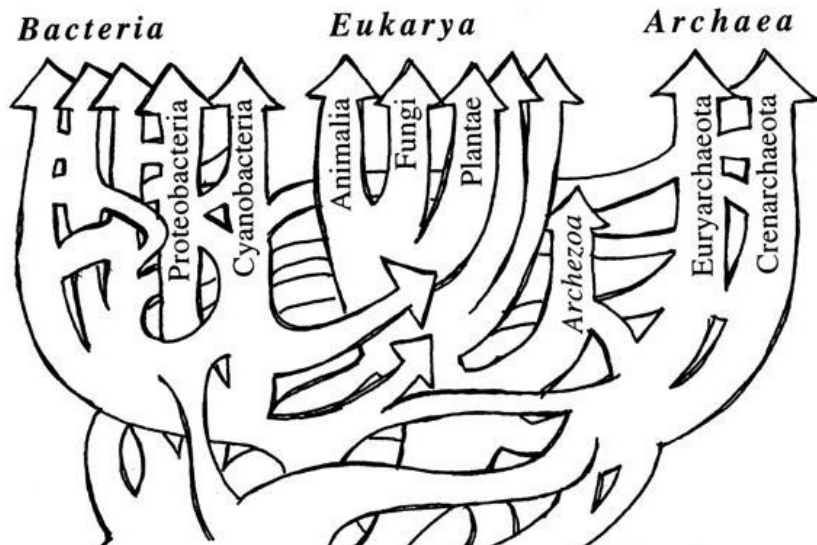


# Digital Lab Journalling with Git

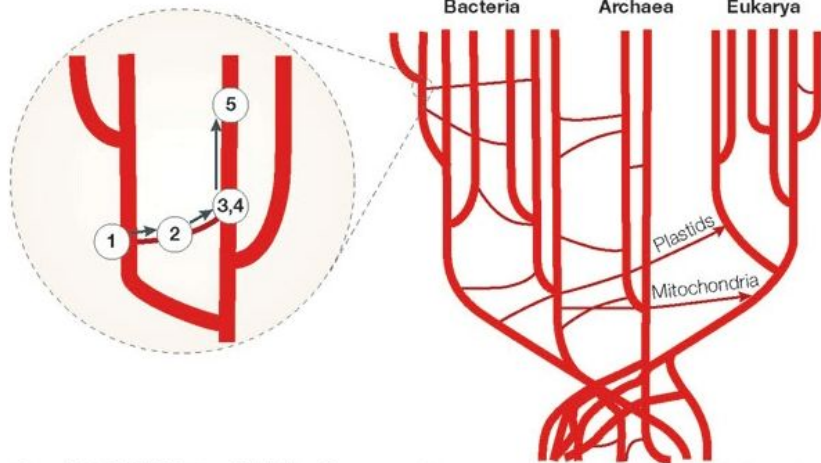
Katrin Leinweber

2015-Apr-13

# Tree of Life



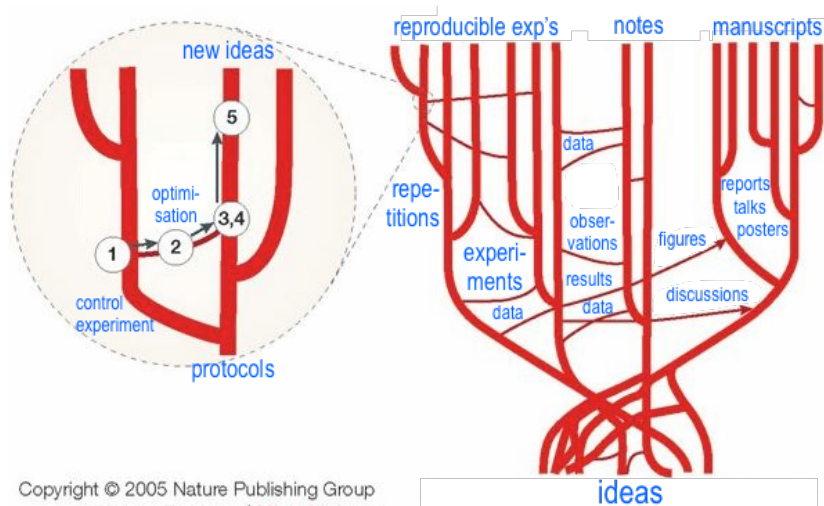
# Tree of Life



Copyright © 2005 Nature Publishing Group  
**Nature Reviews | Microbiology**

Common ancestral community of primitive cells

# Tree of Projects



Copyright © 2005 Nature Publishing Group  
modified **Nature Reviews | Microbiology**

