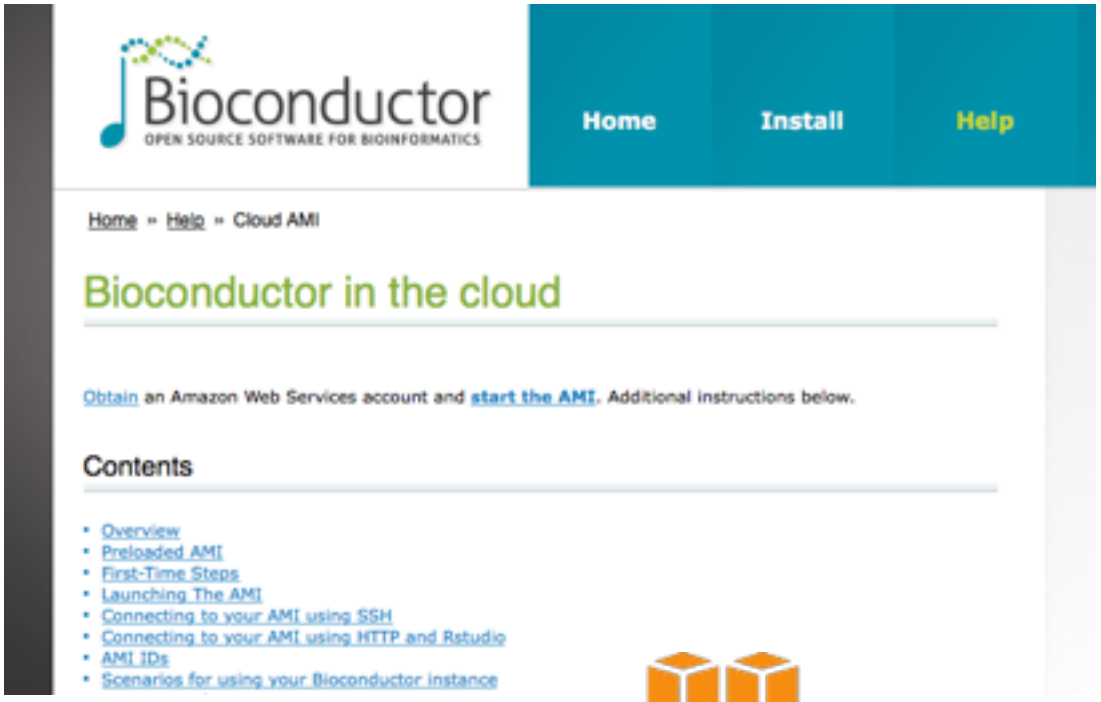
Using Cloud Computing for Workshops

- **Problem:** Setting up the computing environment on each participant's computer takes time away from workshop content; versioning can cause problems

- **Solution:** Provide each participant with a cloud server with a preconfigured environment to access and use during the workshop

Bioconductor supports preconfigured AMIs



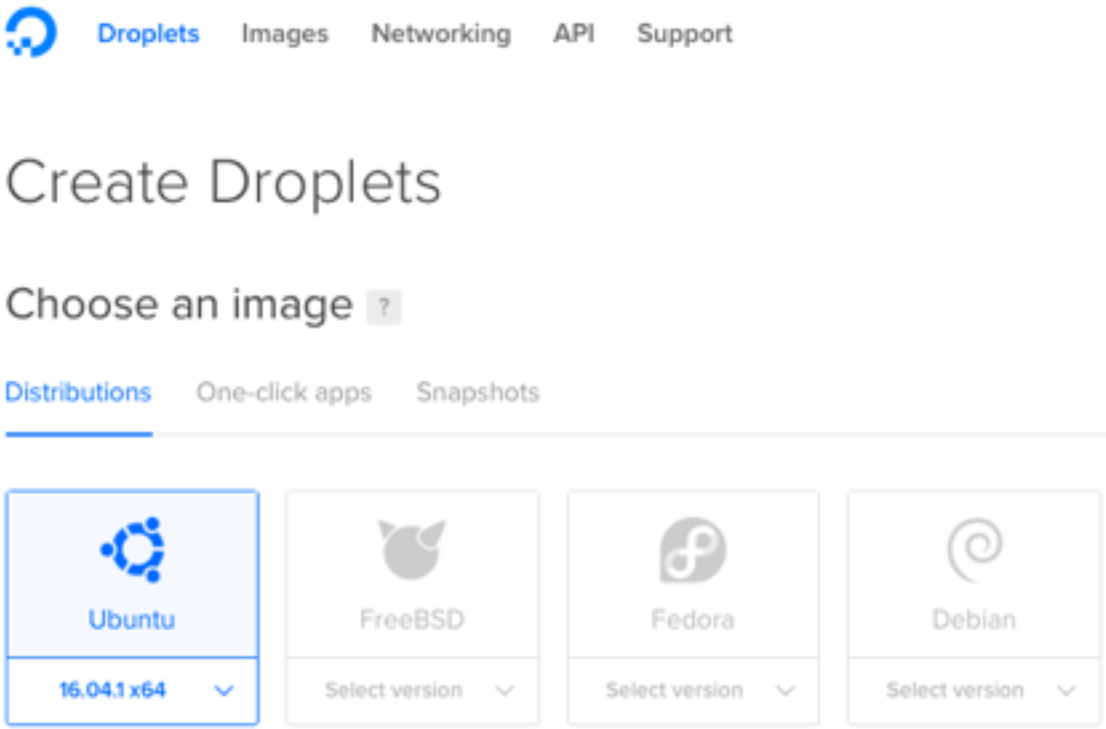
Pros:

- Pre-loaded with latest R version, top 80 BioC software pkgs plus many annotation packages
- Supported & updated

Cons:

- Limited customizability of AMI properties
- Pricing structure can be confusing (e.g. bidding on Spot Instances)

Digital Ocean



Pros:

