| 科目ナンバリング | U-LAS14 20060 SE68 | | | | | | |
|---|---|---|---|---|---|---|---|
| 授業科目名<英訳> | Introduction to Biological Data Analysis -E2<br>Introduction to Biological Data Analysis-E2 | | | 担当者所属職名・氏名 | 薬学研究科　准教授　Martin Robert | | |
| 群 | 自然科学科目群 | | | 分野(分類) | 生物学(各論) | 使用言語 | 英語 |
| 旧群 | B群 | 単位数 | 2単位 | 週コマ数 | 1コマ | 授業形態 | 演習（対面授業科目） |
| 開講年度・開講期 | 2026・前期 | 曜時限 | 木4 | 配当学年 | 全回生 | 対象学生 | 理系向 |

**[授業の概要・目的]**

Biology has become a data rich science. Once lagging behind physicists for many years, biologists are now accumulating large amounts of quantitative data from DNA and protein sequence (genome projects) to large scale analysis of the expression of proteins and metabolites and their interactions. Consequently, numerous databases and resources have emerged to organize, distribute, and make possible the analysis of this huge amount of data.

In this course students will learn about common types of biological data that are rapidly accumulating and the related databases. They will learn to use some powerful online databases and tools that do not necessarily require programming skills. Students will use those tools to analyze DNA and protein sequences, visualize the outcome of large-scale experiments and biological networks, and learn how they can be used to derived knowledge and understanding about the system under study.

**[到達目標]**

By the end of this course participants should be able to:
- Understand and explain some of the common types of quantitative biological data
- Find and analyze DNA or protein sequences using different databases, repositories, and tools
- Exploit linked resources to expand knowledge across data types and resources
- Explore the genome and metabolic network of model organisms
- Analyze data from a model organism of choice to answer  particular biological questions
- Gain better understanding of a biological systems through data analysis and interpretation

**[授業計画と内容]**

The following topics and their feedback will be covered over the course of 14 classes, not necessarily in that order:

Week 1 Guidance
Week 2 Biochemistry and biomolecules review
Week 3-4 Genomic and proteomic analysis methods and data
Week 5 Introduction to PubMed and sequence databases
Week 6-7 Introduction to sequence analysis using BLAST
Week 8-9 The UniProt database (features, tools, analysis)
Week 10 The KEGG database (features, tools, analysis)
Week 11 The Biocyc and Ecocyc databases (features, tools, analysis)
Week 12-13 Introduction to biological network analysis
Week 14 Project presentation
Week 15 Final examination
Week 16 Feedback

Introduction to Biological Data Analysis-E2(2)へ続く↓↓↓

Introduction to Biological Data Analysis-E2(2)

**[履修要件]**

The course is targeted to beginners. A basic familiarity with biomolecules and cell biology is desirable but not essential.
Students should bring a computer to class to complete in-class exercises and tutorials as well as homework assignments.

**[成績評価の方法・観点]**

20% Class attendance and participation
40% In-class exercises and homework assignments
20% Final examination
20% Project

**[教科書]**

**使用しない**

**[参考書等]**

**（参考書）**
Reference material and resources will be derived from various sources that will be announced in class.

**[授業外学修（予習・復習）等]**

Out of class activities will mainly be for assigned readings and homework assignments and for working on a project. Students should expect to spend about 1-2 hours per week preparing for the class and completing assignments.

**[その他（オフィスアワー等）]**

Announced during class.

**[主要授業科目（学部・学科名）]**

**薬学部薬科学科、薬学部薬学科**