



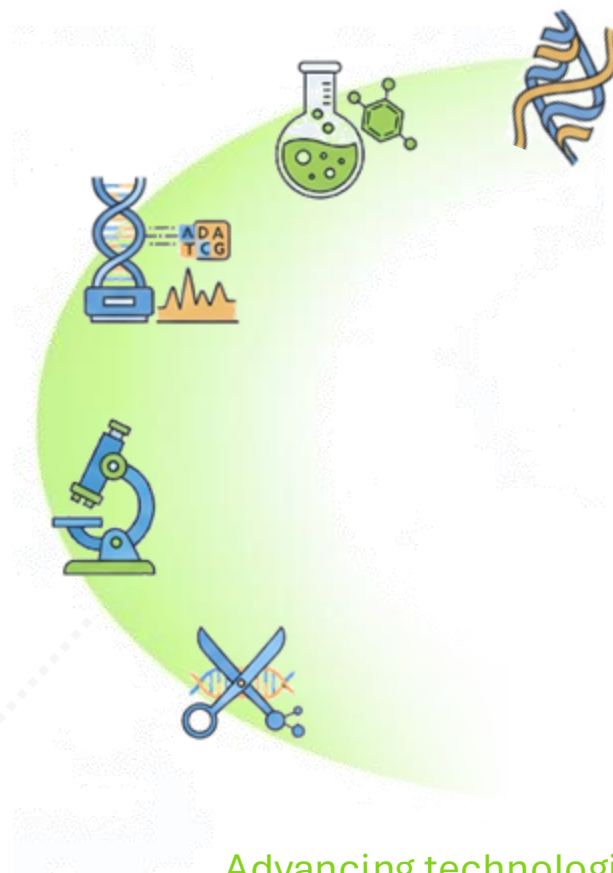
# Percorso «Tecnologie Bioinformatiche e Sistemiche»

UNIVERSITA' DEGLI STUDI  
DI MILANO  
**BICOCCA**

**BtBs**  
Dip. di Biotecnologie e Bioscienze

## Percorso Tecnologie Bioinformatiche e Sistemiche

### What's the logic?

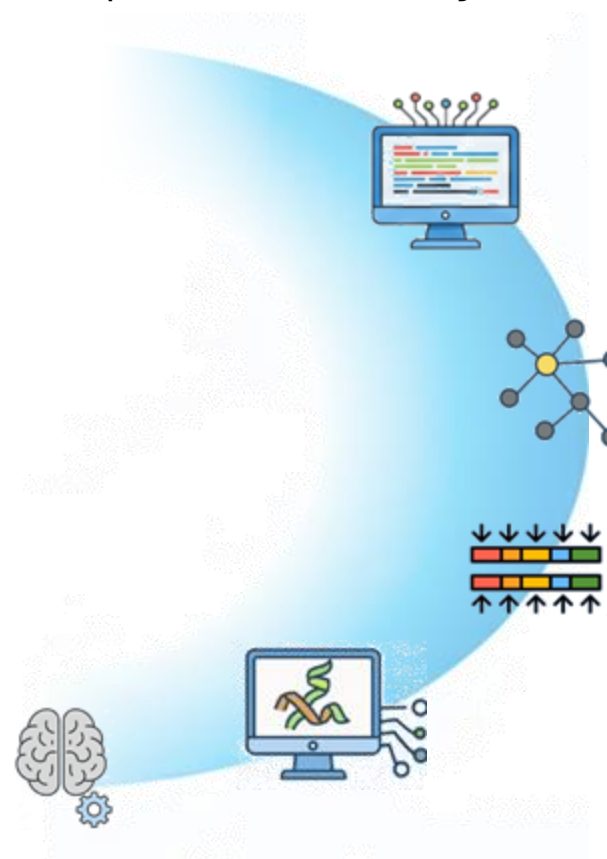


#### Advancing technologies

- ✓ increasingly **detailed** experimental insight into biological and chemical systems
- ✓ generation of ever-growing biological **data** sets