- Fully customizable droplet properties
- Simple pricing structure

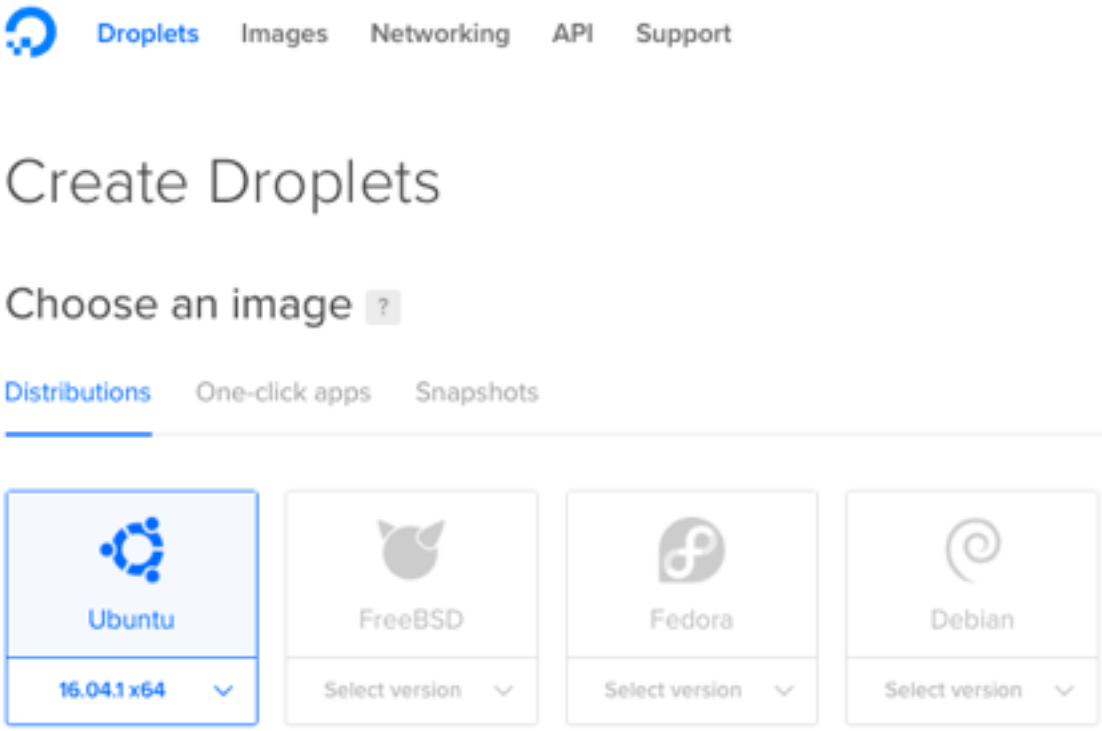
Cons:

- All setup of R/Rstudio Server, packages, etc done manually

Steps to Create Rstudio Server Instances

1. Launch empty droplet (instance)
   - Choose OS version, RAM, # cores, disk size, location, etc
2. Configure environment
   - Install R, Rstudio Server, packages, etc
3. Take a snapshot image
4. Launch many droplets based on snapshot

1. Launch empty droplet



1. Launch empty droplet

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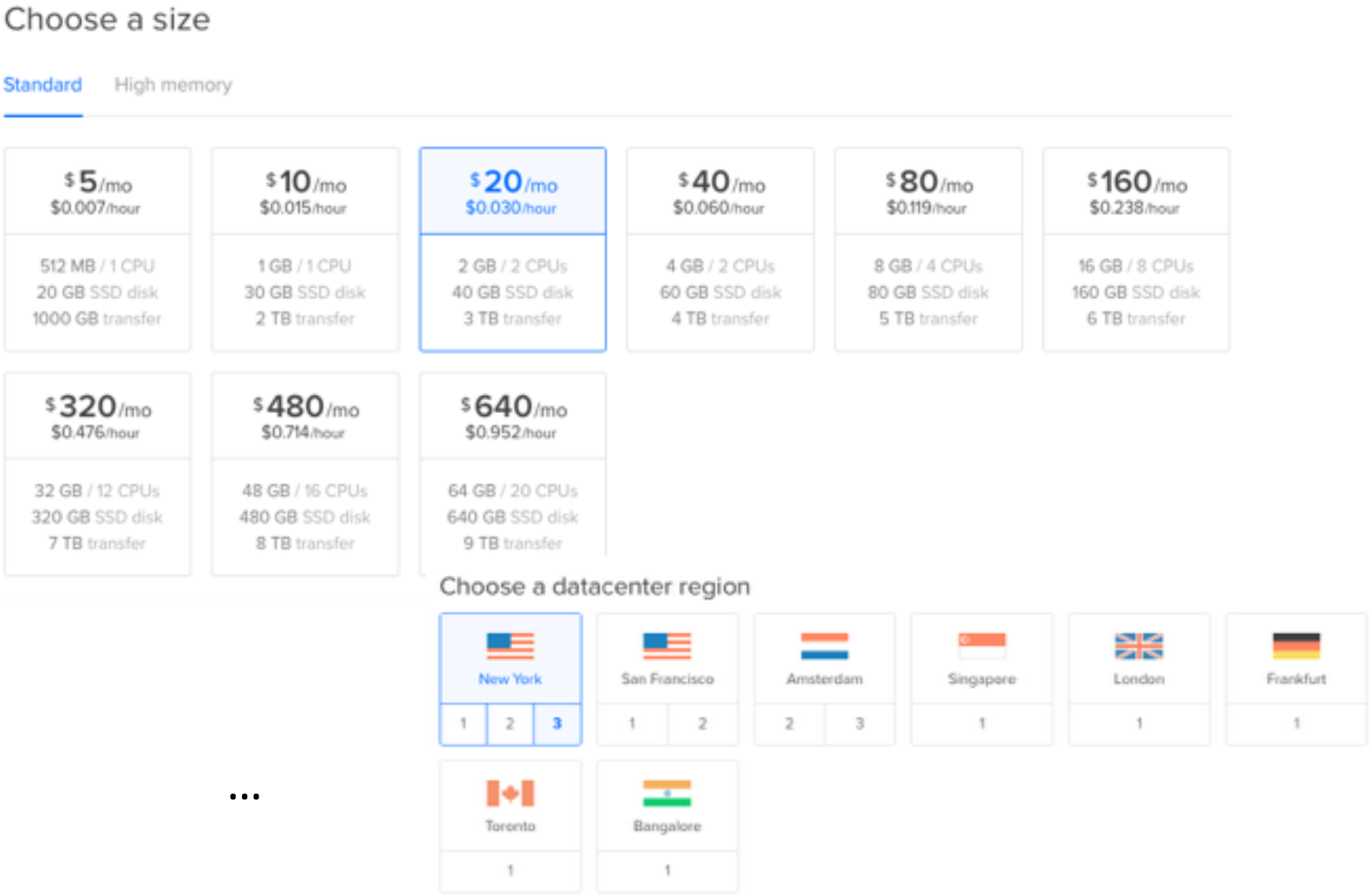

