UGene – Open-Source Cross Platform Bioinformatics Software

Introduction

- UGene allows interactive visualization and manipulation of common bioinformatics file formats
- Reference: https://academic.oup.com/bioinformatics/article/28/8/1166/195474
- User manual: <u>http://ugene.net/downloads/UniproUGENE_UserManual.pdf</u>
- Download link: <u>http://ugene.net/download.html</u>

Home Screen

000			UGENE	
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Welcome to UG	ENE			
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	• 2	Õ		Recent projects No opened projects
	Run or Create Workflow	Quick Start Guide		

Cite UGENE: "Unipro UGENE: a unified bioinformatics toolkit" Okonechnikov; Golosova; Fursov; the UGENE team Bioinformatics 2012 28: 1166-1167 2: Tasks 2: 12g

Multiple Sequence Alignment View

	Sequence Reading Options
The document selected contai	ns multiple sequence instances.
Please select the way UGENE w	vIII read these sequences:
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O Join sequence	es into alignment and open in multiple alignment viewer
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 Shows up when opening FASTA file with multiple sequences for the first time



Multiple alignment viewer image of aligned sequences

Adding New Files To View

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Files can be added from the right click • menu

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- Added files are not automatically aligned if not already prealigned
- UGene allows alignment of sequences in current project using one of multiple algorithms
- WARNING: alignment of large sequences takes prohibitively long time on slower machines

Highlighting Options

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- ٠ can be set as reference.
- A selected sequence in an alignment Sites in other sequences that are identical to or different from reference can be highlighted, as well as specific mutation types, gaps or conservation level

No highlight

http://www.inscidence/actionscience/action/action/ hCoV-19/Turkey/GLAB-CoV013/2020|EPI_ISL_428368|2020-04-16 hCoV-19/Turkey/HSGM-8992/2020|EPI_ISL_429865|2020-03-18 hCoV-19/Turkey/HSGM-5516/2020\EPI_ISL_428713\2020-03-18 hCoV-19/Turkey/HSGM-5769/2020|EPI_ISL_428717|2020-03-19 hCoV-19/Turkev/HSGM-7718/2020|EPI_15L_428719|2020-03-21 hCoV-19/Turkey/HSGM-4706/2020\EPI_ISL_428712\2020-03-17 hCoV-19/Turkey/ERAGEM-001/2020|EPI_ISL_424366|2020-03-17 hCoV-19/Turkey/HSGM-10241/2020 [EPI_ISL_429871] 2020-03-23 hCoV-19/Turkey/HSGM-5602/2020\EPI_ISL_428714\2020-03-18 hCoV-19/Turkev/HSGM-8001/2020\EPI_ISL_428720\2020-03-21 hCoV-19/Turkey/HSGM-5624/2020|EPI_ISL_428715|2020-03-18 hCoV-19/Turkey/H5GM-8968/2020|EPI_ISL_429861|2020-03-22 hCoV-19/Turkev/H5GM-8010/2020|EPI_ISL_428722|2020-03-22 hCoV-19/Turkey/GLAB-CoV008/20201EPI_ISL_42739112020-04-13 hCoV-19/Turkev/HSGM-4505/2020\EPI ISL 429867\2020-03-17 hCoV-19/Turkey/HSGM-4236/2020\EPI_ISL_429866\2020-03-16 hCoV-19/Turkey/HSGM-4701/2020\EPI_ISL_429869\2020-03-17 hCoV-19/Turkey/HSGM-11518/2020|EPI_ISL_429872|2020-03-25 hCoV-19/Turkey/HSGM-4598/2020\EPI_ISL_429868\2020-03-17 hCoV-19/Turkev/HSGM-8990/20201EPE ISL 42987012020-03-22 hCoV-19/Turkey/HSGM-8979/2020|EPT_ISL_429864|2020-03-22 hCoV-19/Turkey/HSGM-8920/20201EPI_JSL_42985212020-03-22 NC 045512.2 Wuhan seafood market pneumonia virus isolate Wu hCoV-19/Turkey/HSGM-5770/2020|EPT_ISL_428718|2020-03-19 hCoV-19/Turkey/GLAB-CoV012/2020[EPI_ISL_428346]2020-04-17 hCoV-19/Turkey/HSGM-8003/2020|EPI_15L_428721|2020-03-21 hCoV-19/Turkey/HSGM-11520/2020 EPI_ISL_429873 2020-03-23 hCoV-19/Turkey/HSGM-5711/2020|EPI_ISL_428716|2020-03-18 hCoV-19/Turkey/H5GM-8975/2020[EPI_I5L_429863]2020-03-22



Highlighted disagreements

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Extracting Highlighted Sequences

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The highlighted sites can be exported in tab-delimited text file

- The resulting file can be viewed in Microsoft Excel, Pages, or similar software
- The first column shows nucleotide position, the second column shows reference sequence, the remaining columns show non-aligned sites
- Gaps are shown with –, while sites identical to reference are shown with.

