Each QUBES Resource of the Week highlights openly licensed materials shared by QUBES users and partners.

Genome Solver - Complete Set of Lessons
By Anne Rosenwald, Gaurav Arora, and Vinayak Mathur

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 five 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 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 and students in the fundamentals of bioinformatics.

QUBES Citation:

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 Mentorship 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 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
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)](https://www.niblse.org/), which has a number of bioinformatics curriculum resources available.

- The [Genomics Education Alliance (GEA)](https://www.genealliance.org/), which is a consortium made of groups like Genome Solver that are interested in undergraduate education in bioinformatics and genomics. [Please see their white paper here.](https://www.genealliance.org/whitepaper/) 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**

- Twitter
- Facebook
- RSS
- Email

**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.