# Git tracks digital evolution of files

- highlights exactly what changed, line by line

proof-read



Katrin Leinweber

158fc2f

12

12

13

- Identification of *\*A. minutissimum\** capsules (asterisks) by subsequent observation of cell clusters by both bright-field and scanning electron microscopy of xenic biofilm (scale bars: 5  $\mu$ m).

13

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14

14

# Git tracks digital evolution of files

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- ▶ makes you comment file changes

proof-read



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14

14

Git is your file watchdog.



# Good against: too many files











	old manuscript versions	29. Mrz. 2015 15:38
106 KB	141218b KL - AchMi SEM - finally ready for PeerJ.odt	18. Dez. 2014
4.727 KB	141218b PJ - AchMi SEM - review.pdf	18. Dez. 2014
29 KB	150216 AchMi SEM rebuttal.docx	18. Feb. 2015
169 KB	150216 KL - AchMi SEM - changes requested by PJ.odt	16. Feb. 2015
202 KB	150216 KL - AchMi SEM - changes requested by PJ.pdf	16. Feb. 2015
104 KB	150216 KL - AchMi SEM - clean requested by PJ.odt	26. Mrz. 2015
4.684 KB	150218 PJ - AchMi SEM - review.pdf	18. Feb. 2015
9.905 KB	150318 KL - AchMi SEM - peerj858-proof.pdf	19. Mrz. 2015
104 KB	150318 KL - AchMi SEM - proofing.odt	18. Mrz. 2015
9.963 KB	150319 PK - AchMi SEM - peerj858-proof.pdf	20. Mrz. 2015
9.912 KB	150320 KL - AchMi SEM - peerj858-proof.pdf	26. Mrz. 2015
104 KB	150326 KL - AchMi SEM - proofed.odt	26. Mrz. 2015
18 KB	AchMi sizes.ods	9. Sep. 2014 1
1.201 KB	Katrina's AchMi SEM Manuskript nicht übernommene Korrekturen beantwortet.pdf	23. Okt. 2014



# Good for: tidy project folders, but...












Katrin > 1209 - Doktor > writing > 140808 - AchMi SEM > fig\_legends

Include in library ▾		Share with ▾		Slide show	Burn	New folder
		Size	Name	Date	Type	
140225 - AchMi biotest						
140330 - 18m summary						
140808 - AchMi SEM						
fig_attachment						
fig_attachment - FigShare						
fig_attachment_old						
fig_ax-fibrils						
fig_capsule-material						
fig_CLEM						
fig_compare						
fig_CV Chl						
fig_EDX						
fig_induced-apical-EPS						
fig_legends						





	Size	Name	Date	Type
	6 KB	F0-legends.md	13. Feb. 2015 10:58	MD File
	3.931 KB	F1-CV-Chl.png	1. Feb. 2015 11:49	IrfanView PNG File
	10.095 KB	F2-CLEM.png	1. Feb. 2015 12:40	IrfanView PNG File
	4.199 KB	F3-compare.png	1. Feb. 2015 11:25	IrfanView PNG File
	1.689 KB	F4-stages.png	5. Feb. 2015 16:59	IrfanView PNG File
	7.618 KB	F5-material.png	2. Feb. 2015 17:27	IrfanView PNG File
	14.593 KB	F6-EDX.png	3. Feb. 2015 11:25	IrfanView PNG File
	73 KB	F7-attachment.png	6. Feb. 2015 15:25	IrfanView PNG File
	2.242 KB	SF1-CLEM-ax.png	9. Feb. 2015 17:22	IrfanView PNG File
	23.513 KB	SF2-ax-fibrils.png	6. Feb. 2015 14:27	IrfanView PNG File