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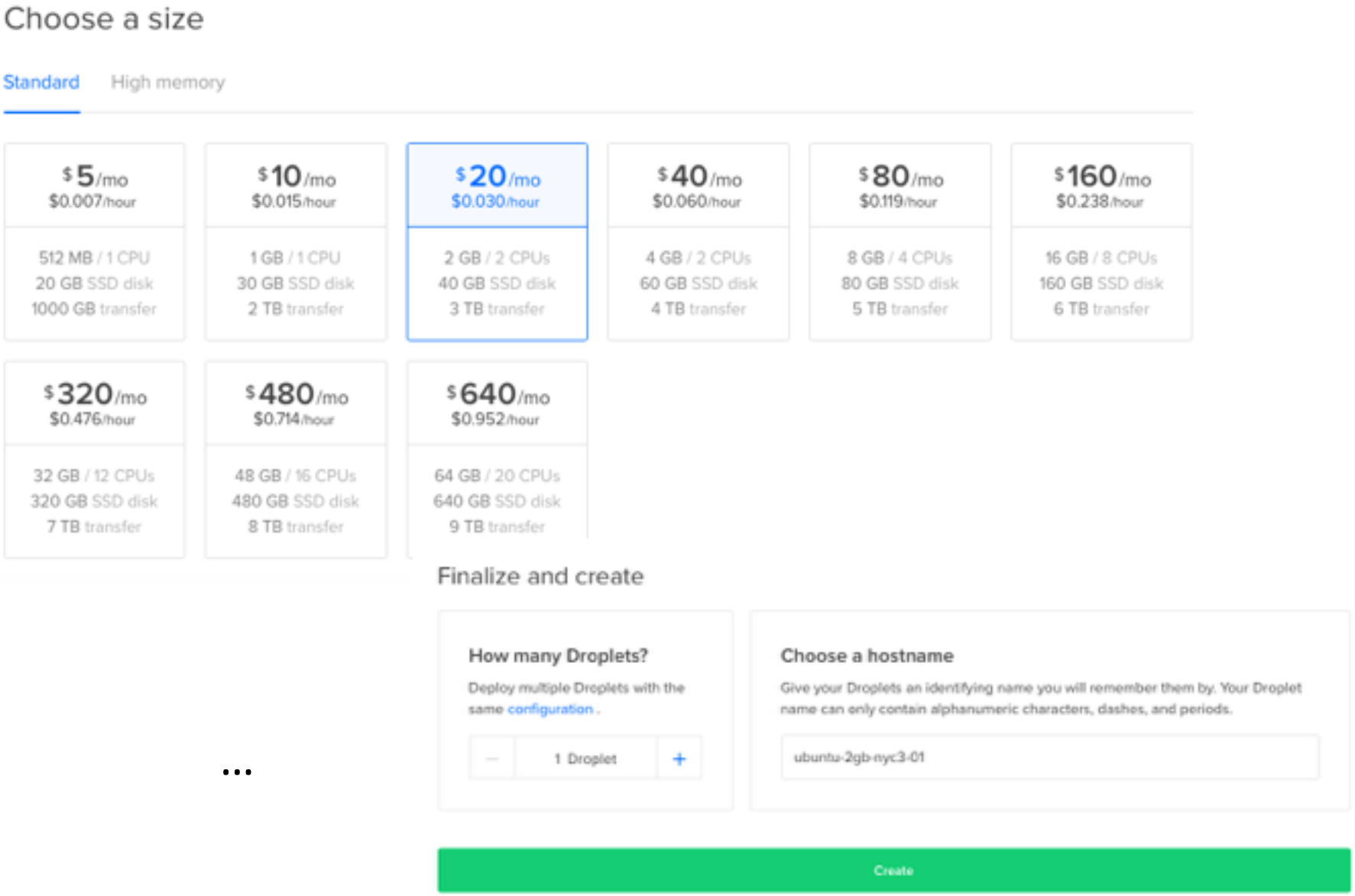

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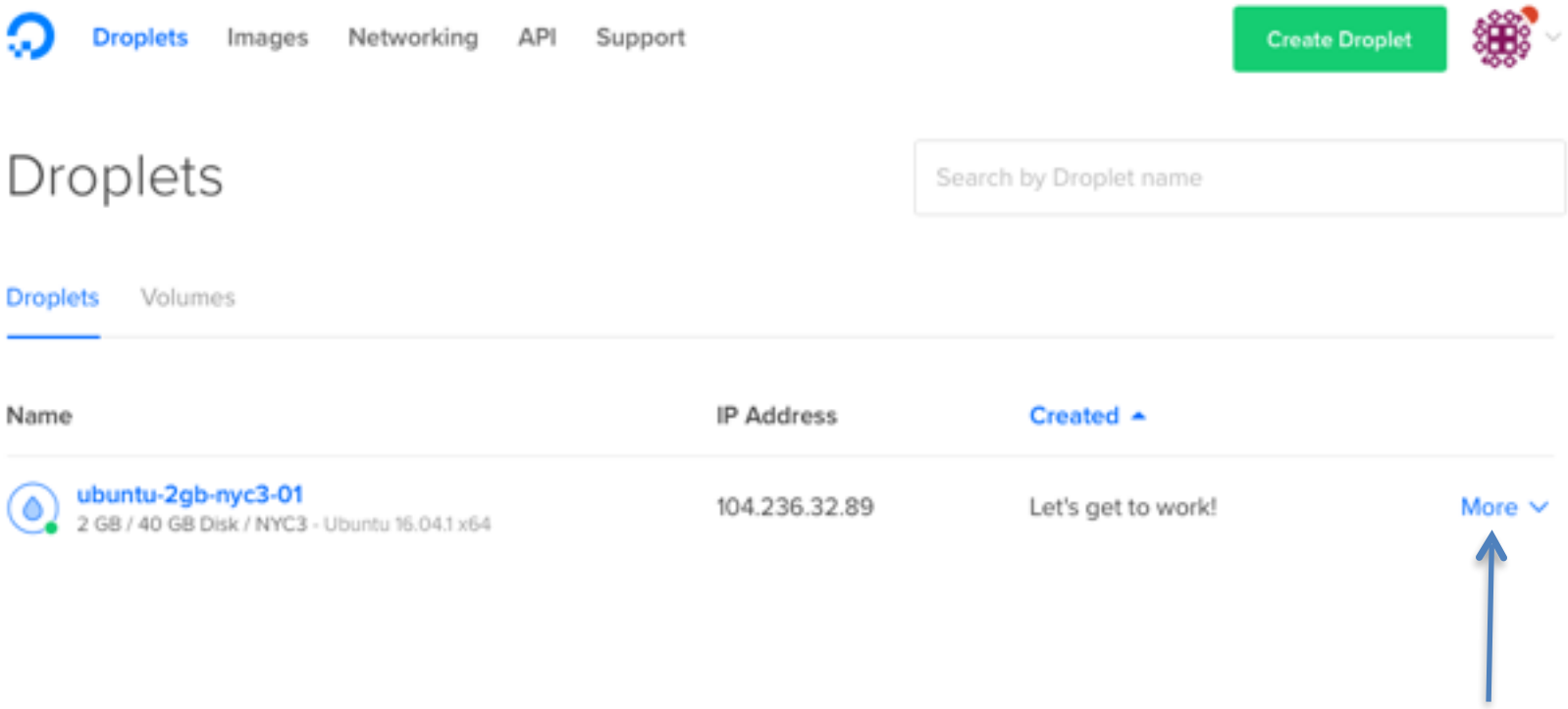
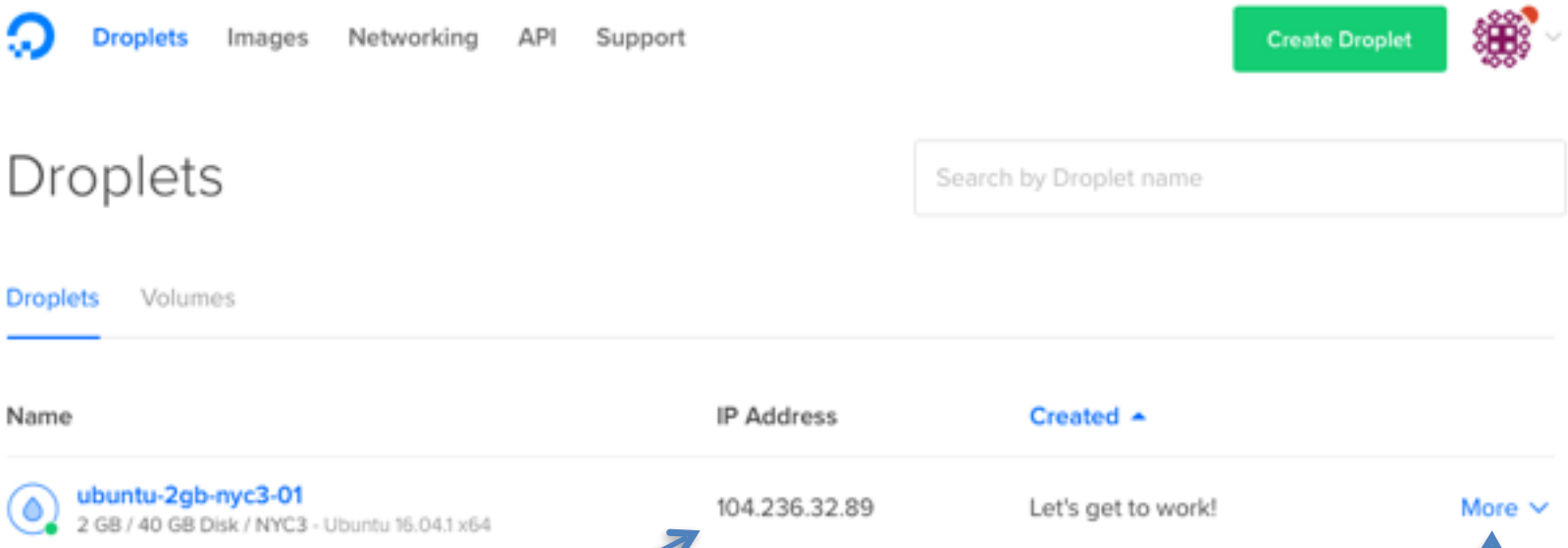
2. Configure Environment