#### Advancing computational power and algorithms

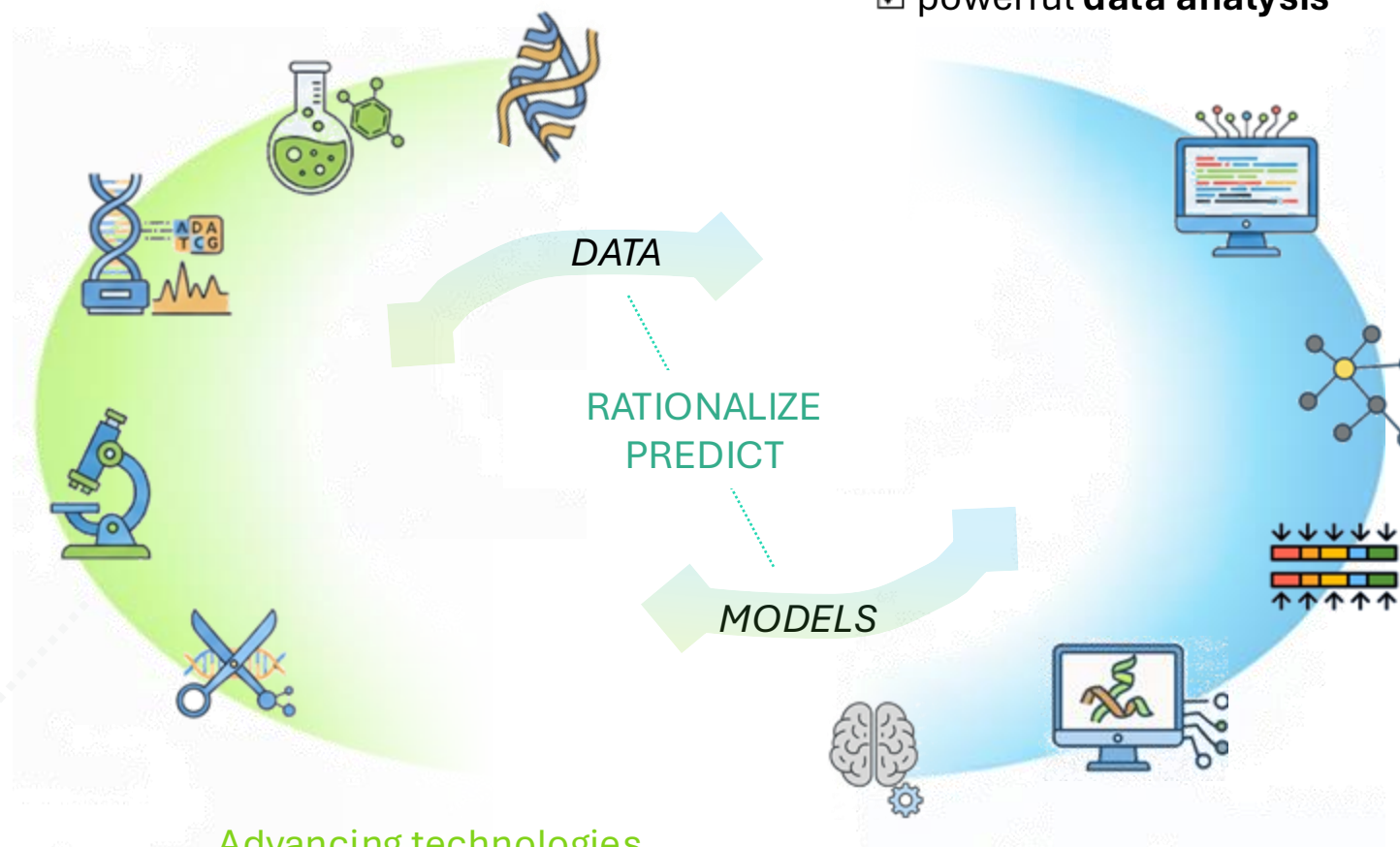
- ✓ accurate **modeling** of biological processes/systems
- ✓ powerful **data analysis**



