EVOLUTIONARY THINKING SESSION 1

AARHUS
UNIVERSITY
BIOINFORMATICS RESEARCH CENTRE (BIRC)

31 JULY 2023

BJARKE MEYER PEDERSEN
PH.D STUDENT

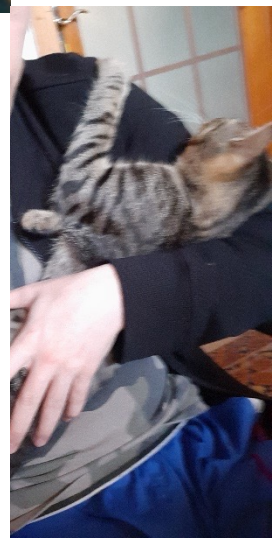
OVERVIEW OF TODAY

- Introduction of ours truly (the TA's)
- Introduction in Assignment Groups
- Introduction of phylogenetic trees
- Pre-test
- Bjarkes Test of Terminology
- Summary

INTRODUCTION TO THE TA'S

Calin Pantea

cpantea@birc.au.dk



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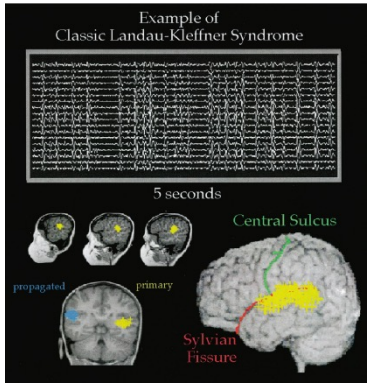

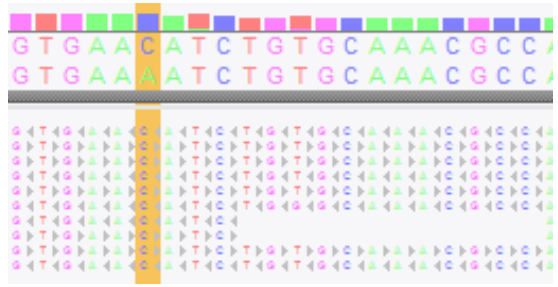

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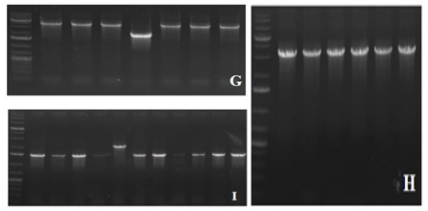


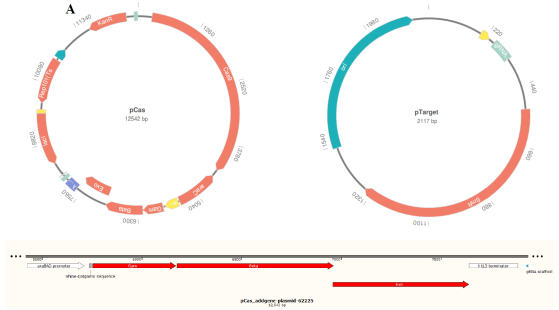
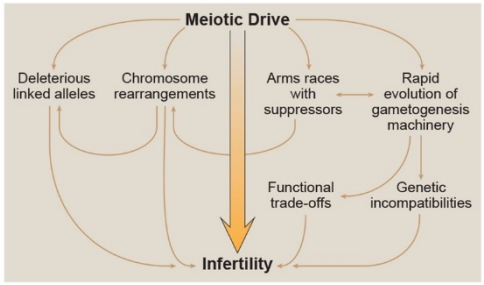
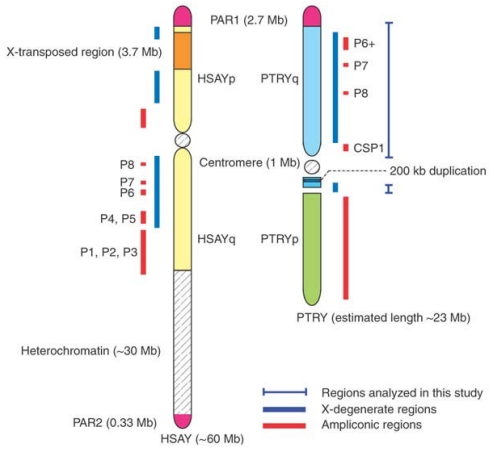
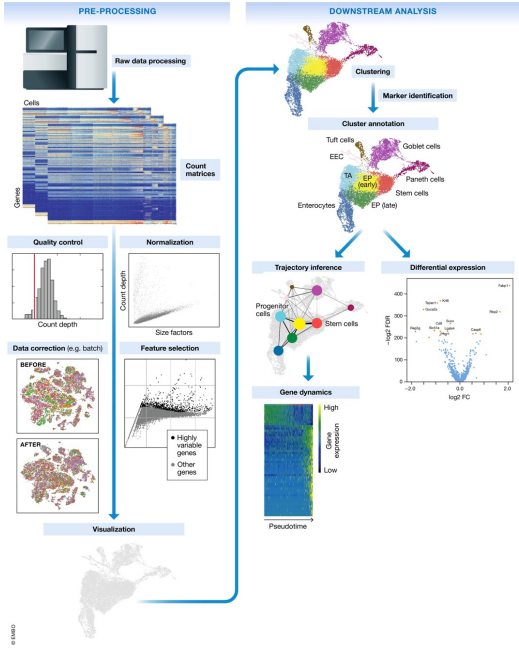


