# *De Novo* Genome Assembly using Short Reads

## Platform

Exercises for this demo will be carried out on a virtual machine running Ubuntu. Ubuntu is an open source distribution of the Linux operating system.

To run the virtual machine, you will use the program VirtualBox, which can be downloaded at the following website: https://www.virtualbox.org/wiki/Downloads

The virtual machine image has been prebuilt with the necessary software. The virtual machine image can be downloaded from the following link: https://drive.google.com/file/d/0BxoXt7fkRSWvVGo3eUdQRXNyb0U

Once you have downloaded VirtualBox and the virtual machine image, you will need to set up the virtual machine within VirtualBox. To do so, click on "New" at the top of the VirtualBox Manager, and follow the walk through instructions to set up the virtual machine. When you get to the VM Name and OS Type step, set the Operating System to be "Linux," and the Version to be "Ubuntu" (do not select "Ubuntu 64 bit"). Name the image "genome_assembly_worksop_demo". The next step will be for Memory. I suggest setting this to 1024 MB. Next you select the Virtual Hard Disk. Make sure the box for "Start-up Disk" is checked, and select the option "Use existing hard disk". The dropdown box should be empty. To add a disk to this, click on the folder icon (with a green arrow) to the left of the dropdown box, and locate the virtual machine image you just downloaded and extracted. Click "Continue" and then "Create".

Now that you have your virtual machine setup, you can boot it up. From the VirtualBox Manager, double-click on the machine "genome_assembly_worksop_demo" to boot the machine. Once it has completed booting, you will need to login. The username is "ubuntu" and the password is "reverse".

When you are signed in, you will need to open Terminal, the command-line interface. This is where all your work will be carried out. You can open Terminal by clicking on the icon  on the left panel. It is highly recommended that you maximize the screen once you have it opened. This will make it much easier to read the output of programs you will run.

Although it is not necessary, installing the Guest Additions is recommended. This will allow you to display the virtual machine full screen. To do so, click the "Devices" tab at the top of the virtual machine screen, and select the option "Install Guest Additions". The installer will launch automatically and prompt you. Select "Run" and when prompted for a password, enter "reverse" and select "Authenticate". A Terminal screen will pop and print the progress of the installer to the screen. When the installation is complete, hit "Return" to close the window. For the Guest Additions to take effect, you will need to restart the virtual machine. To do so, click on the power-button icon on the upper right corner of the screen and select "Shut Down", and select "Restart". Once the machine restarts, log back in and you will now be able to enter full screen mode (with Ctrl-F or ⌘-F), and increase the window size to your preference.