### What's the logic?

#### Advancing computational power and algorithms

- ☑ accurate **modeling** of biological processes/systems
- ☑ powerful **data analysis**



#### Advancing technologies

- ☑ increasingly **detailed** experimental insight into biological and chemical systems
- ☑ generation of ever-growing biological **data** sets

# Percorso Tecnologie Bioinformatiche e Sistemiche

## Objectives

The program provides the foundations to navigate **advanced computational approaches** for the extraction of information from complex **biological data** and for the **simulation** of biological and biomolecular systems, promoting an **integrated, multi-scale** view of biological processes relevant to industrial biotechnology.

## Some key skills

**Modeling of metabolic, genetic and regulatory networks** to support the design and optimization of industrial bioprocesses and cell factories

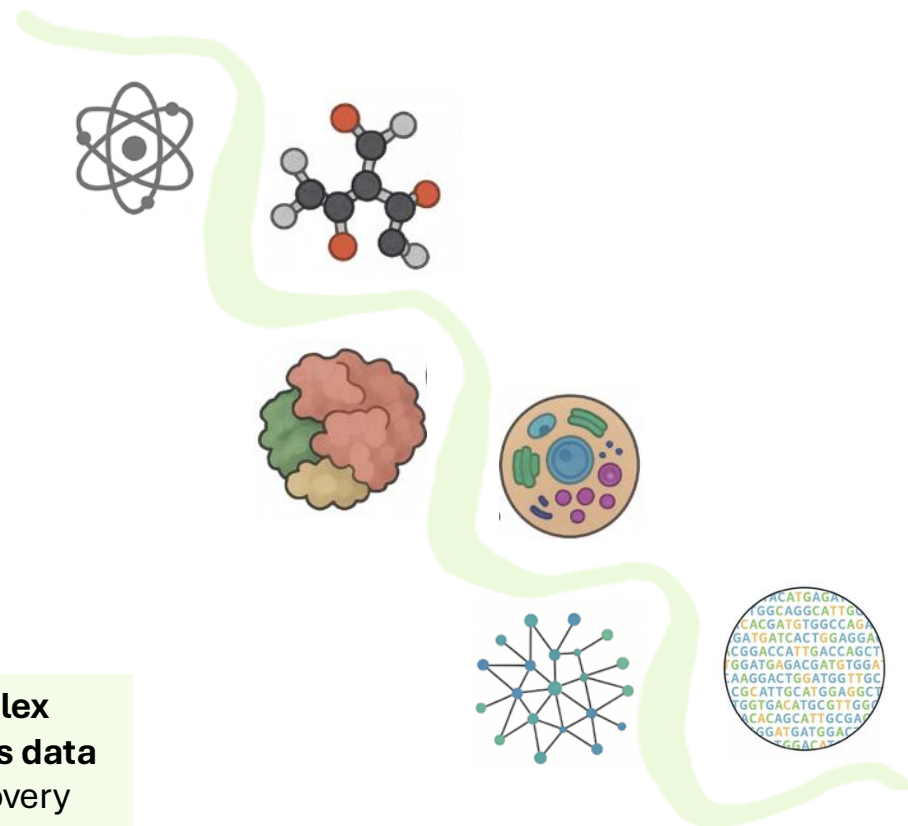
**Multi-scale modeling and simulation of biological systems and processes**, from biomolecular to cellular and network levels

**Structural biology and molecular modeling** including protein structure prediction and structure–function relationships.

**Analysis of complex biological and omics data** for biomarker discovery

**Computational enzyme optimization and drug design** for the development of protein variants and novel bioactive compounds.