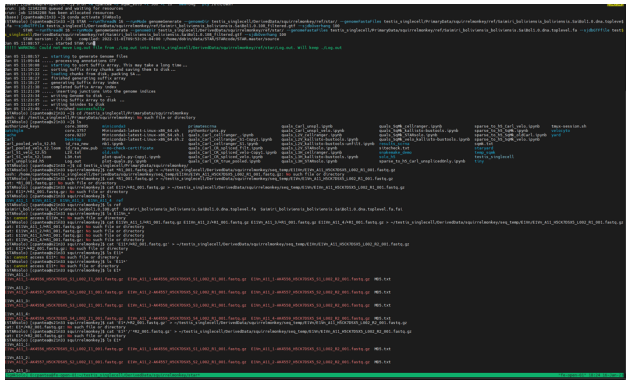
Figure 8. A. Two-plasmid Cas9 editing system; on pCas: Cas9, arabinose-inducible promoter, λ-red recombination system, pTarget-targeting guide sequence + scaffold, IPTG-inducible promoter, origin of replication, kanamycin resistance cassette; on pTarget: Cas9 guide sequence + scaffold, spectinomycin resistance cassette, origin of replication; **B.** pCas λ-red recombination system, close-up

INTRODUCTION TO THE TA'S









```
In [55]: #Perform the test on logarithmized data
         adata.X = adata.layers["raw_counts"] #raw data
         sc.pp.normalize_total(adata) #TPM normalization
         sc.pp.log1p(adata) #Logarithm
         sc.tl.rank_genes_groups(adata, groupby='leiden_R.2', n_genes=50) #Top 50 diff.expressed genes in each cluster
         #sc.tl.rank_genes_groups(adata, groupby='leiden_R.2') #Diff.expressed genes in each cluster
         adata.X = adata.layers['scaled_counts'] #Set again the scaled data as standard data matrix

         WARNING: adata.X seems to be already log-transformed.
         WARNING: Default of the method has been changed to 't-test' from 't-test_overestim_var'

In [56]: result = adata.uns['rank_genes_groups']
         groups = result['names'].dtype.names
         X = pd.DataFrame(
             {group + '_' + key[:1].upper(): result[key][group]
              for group in groups for key in ['names', 'pvals_adj','logfoldchanges']})
         X.head() #print only first five lines
```

Out[56]:

	0_N	0_P	0_L	1_N	1_P	1_L	2_N	2_P	2_L	3_N	…	9_L	10_N	10_P	10_L	1
0	ZFAND3	0.0	1.540654	CNBD1	0.0	2.883742	LOC104004979	0.000000e+00	2.150349	LOC107971397	…	2.196757	ERBB4	0.0	4.341056	ZBTI
1	PPP2R2B	0.0	1.914488	COL25A1	0.0	2.212567	RANBP17	0.000000e+00	1.590523	LOC107966649	…	1.986898	CTNNA2	0.0	3.117980	RBI
2	CCSER1	0.0	1.615984	PDE1C	0.0	2.238655	LOC746200	3.941844e-268	1.772021	EYS	…	2.238107	CARMIL1	0.0	4.068088	Kı
3	FGF14	0.0	1.673132	IQCM	0.0	2.500678	ATRNL1	4.168545e-247	2.240375	LOC472988	…	3.793929	DAPH2	0.0	3.425827	TSI
4	FER	0.0	1.769979	GJB6	0.0	2.333669	SCMH1	8.996916e-253	1.519901	LOC739663	…	2.874110	GPC5	0.0	3.175458	LAI

