

Vidjil: an open-source platform for interactive repertoire analysis

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VidjilNet consortium, Inria

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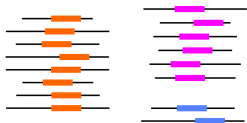
Vidjil

High-throughput Repertoire Sequencing (RepSeq) analysis

Web Application

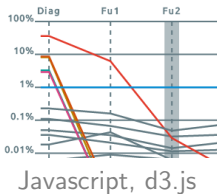
Patient database
Server

Vidjil-algo

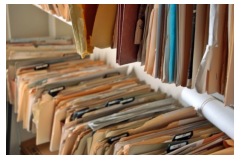


C++

Client



Javascript, d3.js



Python, web2py,
AJAX

- ▶ code on <http://gitlab.vidjil.org/>
- ▶ open-source (GPL v3), public issue tracker (Gitlab)
- ▶ continuous integration, > 3,000 unit and functional tests

Duez et al., PLoS One, 2016



Patient database and server

Autonomous RepSeq analysis pipeline in a clinical/research lab



Patient database and server

Autonomous RepSeq analysis pipeline in a clinical/research lab



Upload

upload list

L1413893.fasta



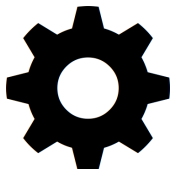


Patient database and server

Autonomous RepSeq analysis pipeline in a clinical/research lab



Upload



Process

upload list
L1413893.fasta

last processing	status
2015-02-09	RUNNING

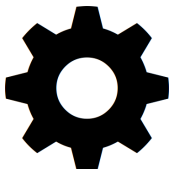


Patient database and server

Autonomous RepSeq analysis pipeline in a clinical/research lab



Upload



Process



Analyze

upload list
L1413893.fasta

last processing	status
2015-02-09	RUNNING

see the result:

[multi](#)

Classify and filter your data with **tags**

search

name	birth	info
Austeen Jane (43)	1775-12-16	#T-ALL #diagnosis #cr Winchester hospital
de Cervantes Miguel (42)	1547-09-29	#relapse #pre-SCT #post-SCT
von Schiller Friedrich (41)	1759-01-01	#B-ALL #FR1 blood sample, 10µM primer
Alighieri Dante (40)	1265-01-01	#B-ALL #diagnosis #relapse #KDE
Sand Geroge (39)	1804-02-01	#WM
Goethe Johann Wolfgang (38)	1749-08-28	#T-ALL
Bilderdijk Willem (37)	1756-09-07	
خلدون ابن (36)	1332-05-27	#T-ALL #diagnosis 60% blasts
Němcová Božena (35)	1820-02-04	#T-ALL
Aarestrup Emil (34)	1800-12-04	
Držić Marin (33)	1508-01-01	#CLL 98.4%
Brenner Sophia Elisabet (32)	1659-04-29	#diagnosis #B-ALL #BCR-ABL
Alecsandri Vasile (31)	1801-07-21	#B-ALL #IKAROS
Σολωμός Διονύσιος (30)	1798-04-08	#T-ALL #diagnosis #pre-SCT
Collett Camilla (29)	1813-01-23	
Wilkońska Paulina (28)	1815-01-01	#CLL
Espanca Florbela (27)	1894-12-08	#T-ALL 70% blasts
老子 Laozi (26)		

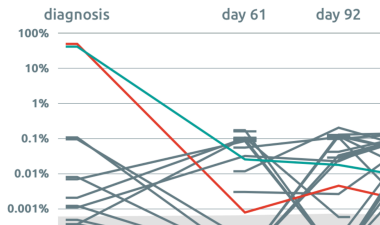
Classify and filter your data with **tags**

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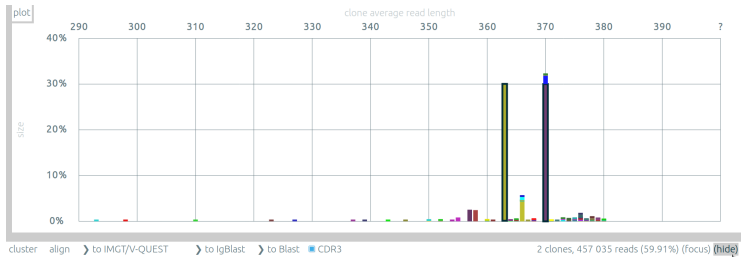
merge align > to IMGT/V-QUEST > to IgBlast > to Blast

4 clones, 738 494 reads (90.53%)

× TRGV3 1/11/2 J1	49.30%	★ i	GCCACCTGGGACAGCTCCC-TT-GTTC--ATTATAAGAAACTCTTTGGCAGTG
× TRGV3 4/1/2 J1	41.23%	★ i	GCCACCTGGG--A--T--A--T--T--ATTATAAGAAACTCTTTGGCAGTG
× TRGV3 3/16/3 J1	0.0021%	★ i	GCCG-CTTGGG-ACCCCAATTTGGTACGGGTTATAAGAAACTCTTTGGCAGTG
× TRGV3 5/4/2 J1	+	★ i	GCCACCTGGG---GC--CA-A-T--T--A-TA--AGAAACTCTTTGGCAGTG