# Good for: ... version history still accessible

## Unsynced changes

	remove meta-info 2 days ago by Katrin Leinweber
	proof-read 16 days ago by Katrin Leinweber
	fixed judgemental "outlier" designati... 26 days ago by Katrin Leinweber
	reverted SF2 scale bar variant 1 month ago by Katrin Leinweber
	Peter's corrections & scale bar varian... 1 month ago by Katrin Leinweber
	moved incubation times to legends 1 month ago by Katrin Leinweber
	150213 PJ requests coherent label siz... 1 month ago by Katrin Leinweber
	renamed 1 month ago by Katrin Leinweber
	initial commit: as in 150211 PJ AchMi... 1 month ago by Katrin Leinweber
	 Added .gitattributes 1 month ago by Katrin Leinweber

## proof-read

	Katrin Leinweber		 Revert  Collapse all
12	12		
13		- Identification of *A. minutissimum* capsules (asterisks) by subsequent observation of cell clusters by both bright-field and scanning electron microscopy of xenic biofilm (scale bars: 5 µm).	
	13	+ Identification of *A. minutissimum* capsules (asterisks) by successive observation of cell clusters by first bright-field and then scanning electron microscopy of xenic biofilm (scale bars: 5 µm).	
14	14		
15	15	**A:** Bright-field micrograph of crystal violet (CV) stained, 31 days old culture. Encapsulated cells (asterisks) are strongly stained, while weak staining indicates few extracellular polymeric substances (EPS) on the frustule surfaces. **B:** Scanning electron micrograph of the the same cell cluster. Encapsulated cells (asterisks) are surrounded by an opaque material. Frustule pores are visible on cells that did not possess a capsule in the hydrated biofilm. Note also the unequal distribution of bacteria ...(line truncated)...	
16	16		
...	...	@@ -30,7 +30,7 @@ Comparison of microstructures on *A. minutissimum* cell surfaces in a xenic biof	
30	30		
31	31		
32	32		
33		- Scanning electron micrographs of terminal parts of *A. minutissimum* cells at potentially different encapsulation stages of xenic biofilms (scale bars: 1 µm).	
	33	+ Scanning electron micrographs of terminal parts of *A. minutissimum* cells at potentially different encapsulation stages within xenic biofilms (scale bars: 1 µm).	
34	34		

# Version control with Git

## Technical

- ▶ works best for line- or paragraph-based files

## Cultural

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- ▶ conflicts only if same lines in same file get changed
- ▶ for text files: better than syncing tools



















# Basic Git vocabulary: repository/repo

- ▶ project folder watched by Git

	.git	5. Okt. 2014 13:42	File folder
	32 KB .RData	13. Mrz. 2015 15:00	RDATA File
	5 KB Figure 7 attachment.pdf	13. Mrz. 2015 14:26	Adobe Acrobat Document
	1 KB Figure 7 basic stats.csv	13. Mrz. 2015 14:26	OpenOffice.org 1.1 Tabelle
	1 KB fig_attachment.Rproj	13. Mrz. 2015 14:00	R Project
	655 KB Figure_7_attachment_documentation.html	17. Feb. 2015 09:42	Firefox HTML Document
	15 KB Figure_7_attachment_documentation.docx	17. Feb. 2015 09:42	Microsoft Word-Dokument
	155 KB Figure_7_attachment_documentation.pdf	17. Feb. 2015 09:24	Adobe Acrobat Document
	4 KB Figure 7 attachment documentation.Rmd	17. Feb. 2015 08:45	RMD File
	9 KB Figure 7 attachment.eps	9. Feb. 2015 17:13	IrfanView EPS File
	1 KB 141005a_fig_attachment - basic stats - 11d.csv	8. Feb. 2015 17:20	OpenOffice.org 1.1 Tabelle
	1 KB 141005a_fig_attachment - basic stats - 20d.csv	8. Feb. 2015 17:20	OpenOffice.org 1.1 Tabelle
	1 KB 141005a_fig_attachment - basic stats - 31d.csv	8. Feb. 2015 17:20	OpenOffice.org 1.1 Tabelle
	1 KB 141005a_fig_attachment - basic stats.csv	8. Feb. 2015 17:20	OpenOffice.org 1.1 Tabelle
	74 KB Figure 7 attachment 31d.png	6. Feb. 2015 15:25	IrfanView PNG File
	84 KB Figure 7 attachment.png	6. Feb. 2015 15:25	IrfanView PNG File
	66 KB Figure 7 attachment 11d.png	6. Feb. 2015 15:25	IrfanView PNG File
	72 KB Figure 7 attachment 20d.png	6. Feb. 2015 15:25	IrfanView PNG File



