5 rows × 39 columns

```
In [57]: X[ ['12_N'] ]
```

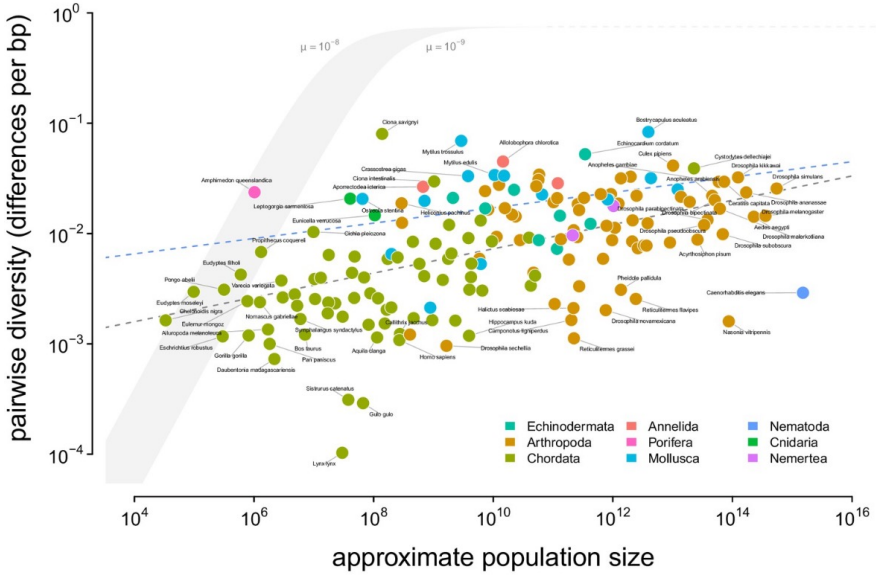
Out[57]:

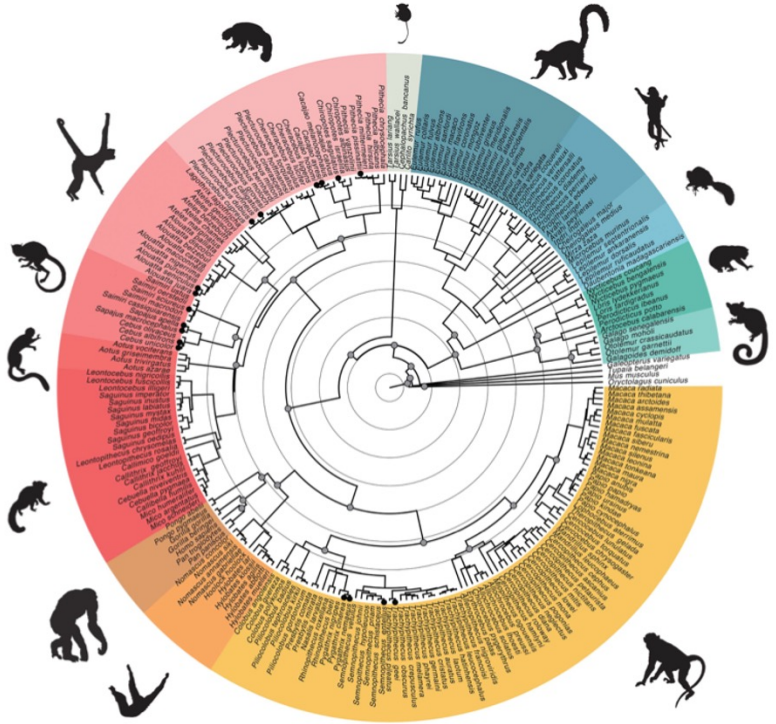
	12_N
0	ERBB4
1	DLGAP1
2	CARMIL1

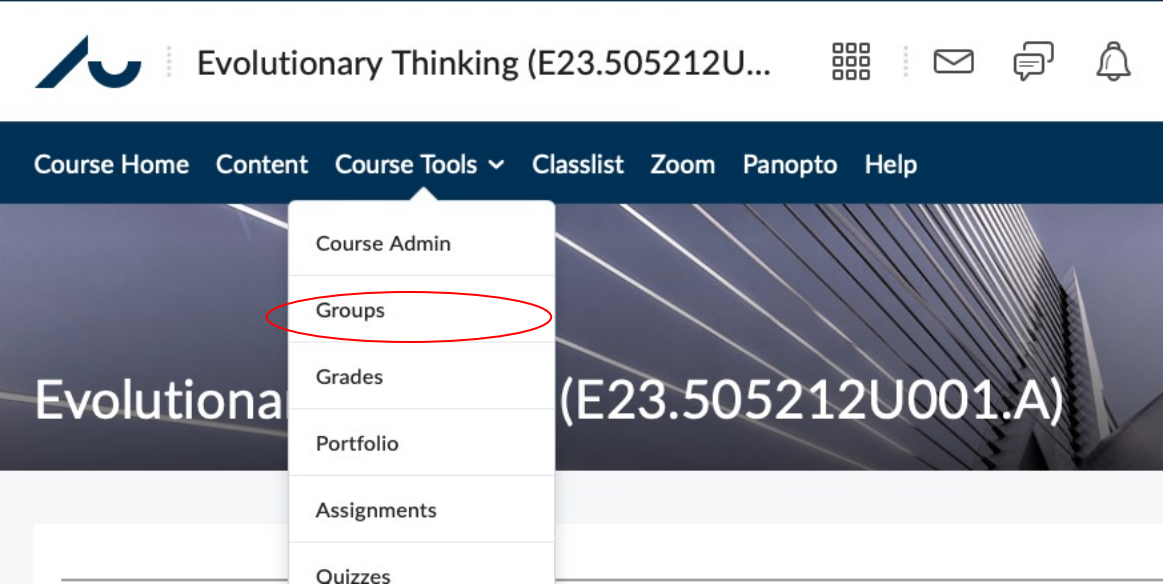
INTRODUCTION TO THE TA'S

Bjarke Meyer Pedersen
Bjarke@birc.au.dk

- 24 y.o.
- B.Sc. in Biology
- Half a masters in Bioinformatics







Group 1

Last Name, First Name, Username, Org Defined ID
Barenys, Felix, au752670, 752670
Jørgensen, Jonas Riber, au683396, 683396
Martensen, René, au684546, 684546
Petersen, Simon, au649982, 649982

Group 2

Last Name, First Name, Username, Org Defined ID
Chatzivasileiou, Savvas, au752684, 752684
Chen, Chongming, au746597, 746597
Kongsgaard, Viktor, au661991, 661991
von Vegesack, Hans Carlo, au752686, 752686

Group 3

Last Name, First Name, Username, Org Defined ID
Dahl, Astrid Klitgaard, au612796, 612796
Grand, Christina Espeseth, au682054, 682054
Hansen, Johanne Gottenborg Høyer, au671624, 671624
Vargas Fichera, Anna Gabriela, au752667, 752667

Group 4

Last Name, First Name, Username, Org Defined ID
Groth, Thorbjørn Sejr, au665701, 665701
Jensen, Ane Naur, au672628, 672628
Sucipto, Abby Kurniawati, au747615, 747615
Wahab, Adam Faraidon, au667387, 667387

Group 5

Last Name, First Name, Username, Org Defined ID
Fledelius, William, au682687, 682687
Saha, Anik, au746885, 746885
Thingholm, Malthe Skovmand, au599620, 599620

Group 6

Last Name, First Name, Username, Org Defined ID
Andersen, Søren Villum Poulsgaard, au635621, 635621
Coto Escofet, Alba, au731539, 731539
Guo, Jiahui, au747088, 747088
Lütken, Gorm Hjorth, au681865, 681865

Group 7

Last Name, First Name, Username, Org Defined ID
Ezekiel, Blessing, au709133, 709133
Grandpierre, Nimród, au752683, 752683
Jensen, Sebastian Kjellerup Godske, au664538, 664538
Jørgensen, Søren, au643843, 643843

Group 8

Last Name, First Name, Username, Org Defined ID
Dam, Peter Konrad Alling, au610627, 610627
Martín Pestaña, David, au752685, 752685
Nikolaidou, Eleni, au752666, 752666
Svenningsen, Laurids, au632957, 632957

Group 9

Last Name, First Name, Username, Org Defined ID
DE SILVA, HENDA HEWA IRESHA MIHIRA., au746824, 746824
Holt, Karl Immanuel, au724387, 724387
Namsaraeva, Altana, au746258, 746258
Skov, Anna Kathrine Jensen, au646861, 646861