Options here to delete, resize, etc

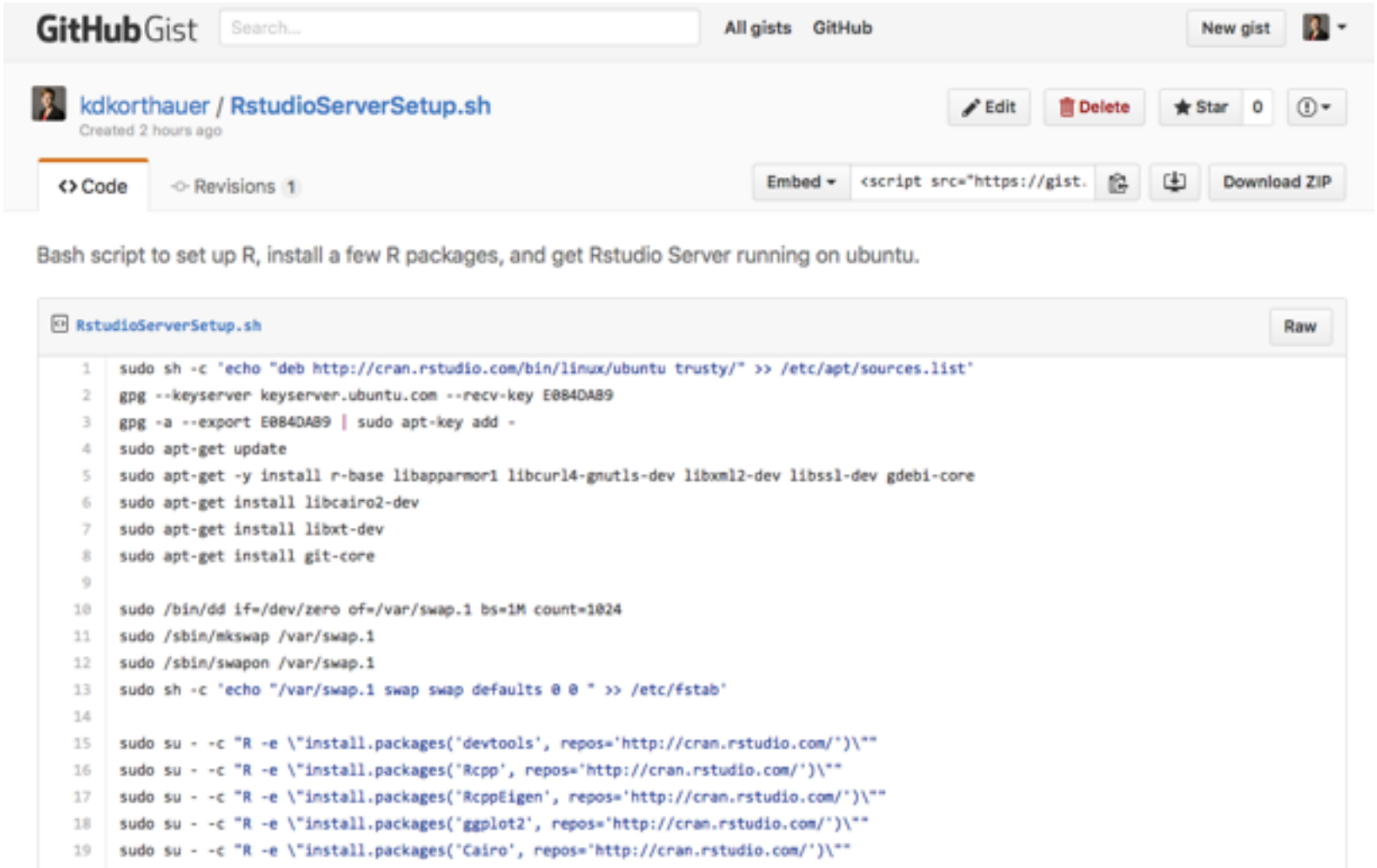
2. Configure Environment



SSH into this IP address using username and password emailed to you

Options here to delete, resize, etc

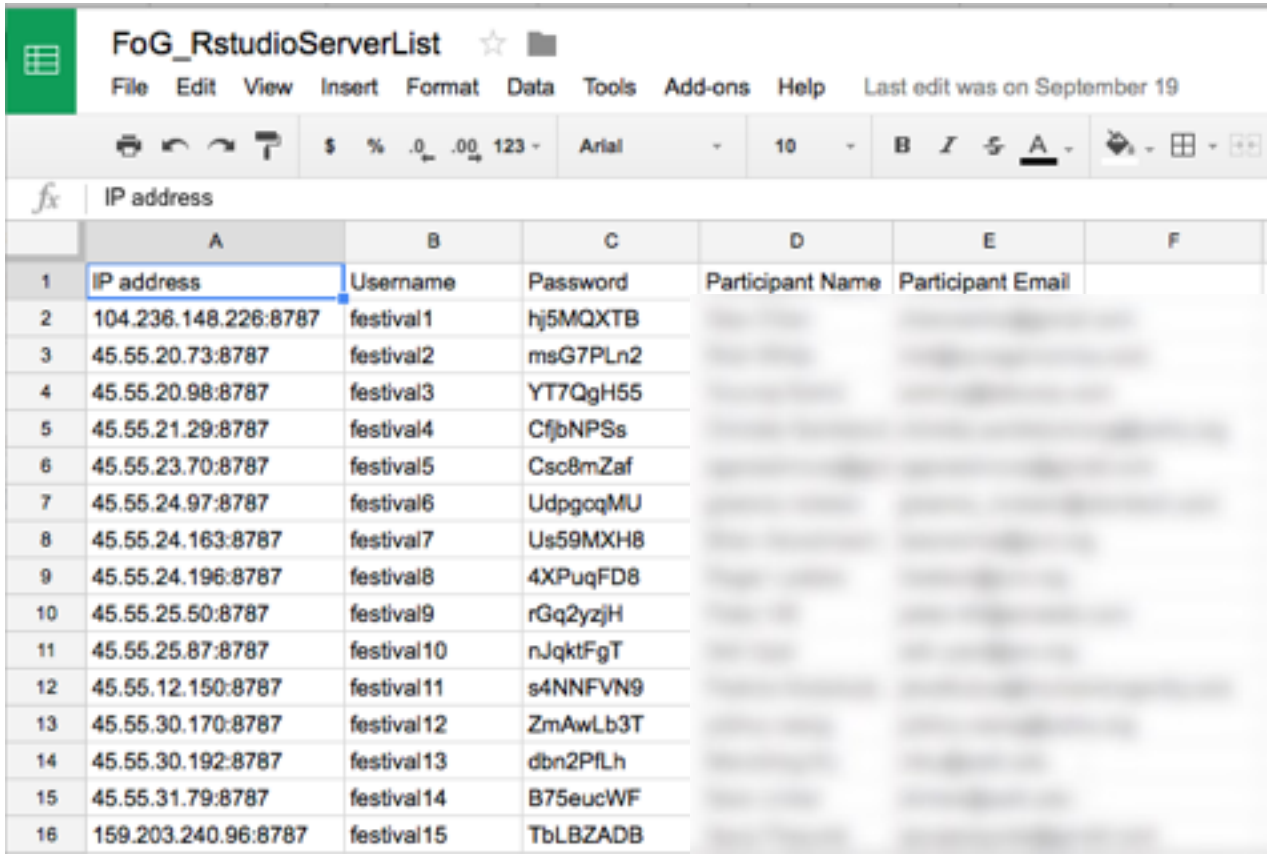
2. Configure Environment



GitHub Gist: /kdkorthauer/RsudioServerSetup.sh

2. Configure Environment