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	15 KB Figure_7_attachment_documentation.docx	17. Feb. 2015 09:42	Microsoft Word-Dokument
	155 KB Figure_7_attachment_documentation.pdf	17. Feb. 2015 09:24	Adobe Acrobat Document
	4 KB Figure 7 attachment documentation.Rmd	17. Feb. 2015 08:45	RMD File
	9 KB Figure 7 attachment.eps	9. Feb. 2015 17:13	IrfanView EPS File
	1 KB 141005a_fig_attachment - basic stats - 11d.csv	8. Feb. 2015 17:20	OpenOffice.org 1.1 Tabelle
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	1 KB 141005a_fig_attachment - basic stats - 31d.csv	8. Feb. 2015 17:20	OpenOffice.org 1.1 Tabelle
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	74 KB Figure 7 attachment 31d.png	6. Feb. 2015 15:25	IrfanView PNG File
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# Basic Git vocabulary: repository/repo

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- ▶ is still a normal folder: add, edit & delete files normally
- ▶ database of file versions in hidden subfolder

	.git	5. Okt. 2014 13:42	File folder
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- ▶ **commit history:** self-explanatory & verifiable documentation
- ▶ DEMO: `fig_legends > initial`

## Basic Git vocabulary: .gitignore

- ▶ file that contains a repo's rules for ignoring files



## Basic Git vocabulary: .gitignore

- ▶ file that contains a repo's rules for ignoring files
- ▶ No preview of highlighted changes? Large file?  
Auto-generated? Rather ignore those!



## Basic Git vocabulary: .gitignore



- ▶ file that contains a repo's rules for ignoring files
- ▶ No preview of highlighted changes? Large file?  
Auto-generated? Rather ignore those!
- ▶ DEMO: 30m summary > ignore all \*.docx & Git it on  
> unignore \*.pdf



~~.gitignore~~ ~~ignore~~  
**To be, or not to be**  
**That is the question**

# Basic Git vocabulary: .gitignore in GitHub for Windows

proof-read

 Katrin Leinweber  158fc2f

▼ F0-legends.md

...	...	@@ -10,7 +10,7 @@ Micrograp and is a merge of the chlor
10	10	
11	11	
12	12	
13		- Identification of <i>A. minutissimum</i> capsules (asterisks) by subsequent observation of cell clusters by both bright-field and scanning electron microscopy of xenic biofilm (scale bars: 5 $\mu$ m).
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Repository settings...

Open in Explorer

Open in Git Shell

View on GitHub

Undo most recent commit

Options...

About GitHub for Windows...

# Vocabulary summary

## repository/repo

- ▶ project folder watched by Git, plus hidden database of file versions

## committing

- ▶ composing logical set of file changes and meaningful commit message

## .gitignore

- ▶ a repo's ignore rules for non-essential files & file types

# How to start using Git?

1. download client from [windows.github.com](https://windows.github.com) (any other from [git-scm.com/downloads/guis](https://git-scm.com/downloads/guis)) & install

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4. **recommended:** start writing texts in Markdown<sup>1</sup> format
5. **optional (for collaboration etc.):** create account with Git hosting service like GitLab<sup>2</sup> or wait for [git.uni.kn](https://git.uni.kn)

---

<sup>1</sup>Possible in Word with Writage add-in

<sup>2</sup>GitHub wants \$ for private repos, but client is free & compatible with other Git services

# Thanks to & Further Reading

## Writing with Git

- ▶ “Markdown Basics” and “Mastering Markdown” by GitHub
- ▶ “Scientific Markdown” by Jens Erat
- ▶ “Paper Now” by PeerJ

## Git in Science

- ▶ “Git/GitHub: a Primer for Researchers” by Carly Strasser
- ▶ “We Need a Github of Science” by Marcio von Muhlen
- ▶ “Git for Scientists” by Molly Gibson

## Git concepts & tech

- ▶ “Learn Version Control with Git” by Fournova
- ▶ “10 Years of Git: An Interview with Git Creator Linus Torvalds” by Jennifer Cloer

Thanks for your attention! Questions?