**Application of artificial intelligence and machine learning in computational biotechnology**





# Percorso Tecnologie Bioinformatiche e Sistemiche

## Biotechnology and AI

### AI FOR SCIENCE

2025

nature portfolio

PARTNER CONTENT Partner retains sole responsibility for the content of this article

#### A data-driven look at AI's transformative impact on the future of science

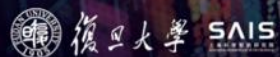
Fudan University and Shanghai Academy of AI for Science, in collaboration with Nature Research Intelligence, have released the *AI for Science 2025* report, offering insights into how AI can reshape scientific research.

Produced by

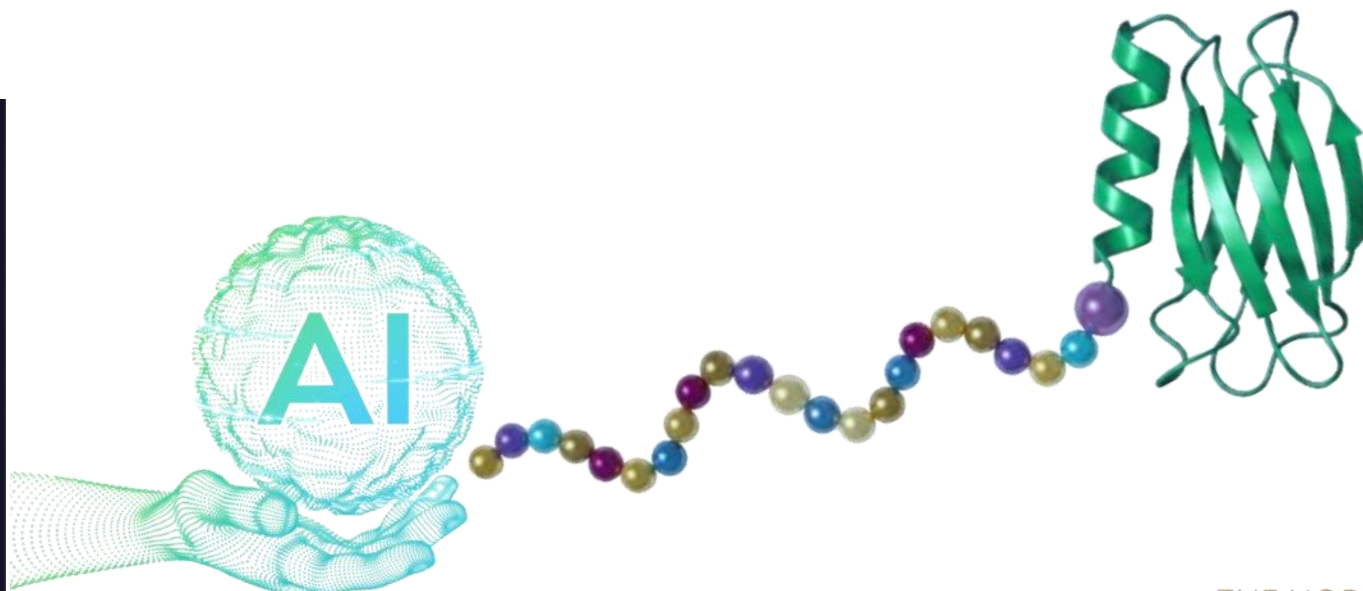
nature  
research intelligence



SAIS  
Shanghai Academy of AI for Science

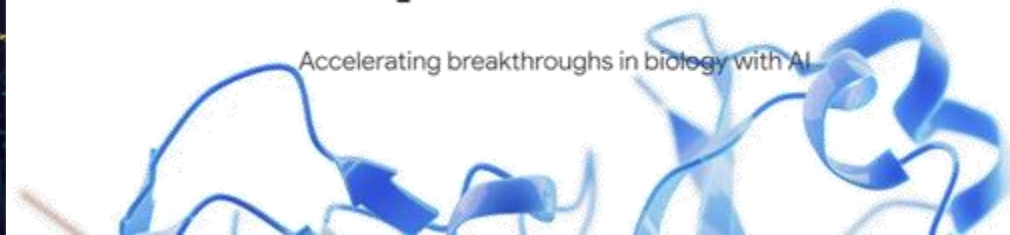


nature  
research intelligence



## AlphaFold

Accelerating breakthroughs in biology with AI



THE NOBEL PRIZE  
IN CHEMISTRY 2024



David  
Baker

"for computational  
protein design"