- Create a non-root account for yourself with sudo privileges, e.g. ‘adduser keegan sudo’
- Set up an account for each user with a password and homedir using the ‘adduser’ command



FoG_RstudioServerList

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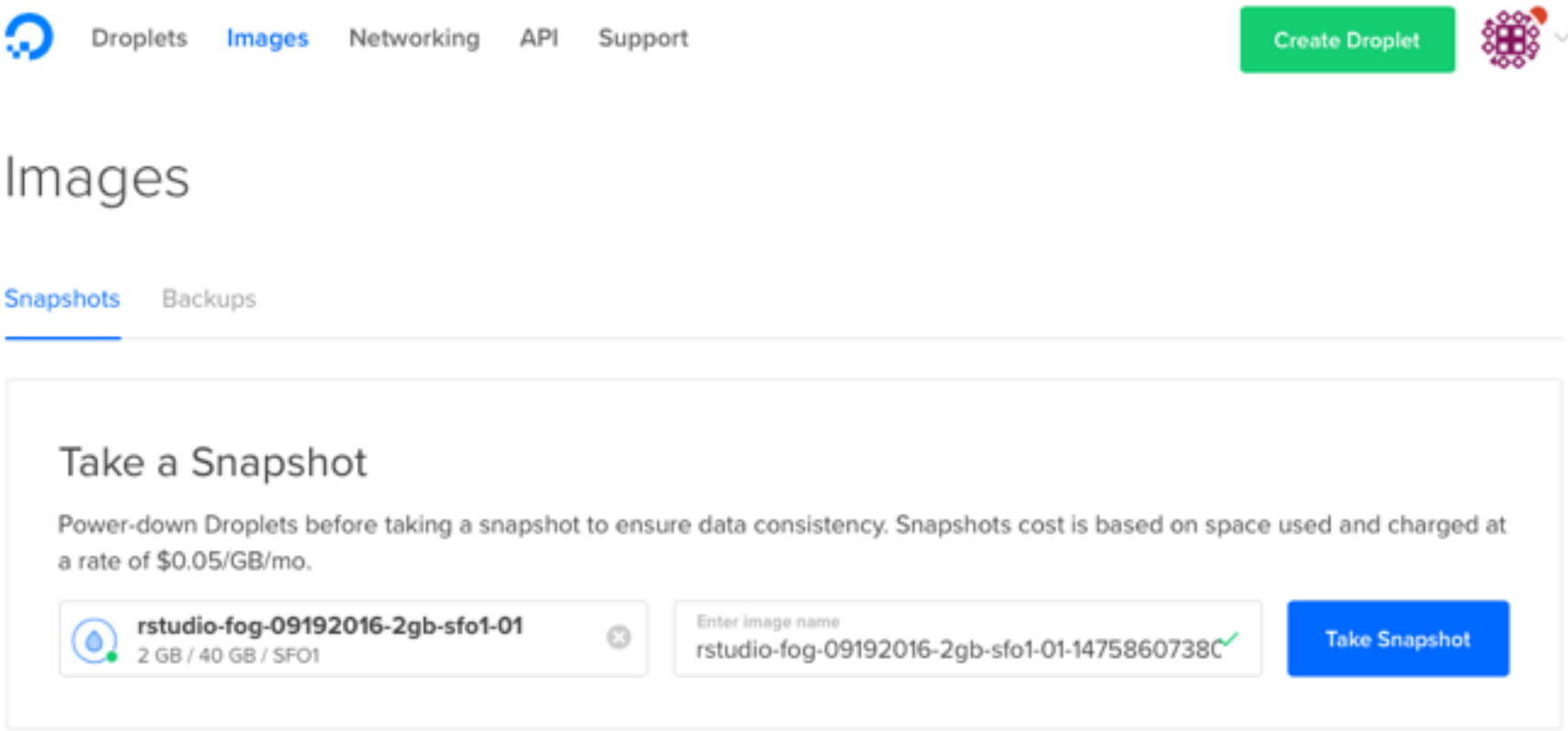
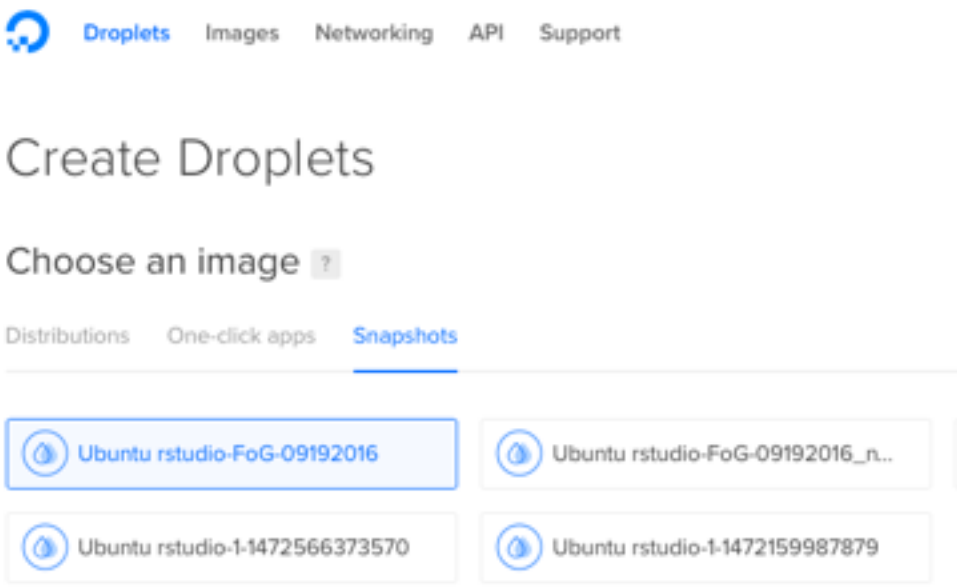
IP address