Group 10

Last Name, First Name, Username, Org Defined ID
Fur, Laura Marie Hagen, au640803, 640803
Gálfalvy, Nóra, au752687, 752687
Jørgensen, Carolina Ferreira, au590004, 590004
Ulstrup, Johan Christensen, au664823, 664823

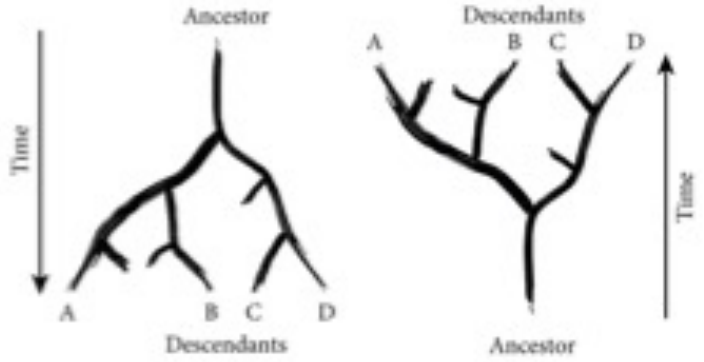
Group 11

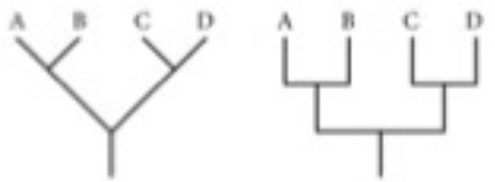
Last Name, First Name, Username, Org Defined ID
Bader, Liliane Zoe, au752655, 752655
Calandra, Elías, au752669, 752669
Charlton, Chester Henry, au747556, 747556
Danger, Stinna Weisberg, au643227, 643227

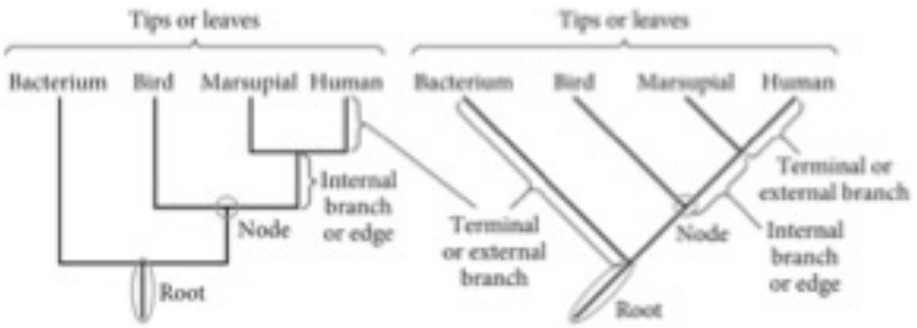
	Week		Presenter 1	Presenter 2	Presenter 3	Topic 1	Topic 2	Topic 3
2	36		group 1	group 2	group 3	Alignment	Jukes Cantor substitution model	Kimura substitution model
3	37		group 4	group 5	group 6	Codon based models	Likelihood ratio test	Syn and nonsyn
4	38		group 7	group 8	group 9	UPGMA,	Neighbourjoining	Parsimony
5	39		group 10	group 11	group 1	Molecular clock	Bootstrapping	Likelihood phylogeny
6	40		group 2	group 3	group 4	Effective population size	Wright Fisher model	Coalescent
7	41		group 5	group 6	group 7	Coalescent with migration	SFS	Fst
	42	Autumn break						
8	43		group 8	group 9	group 10	MK test	HKA test	Tajimas D
9	44		group 11	group 1	group 2	Incomplete lineage sorting	Linkage disequilibrium	Association mapping
10	45		group 3	group 4	group 5	Positive and purifying selection (dn/ds)	Selection versus genetic drift,	Genetic hitch hiking
11	46		group 6	group 7	group 8			
12	47		group 9	group 10	group 11			
13	48							
14	49							