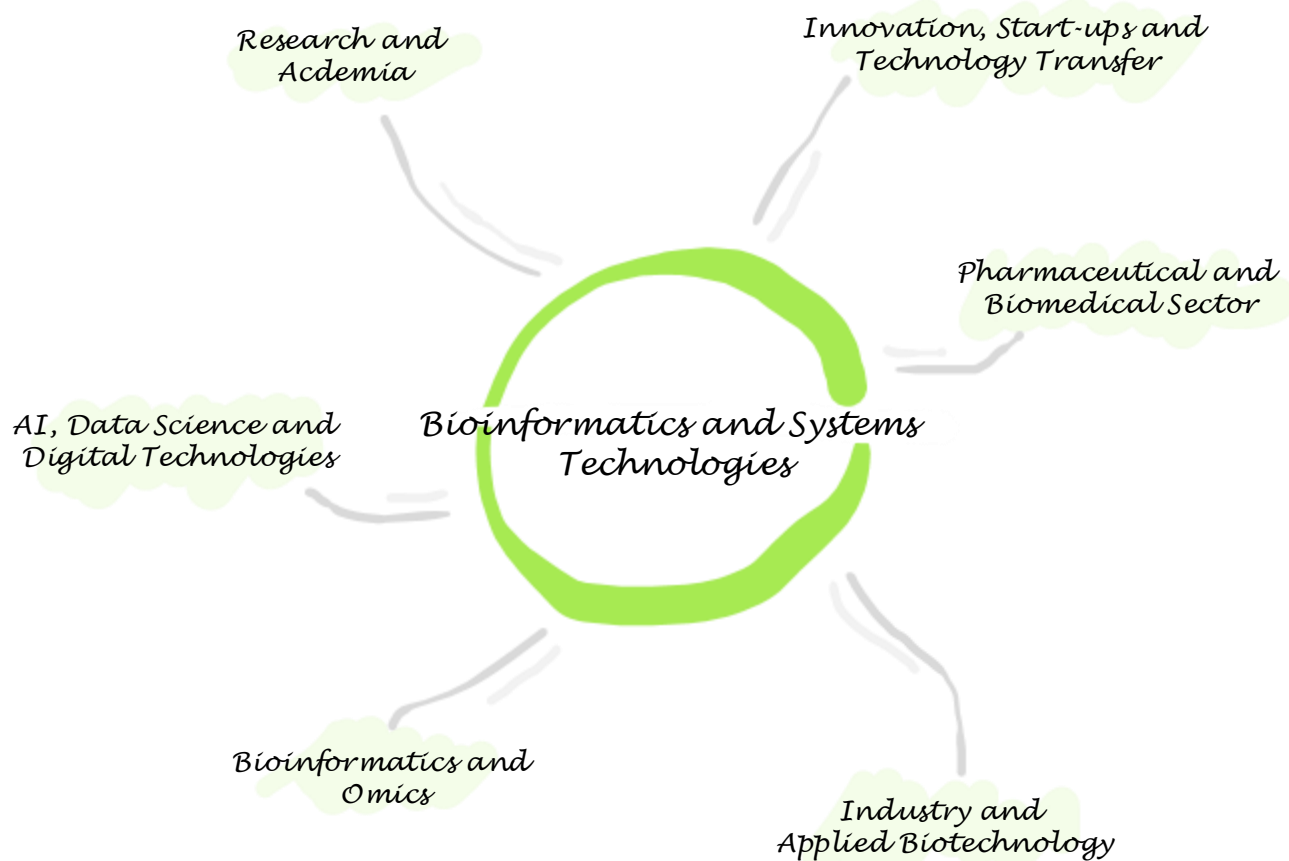
Demis  
Hassabis

"for protein structure prediction"