	A	B	C	D	E	F
1	IP address	Username	Password	Participant Name	Participant Email	
2	104.236.148.226:8787	festival1	hj5MQXTB			
3	45.55.20.73:8787	festival2	msG7PLn2			
4	45.55.20.98:8787	festival3	YT7QgH55			
5	45.55.21.29:8787	festival4	CfjbNPSs			
6	45.55.23.70:8787	festival5	Csc8mZaf			
7	45.55.24.97:8787	festival6	UdpgcqMU			
8	45.55.24.163:8787	festival7	Us59MXH8			
9	45.55.24.196:8787	festival8	4XPuqFD8			
10	45.55.25.50:8787	festival9	rGq2yzjH			
11	45.55.25.87:8787	festival10	nJqktFgT			
12	45.55.12.150:8787	festival11	s4NNFVN9			
13	45.55.30.170:8787	festival12	ZmAwLb3T			
14	45.55.30.192:8787	festival13	dbn2PfLh			
15	45.55.31.79:8787	festival14	B75eucWF			
16	159.203.240.96:8787	festival15	TbLBZADB			

3. Take a snapshot image



4. Launch many droplets based on snapshot



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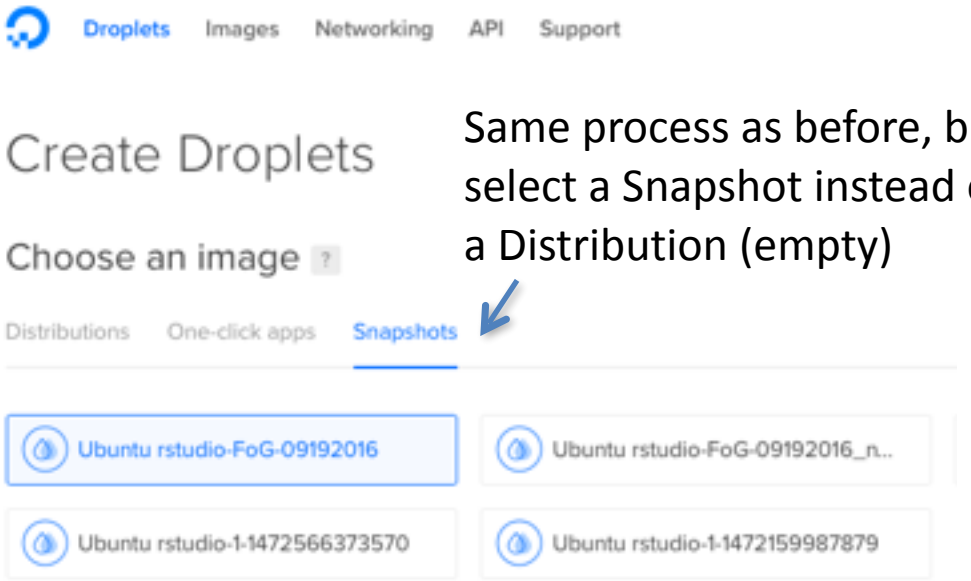
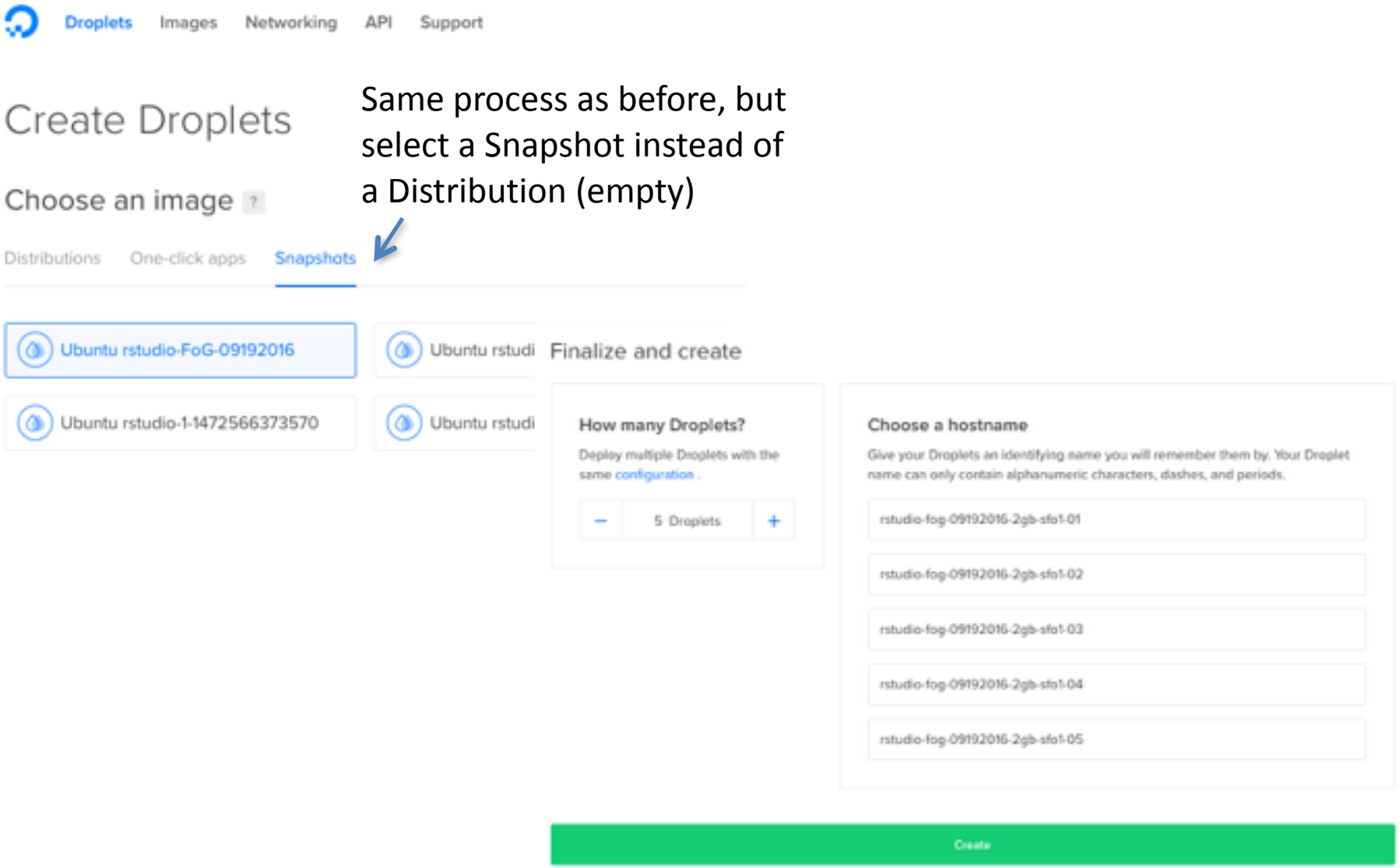


