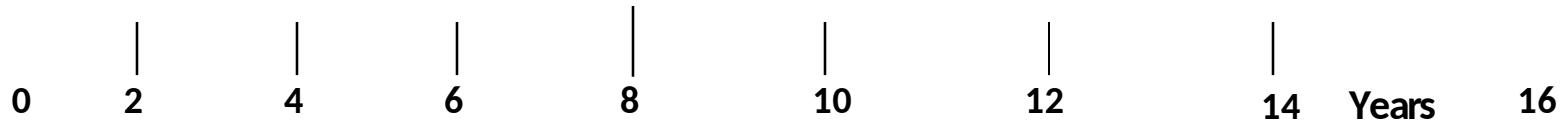


Figure 2 : how risky and lengthy traditional drug discovery is (Source: Tufts Center for the Study of Drug Development)



Figure 3 : How expensive the traditional drug discovery is (Jayaram *et al.*)

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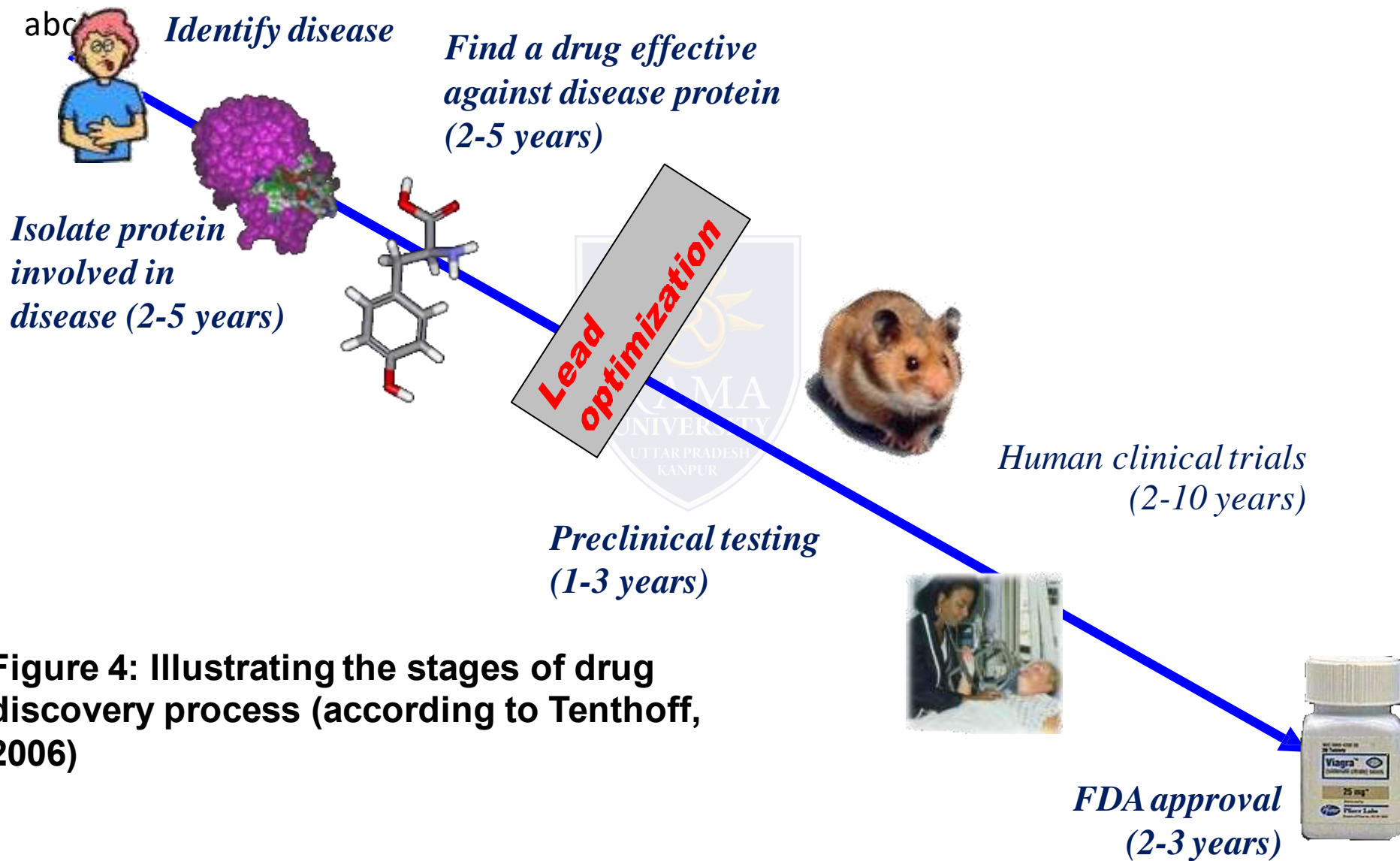


Figure 4: Illustrating the stages of drug discovery process (according to Tenthoff, 2006)

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**APPLICATION OF BIOINFORMATICS IN
THE DRUG DISCOVERY PROCESS**



ROLES OF BIOINFORMATICS IN THE DRUG DISCOVERY PROCESS

The application of bioinformatics cut across all the process of drug discovery, thereby

Reducing the risk of drug failure

Making it a bit cheaper

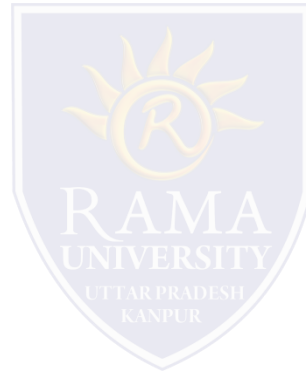
Reducing the time spent in the discovery

And also automates the entire process, thereby reducing human intervention.



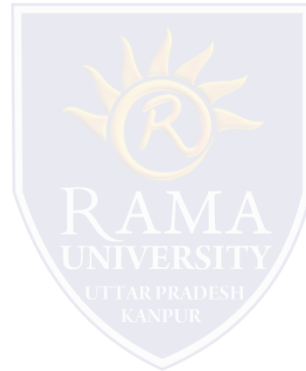
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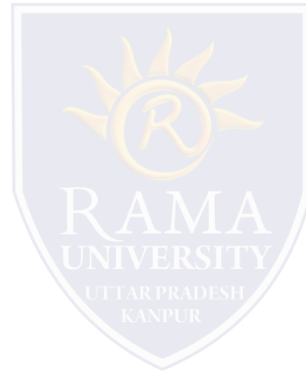
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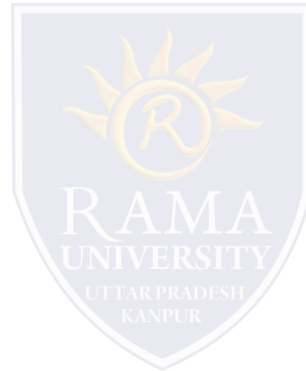
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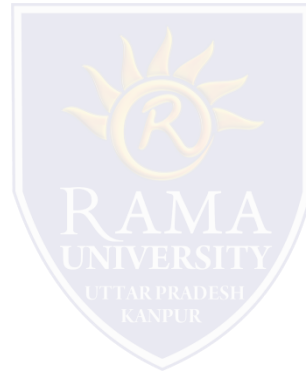
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