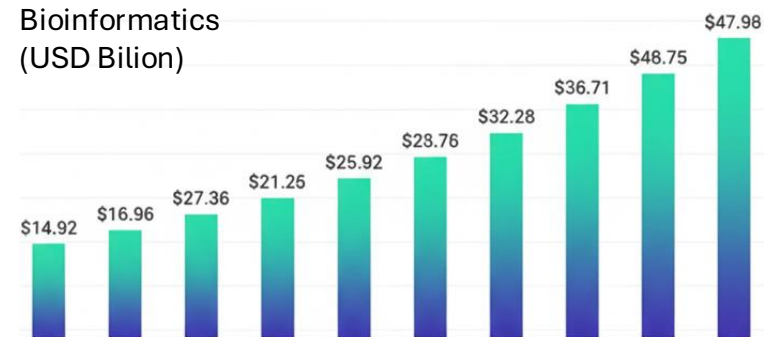
John M.  
Jumper

# Percorso Tecnologie Bioinformatiche e Sistemiche

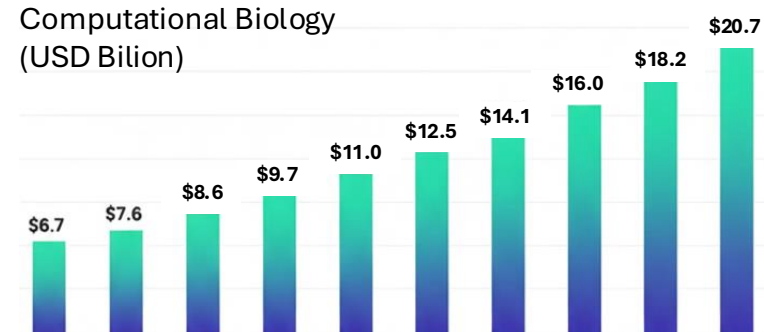
## Career opportunities



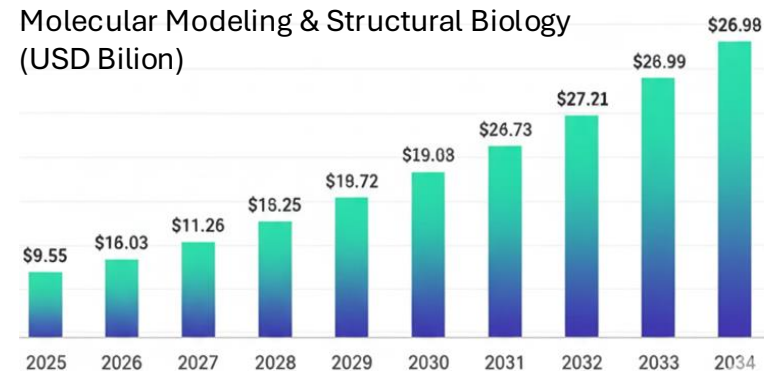
Bioinformatics  
(USD Billion)



Computational Biology  
(USD Billion)



Molecular Modeling & Structural Biology  
(USD Billion)



# Percorso Tecnologie Bioinformatiche e Sistemiche

## Structure and contents

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### Un insegnamento a scelta:

#### Tecnologie Bioinformatiche e sistemiche

#### **Discipline Chimiche** 6 CFU

- Strumenti computazionali per la bioinformatica (CHIM/03)

- Systems biochemistry (BIO/10)

#### **Discipline Biologiche** 6 CFU

#### **Discipline Per Le Competenze Professionali - Gruppo A** 6 CFU

- Proprietà intellettuale (IUS/04)
- Sociologia e comunicazione della scienza (SPS/07)

