



**BIMM143**

**Hands-on Lab Session**

**Class 01**

**Barry Grant**

**UC San Diego**

<http://thegrantlab.org>

**Introduce Yourself!**


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**On Piazza...**

<http://thegrantlab.org/bimm143/>

UC San Diego

## BIMM 143

A hands-on introduction to the computer-based analysis of genomic and biomolecular data from the [Division of Biological Sciences, UCSD](#) .

[Overview](#)

[Schedule](#)

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# Introduce Yourself!

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05:00

# On Piazza...

 New Post

[Title:] Your **neighbor's** name & Table Number


[Body:] Place they identify with most,  
Major area of study/research,  
Fun fact or favorite **joke!**

[Folder/tag:] 

# Due Dates

UC San Diego

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<http://thegrantlab.org/bimm143/>

Week 1

UC San Diego

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## Schedule

All course delivery for Fall 2025 will be online via this public facing website. New class content will be posted on a weekly basis throughout the quarter. Clicking on the topics below will take you to corresponding video lectures, hands-on “lab sessions” supporting walk-through screencasts, required reading material and homework assignments.

#	Week	Topics
0	10/01/20	<b>Getting Oriented</b> Course introduction, Learning goals & expectations, Meet the instructional team. Setup your computer with required software.
1	10/05/20	<b>Welcome to Bioinformatics</b> Biology is an information science, History of Bioinformatics, Types of data, Application areas and introduction to upcoming course segments, Hands on with major Bioinformatics databases and key

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Week 1

**UC San Diego**

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Week 1

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### Week 1: Welcome to Bioinformatics

**Topics:** Biology is an information science, History of Bioinformatics, Types of data, Application areas and introduction to upcoming course segments, Introduction to NCBI & EBI resources for the molecular domain of bioinformatics, Hands-on session using NCBI-BLAST, Entrez, GENE, UniProt, Muscle and PDB bioinformatics tools and databases.

**Goals:**

- Understand the increasing necessity for computation in modern life sciences research.
- Get introduced to how bioinformatics is practiced.
- Be able to query, search, compare and contrast the data contained in major bioinformatics databases (GenBank, GENE, UniProt, PFAM, OMIM, PDB) and describe how these databases intersect.
- The goals of the hands-on session is to introduce a range of core bioinformatics databases and associated online services whilst actively investigating the molecular basis of several common human disease.

**Videos:**

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- The goals of the hands-on session is to introduce a range of core bioinformatics databases and associated online services whilst actively investigating the molecular basis of several common human disease.

**Videos:**

- 1.1 - [Introduction to bioinformatics \(what, where and why of bioinformatics\)](#) [↗](#),
- 1.2 - [Major bioinformatics resource providers \(NCBI and EBI\)](#) [↗](#),
- 1.3 - [A quick tour of major NCBI and EBI resources \(GENE, UniProt, GO, OMIM, PDB, PFAM\)](#) [↗](#).

**Supporting Material:**

- Lecture Slides: [Large PDF](#) [↗](#), [Small PDF](#) [↗](#),
- Handout: [Major Bioinformatics Databases](#) [↗](#),
- Lab: [Hands-on section worksheet](#) [↗](#), 
- Lab: [Live-stream video walk-through](#) [↗](#) live on Thur @ 10am SD time,
- Office/Student Hours: [Zoom on Thur @ 12:30pm SD time](#) [↗](#),

# Hands-on section

<http://thegrantlab.org/bimm143/>

Do it Yourself!

The screenshot shows a web browser window with the address bar displaying `bioboot.github.io/bimm143_F22/class-material/lab1.pdf`. The browser's address bar includes navigation icons (back, forward, refresh) and utility icons (share, star, zoom, print). Below the browser window, a PDF viewer interface is visible. The viewer's toolbar shows the document title 'Class 1 Lab', page number '1 / 23', zoom level '100%', and icons for zooming, rotating, and a download icon (a square with a downward arrow) which is highlighted with a red box. A large red arrow points upwards towards the download icon. The main content area of the PDF viewer displays the following text:

**Class 1 Lab\***  
Bioinformatics Databases and Key Online Resource

Barry Grant

Version 220919

**i Instructions**

Save this document to your computer and open it in a PDF viewer such as Preview (available on every mac) or Adobe Acrobat Reader ([free for PC and Linux](#)). Be sure to add your name and UC San Diego personal identification number (PID) and email below before answering all questions in the space provided.

Student Name                      UCSD PID                      UCSD Email

Below the text are three light blue input fields for the student's name, UCSD PID, and UCSD email.