Manually Editing Sequences

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🔹 👘 👔 3: Log 🔋 Running task: Run ClustalD al	Igrement task Tasks: 1 🖉 🗋	Sequence	es can be ed	ited manually using the

- Low quality sequences can cause misalignment as ٠ unidentified residues (N in nucleotide, X in peptide) align preferentially with each other
- 5 right click menu
- ٠ Individual sites or long stretches can be edited

Erroneous gaps

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hCoV-19/Turkey/GLAB-CoV013/2020 EPI_ISL_428368 2020-04-16	NNNNN	NNNNN	NNNNN	NNNNN	NNNNN														
hCoV-19/Turkey/HSGM-8992/2020\EPI_ISL_429865\2020-03-18	A A A A A	A A A A A A		AAAAA	A A A A A														
hCoV-19/Turkev/HSGM-5516/2020\EPI_ISL_428713\2020-03-18					A A A A A											;			
hCoV-19/Turkey/HSGM-5769/2020 EPI_ISL_428717 2020-03-19	A A A A A	A A A A A A	A A A A A	AAAAA	A A A A A														
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hCoV-19/Turkey/HSGM-4706/2020\EPI_ISL_428712\2020-03-17					A A A A A											;			
hCoV-19/Turkey/ERAGEM-001/2020 EPI_ISL_424366 2020-03-17	NNNNN	NNNNN	NNNNN	NNNNN	NNNNN														
hCoV-19/Turkey/HSGM-10241/2020 EPI_ISL_429871 2020-03-23																			
hCoV-19/Turkey/HSGM-5602/2020\EPI_ISL_428714\2020-03-18		A A A A A A																	
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hCoV-19/Turkey/HSGM-5624/2020 EPI_ISL_428715 2020-03-18	A A A A A			A A A A A	A A A A A														
hCoV-19/Turkey/H5GM-8968/2020\EPI_15L_429861\2020-03-22		A A A A A A																	
hCoV-19/Turkey/HSGM-8010/2020\EPI_ISL_428722\2020-03-22					A A A A A											;			
hCoV-19/Turkey/GLAB-CoV008/2020 EPI_ISI_427391 2020-04-13					A A A A A														
hCoV-19/Turkey/HSGM-4505/2020\EPI_1SL_429867\2020-03-17					AANNN														
hCoV-19/Turkey/HSGM-4236/2020\EPI_1SL_429866\2020-03-16		A A A A A A		AAAAA	A A A A A														
hCoV-19/Turkev/HSGM-4701/2020\EPI_ISL_429869\2020-03-17	A A A A A			AAAAA															
hCoV-19/Turkey/HSGM-11518/2020 EPI_ISL_429872 2020-03-25	A A A A A	A A A A A A	A A A A A	AAAAA	A A A A A														
hCoV-19/Turkey/HSGM-4598/2020\EPI_15L_429868\2020-03-17	A A A A A	A A A A A A		A A A A A	A A A A A														
hCoV-19/Turkey/HSGM-8990/2020\EPI_ISL_429870\2020-03-22					A A A A A											;	;		
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hCoV-19/Turkey/HSGM-8970/2020\EPI_15L_429862\2020-03-22	A A A A A			A A A A A															
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hCoV-19/Turkev/HSGM-5770/2020\EPI_ISL_428718\2020-03-19			A A A A A		A A A A A														
hCoV-19/Turkey/GLAB-CoV012/2020 EPI_ISL_428346 2020-04-17	NNNNN	NNNNN	NNNNN	NNNNN	NNNNN														
hCoV-19/Turkey/HSGM-8003/2020\EPI_15L_428721\2020-03-21	NNNNN	NNNNN	NNNNN	NNNNN	NNNNN														
hCoV-19/Turkey/HSGM-11520/2020 EPI_ISL_429873 2020-03-23	NNNNN	NNNNN	NNNNN	NNNNN	NNNNN														
hCoV-19/Turkey/HSGM-5711/2020 EPI_ISL_428716 2020-03-18	NNNNN	NNNNN	NNNNN	NNNNN	NNNNN														
hCoV-19/Turkey/HSGM-8975/2020\EPI_ISL_429863\2020-03-22	NNNNN	NNNNN	NNNNN	NNNN	NNNNN														