#### **Discipline Per Le Competenze Professionali - Gruppo B** 6 CFU

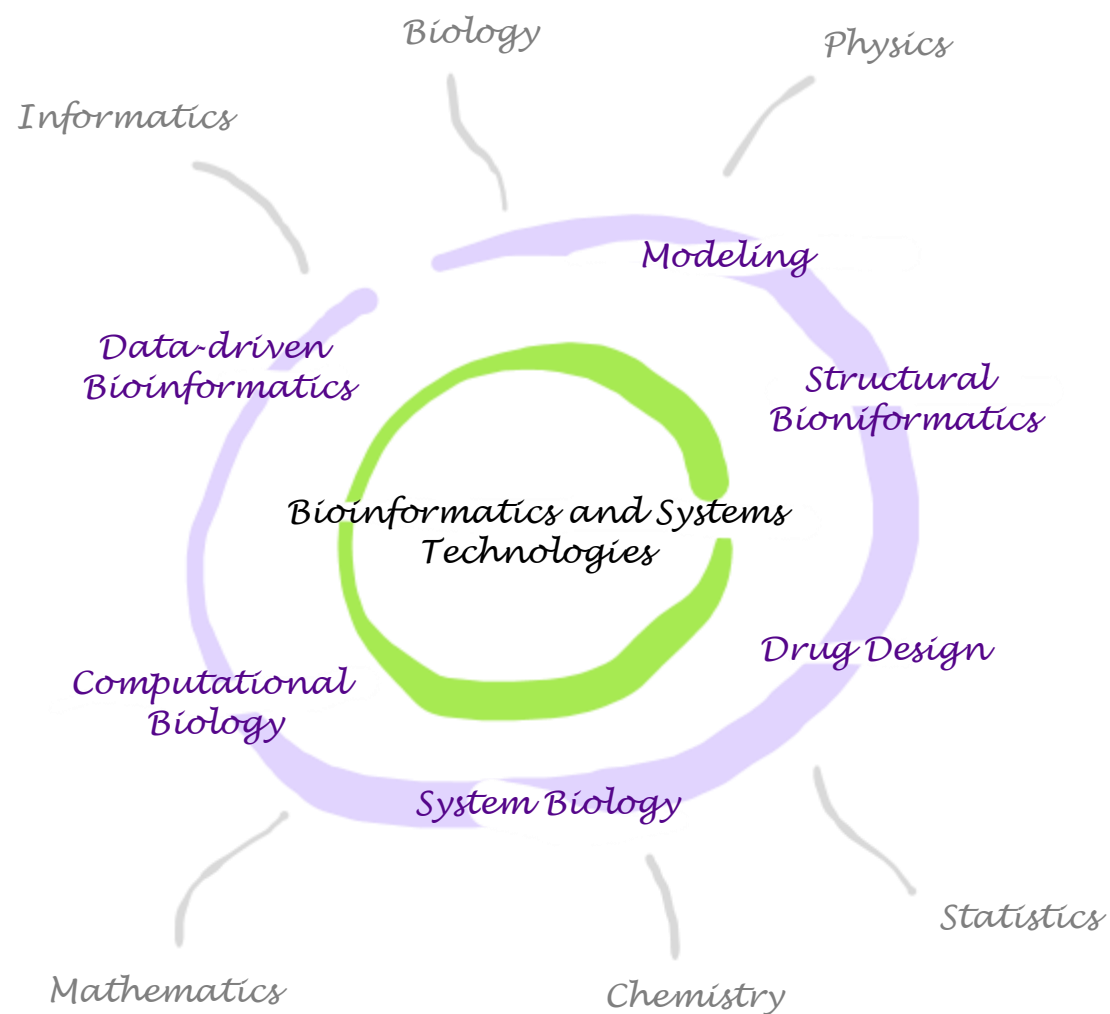
- Metodologie bioinformatiche (INF/01)
- Computational systems biology (INF/01)

#### **Discipline Affini Integrative**

- Analisi qualitativa e quantitativa di sistemi biologici (ING-INF/04)