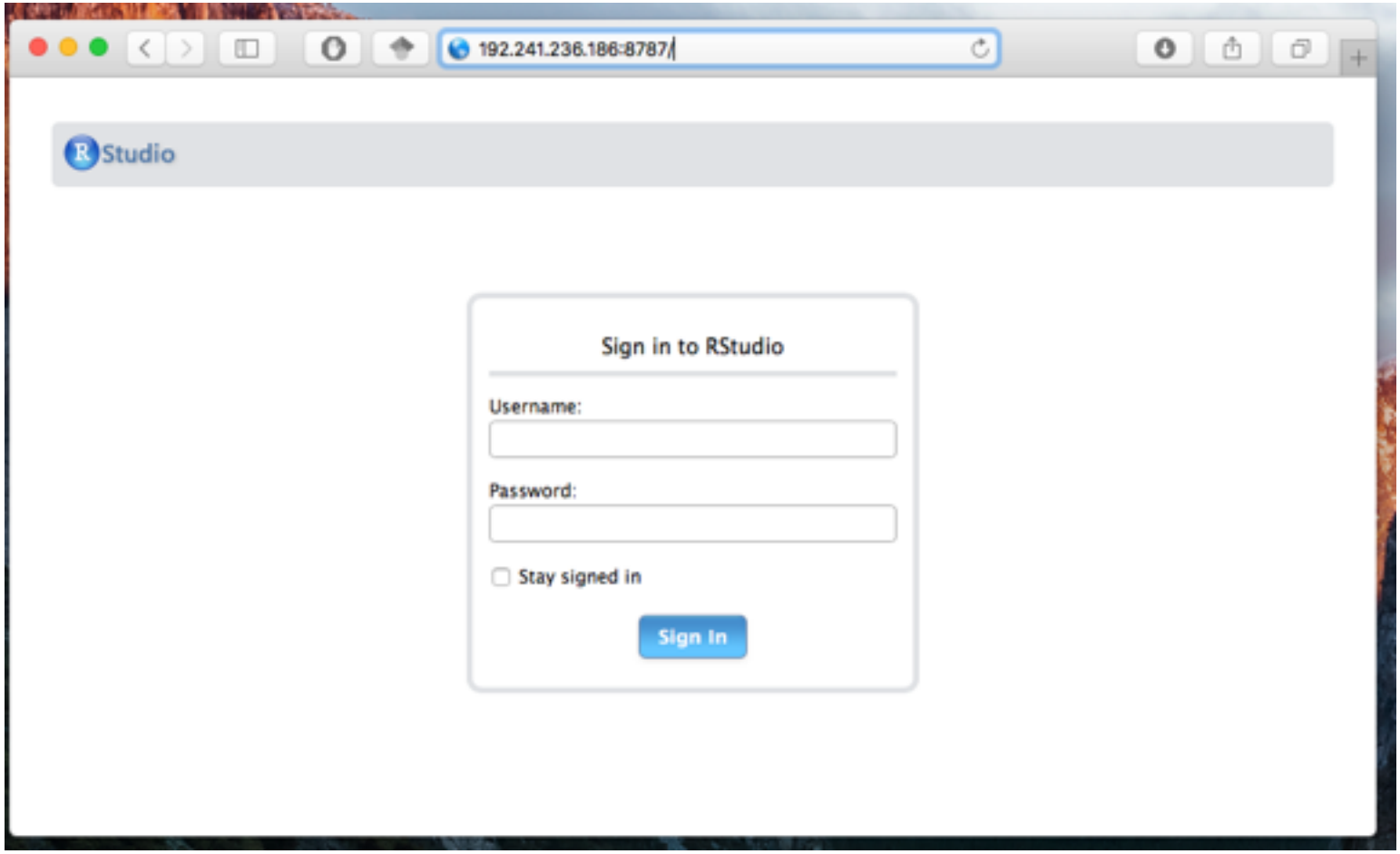
Same process as before, but select a Snapshot instead of a Distribution (empty)

4. Launch many droplets based on snapshot



Same process as before, but select a Snapshot instead of a Distribution (empty)

