Genome Solver - Complete Set of Lessons
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Module Description:

The Genome Solver Project began as a way to teach faculty some basic skills in bioinformatics - no coding or scripting. These Lessons also work well in the undergraduate classroom, culminating with an authentic community research project.

There are 6 Lessons in the Genome Solver Project

- Lesson I - Introduction

- Lesson II - Databases

- Lesson III - Annotation

- Lesson IV - Comparative Genomics

- Lesson V - Phylogenetics

- Lesson VI - The Community Science Project on Horizontal Gene Transfer

Each lesson contains a slide deck and transcript. Lessons II - V also have exercises to

practice the tools introduced in that slide deck. Each of the first five lessons takes an hour or less of class time. By working through the first 5 lessons, participants will have the skills necessary to participate in the Community Science Project, an effort to understand the extent to which exchanges of genetic material from bacteriophages and bacteria drives bacterial diversity and evolution.

All 6 lessons have been shared as a series. To access each lesson from the full resource record, scroll down the page to find individual links to each lesson listed under "Contents".

Teaching Setting:

These materials can be used to provide training for undergraduate educators or students in the fundamentals of bioinformatics.

QUBES Citation:

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Related Materials and Opportunities:

Genome Solver began in 2012 with the goal to create a community of undergraduate educators interested in the Human Microbiome Project (HMP) as a means to teach the fundamentals of bioinformatics.   Since then, Genome Solver instructors have provided training to more than 250 faculty members from approximately 125 institutions in a 1- or 2-day workshop. While no additional workshops are currently being scheduled, you can still get the Genome Solver workshop experience. The workshop content and a horizontal

gene transfer project have been refurbished and are now available in this resource, which are also available [on their site](#).

Genome Solver has recently moved their website onto QUBES (http://genomesolver.qubeshub.org). *Please note that the old Genome Solver site, https://genomesolver.org, has been shut down as of January 1, 2019.* Genome Solver has exciting plans to grow their capabilities over the next year, including the possibility for online workshops using QUBES Faculty Mentoring Networks tools. Genome Solver is also continuing to add materials to their site. A "pre-lesson" about BLAST for people who need a review will be available soon and a lesson on synteny is currently under development. **You are encouraged to** [visit the new Genome Solver site](#) **and** [join the group](#) **in order to stay apprised of upcoming activities and opportunities.**

The members of the Genome Solver leadership team are also involved in two additional projects who have partnered with QUBES.

- The [Network for Integrating Bioinformatics into Life Sciences Education (NIBLSE)](#), which has a number of [bioinformatics curriculum resources](#) available.

- The [Genomics Education Alliance (GEA)](#), which is a consortium made up of groups like Genome Solver that are interested in undergraduate education in bioinformatics and genomics. [Please see their white paper here.](#) GEA was recently awarded an NSF Research Coordination Network grant to bring the alliance together. If you're interested in learning more, please contact Anne (rosenwaa@georgetown.edu).

If you adopt and adapt this module, you are highly encouraged to share your adaptation back with the QUBES community using the QUBES Resources System for sharing Open Education Resources.

QUBES on Social Media

QUBES is a community of math and biology educators who share resources and methods for preparing students to use quantitative approaches to tackle real, complex, biological problems.