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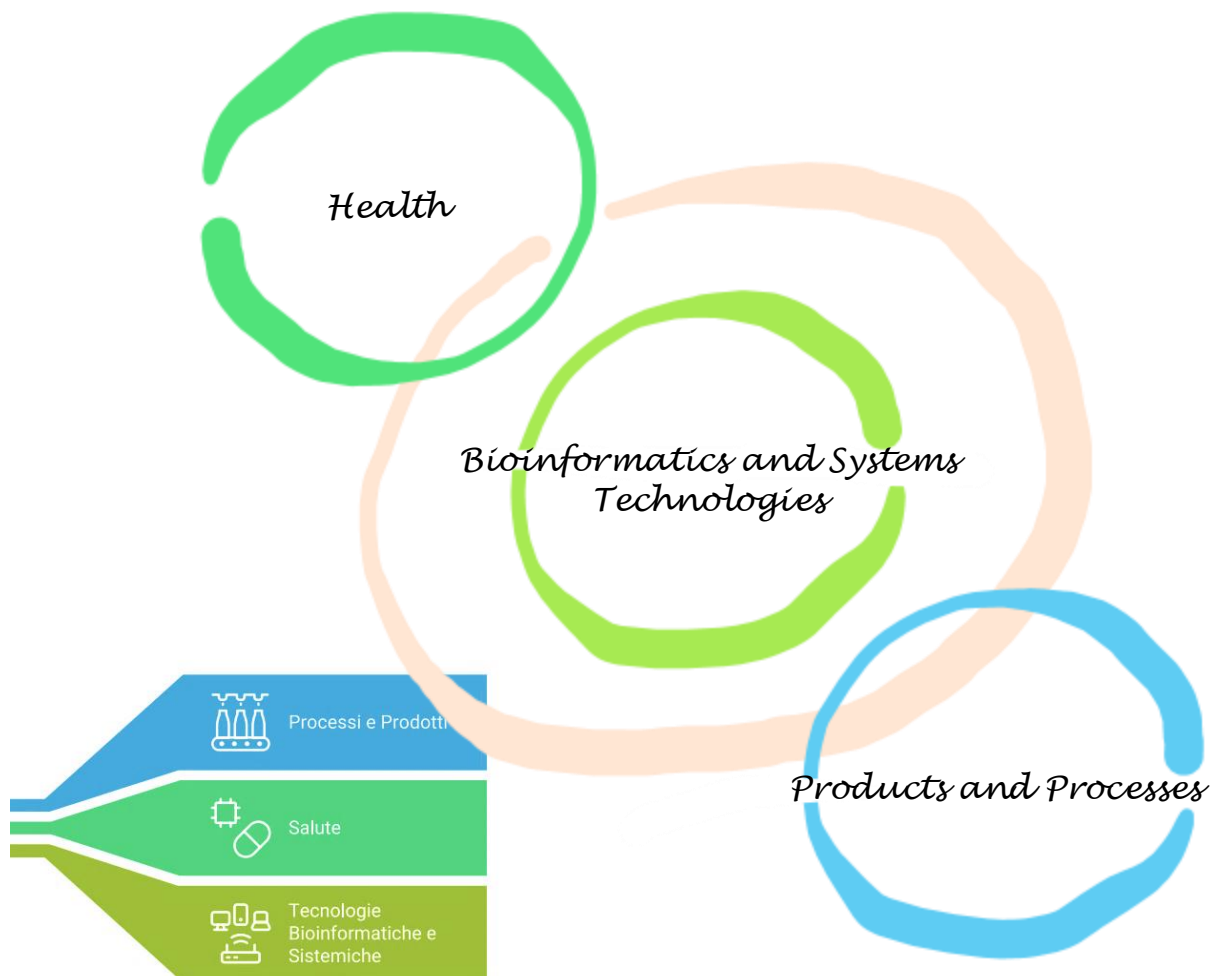
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# *QUESTIONS*