End Result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RStudio
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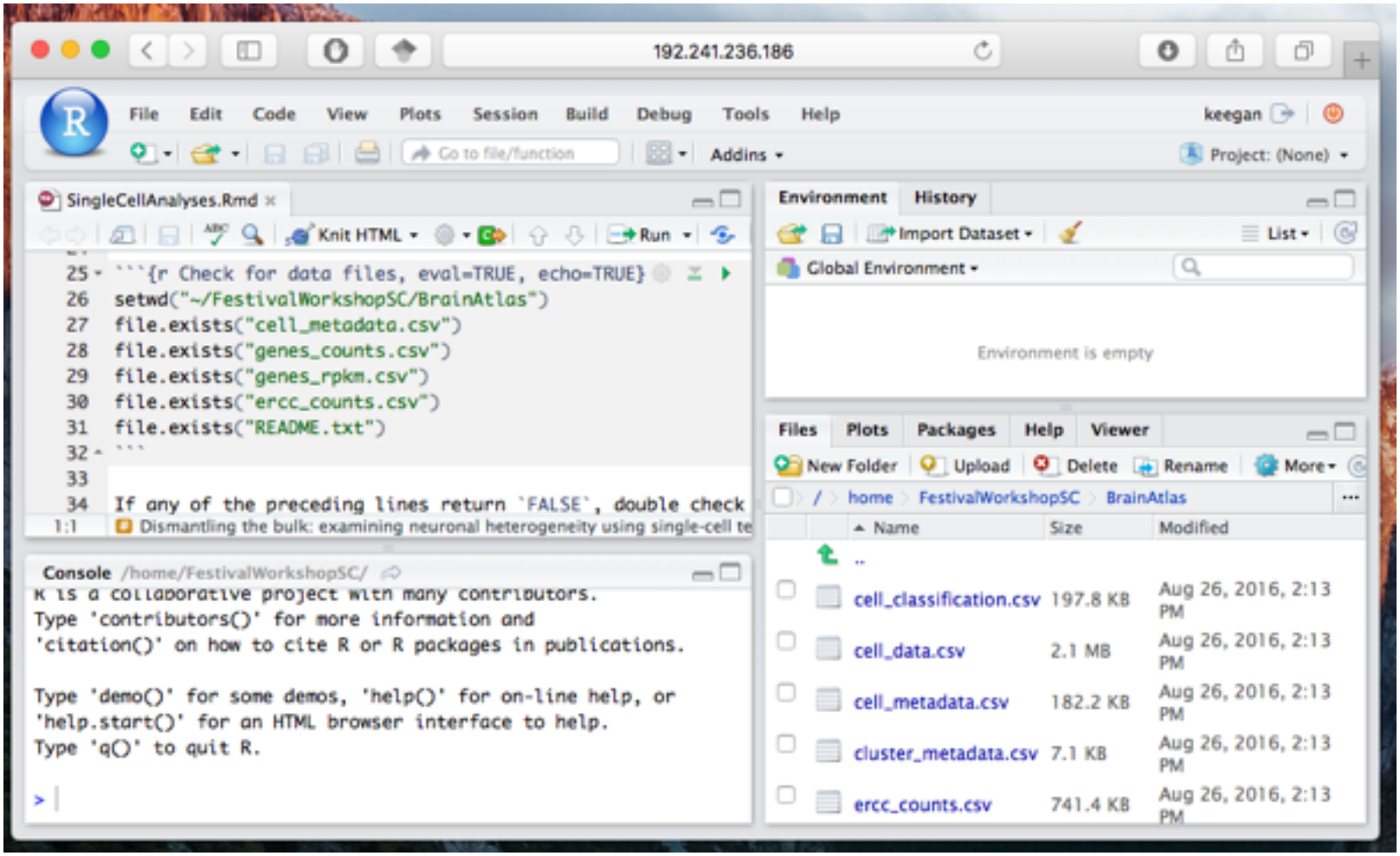
End Result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Addins
Project: (None)
SingleCellAnalyses.Rmd
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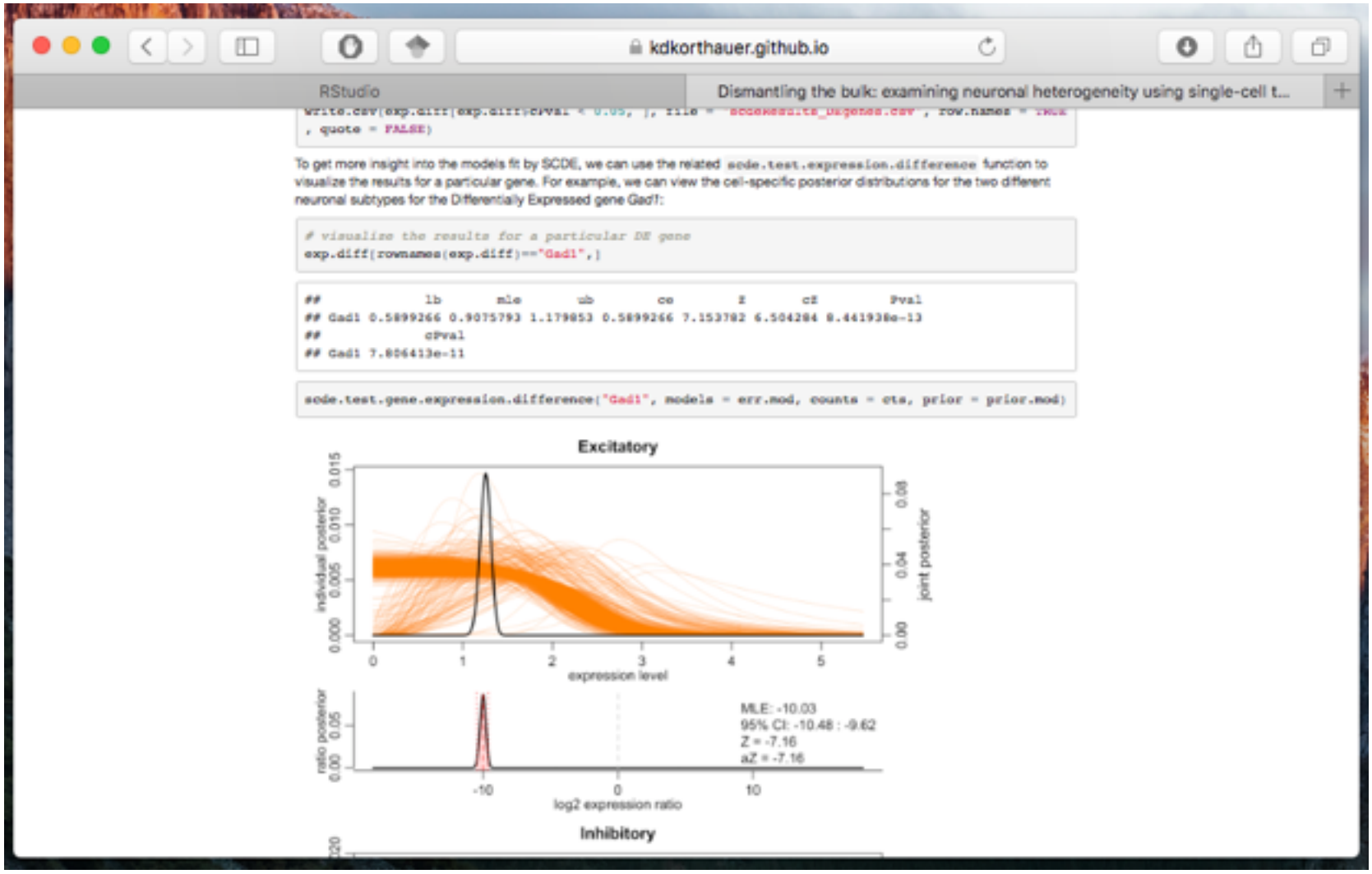
Run
25 ```{r Check for data files, eval=TRUE, echo=TRUE}
26 setwd("~/FestivalWorkshopSC/BrainAtlas")
27 file.exists("cell_metadata.csv")
28 file.exists("genes_counts.csv")
29 file.exists("genes_rpkm.csv")
30 file.exists("ercc_counts.csv")
31 file.exists("README.txt")
32 ```
33
34 If any of the preceding lines return `FALSE`, double check
Dismantling the bulk: examining neuronal heterogeneity using single-cell te
Console /home/FestivalWorkshopSC/
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
>
Environment History
Import Dataset
List
Global Environment
Environment is empty
Files Plots Packages Help Viewer
New Folder Upload Delete Rename More
home FestivalWorkshopSC BrainAtlas
Name Size Modified
cell_classification.csv 197.8 KB Aug 26, 2016, 2:13 PM
cell_data.csv 2.1 MB Aug 26, 2016, 2:13 PM
cell_metadata.csv 182.2 KB Aug 26, 2016, 2:13 PM
cluster_metadata.csv 7.1 KB Aug 26, 2016, 2:13 PM
ercc_counts.csv 741.4 KB Aug 26, 2016, 2:13 PM

End Result



https://kdkorthauer.github.io/FestivalWorkshopVignettes/