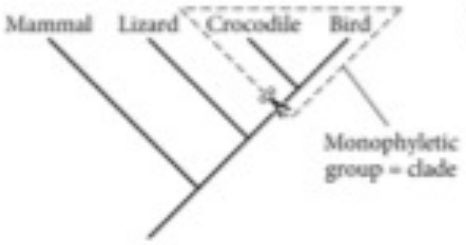
~ 10 OR 15 MIN OF GROUP INTRODUCTIONS

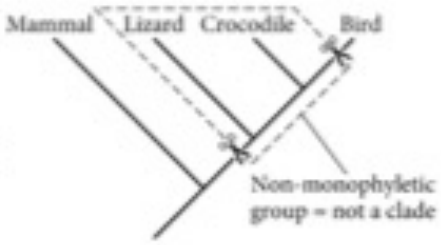
INTRODUCTION TO PHYLOGENETIC TREES











DOWNLOAD MEGA11

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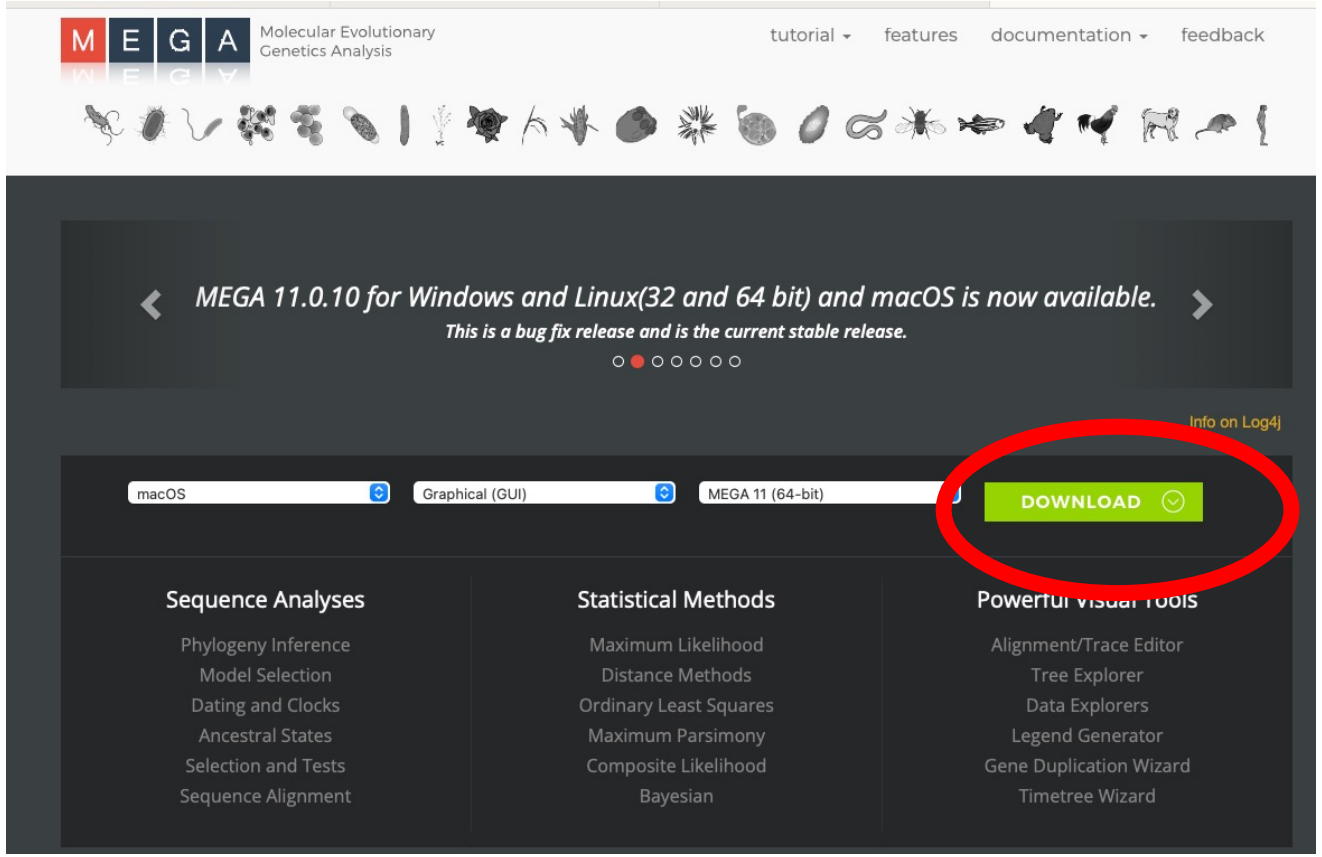

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MENTI AND EVALUATION OF THE FIRST SESSION

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