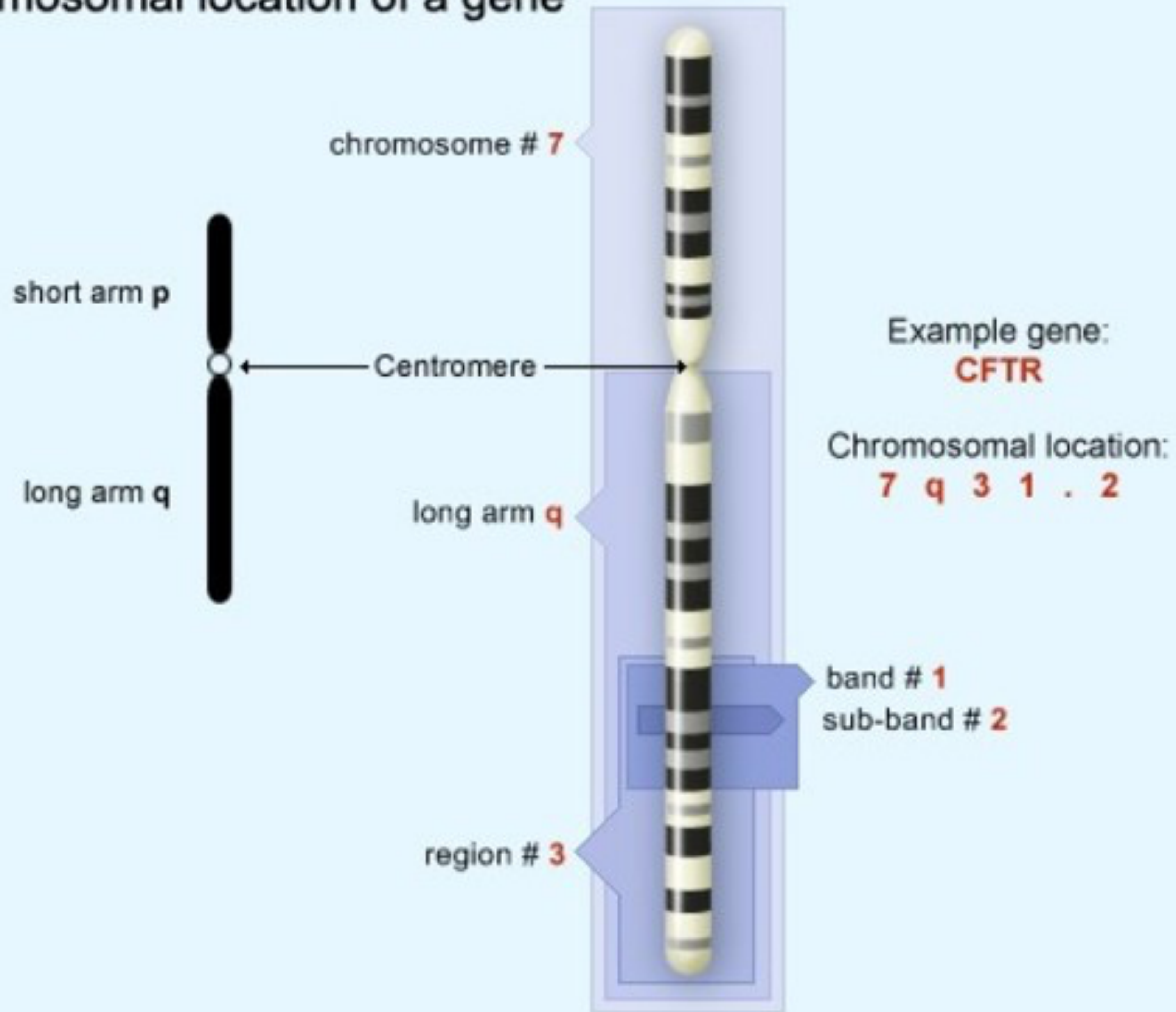
# GUIDED WALKTHROUGH

- There are **four** major hands-on sections including:
  1. BLAST, GenBank and OMIM @ **NCBI** [~25 mins]  
— BREAK [10 mins]—
  2. GENE database @ **NCBI** [~20 mins]  
— BREAK [5 mins]—
  3. UniProt & Muscle @ **EBI** [~20 mins]  
— BREAK [10 mins]—
  4. PFAM, PDB & NGL [~25 mins]
- ▶ Please do answer the last review question (**Q19**).
- ▶ We encourage discussion @ your Table and on **Piazza!**

# GUIDED WALKTHROUGH

- There are **four** major hands-on sections including:
  1. BLAST, GenBank and OMIM @ **NCBI** [9:40 - 10:05am]  
— BREAK [10 mins]—
  2. GENE database @ **NCBI** [10:15 - 10:35am]  
— BREAK [5 mins]—
  3. UniProt & Muscle @ **EBI** [10:40 - 11:00am]  
— BREAK [10 mins]—
  4. PFAM, PDB & NGL [11:10 - 11:35am]
- ▶ Please do answer the last review question (**Q19**).
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# Chromosomal location of a gene



# Summary

- Bioinformatics is computer aided biology.
- Bioinformatics deals with the collection, archiving, organization, and analysis of a wide range of biological data.
- The NCBI and EBI are major online bioinformatics service providers.
- Introduced Gene, UniProt, PDB databases as well as a number of 'boutique' databases including PFAM and OMIM.

## Homework:

- Answer the [01\\_HW\\_quiz](#) questions on [GradeScope](#) ,
- Submit your completed [01\\_Lab\\_report](#) (i.e. filled in PDF form) to [GradeScope](#) ,
- Readings:
  - PDF1: [What is bioinformatics? An introduction and overview](#) ,
  - PDF2: [Advancements and Challenges in Computational Biology](#) .

# Due Dates

- All assigned work (**lab repots** and **homework**) is due on Monday at 12pm each week.
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