

The Basics of Computational Biology and Medical Sciences:

Scope of questions and recommended textbooks for study

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Scope of questions

In *the basics of computational biology and medical sciences*, half of the questions will be taken from the fundamentals of life sciences and the other half from the fundamentals of information sciences.

Fundamentals of Life Sciences

- Basic Structure of Organisms and Cells
- Proteins and Enzymes
- Genome and Genes
- Gene Expression and Regulation
- Cell Cycle and DNA Replication
- Intracellular Transport and Degradation
- Energy Production
- Infection and Immunity
- Reproduction and Genetics
- Biotechnology

Fundamentals of Information Sciences

- Representation of Numbers, Letters, and Pictures
- Computer Architecture and Operation
- Web Technology and Networks
- Databases and Storage
- Probability Distributions, Statistical Testing and Estimation
- Algorithms, Data Structures, and Programming
- Encryption and Privacy
- UNIX Commands
- Spreadsheet Tools
- Machine Learning and Evaluation of Models

Recommended textbooks for study

We recommend the following textbooks to help you prepare for the basics of computational biology and medical sciences. This does not imply that questions will be asked strictly on the content of these textbooks. However, this does not mean that the questions will be strictly based on the content of these textbooks. The listed textbooks are written in Japanese. We are currently seeking equivalent textbooks for English speakers; please let us know if you have any recommendations.

- 理系総合のための生命科学 第5版～分子・細胞・個体から知る“生命”のしくみ
<https://www.yodosha.co.jp/yodobook/book/9784758121026/>
- 高校情報 I Python 実教出版
<https://www.jikkyo.co.jp/book/detail/22023322>