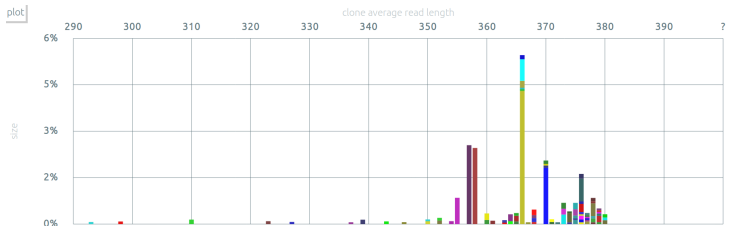
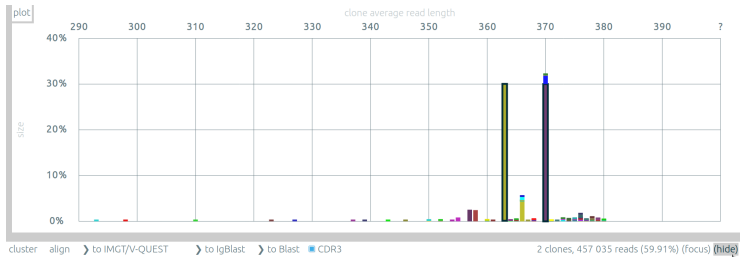
Browsing and filtering clones

Hide dominant clones to study other clones



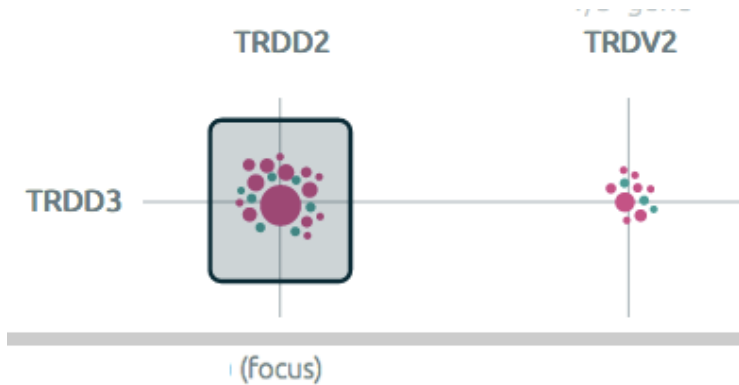
Browsing and filtering clones

Hide dominant clones to study other clones



Browsing and filtering clones

Focus on any subset of clones



Further inspect the sequences with other software

IMGT/V-QUEST

Integrate informations
from V-QUEST
(% of identity,
productivity, ...)

IgBlast

Blast

cluster align > to IMGT/V-QUEST ▼ > to IgBlast > to Blast CDR3-IMGT V/D/J-IMGT

× IGHV3-9 7/CCCGGA/17 J6*02

10.59%

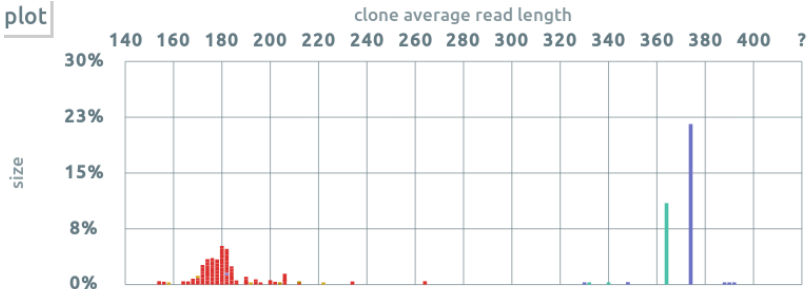
97.80%



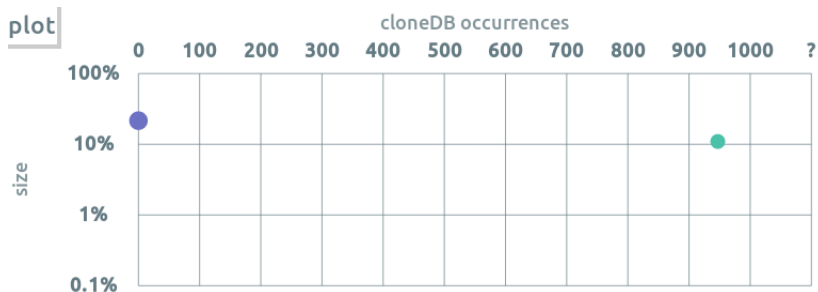
ATTGCTGTGCA|CCGGAGGTA

CloneDB: do my clonotypes occur in other samples?

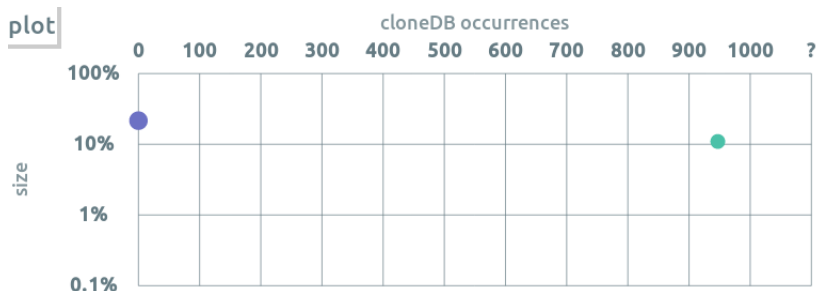
plot



CloneDB: do my clonotypes occur in other samples?



CloneDB: do my clonotypes occur in other samples?



██████████ (32694) (multi+inc+xxx)	49 clones (3.038%)
██████████ (32584) (multi+inc+xxx)	20 clones (0.355%)
<u>Lib80_LAL</u> (multi+inc+xxx)	20 clones (0.355%)
<u>Lib47_LAL</u> (multi+inc+xxx)	1 clone (0.418%)
██████████ (32352) (multi+inc+xxx)	1 clone (0.418%)
██████████ (32009) (multi+inc+xxx)	2 clones (0.557%)
██████████ (32852) (multi+inc+xxx)	2 clones (0.211%)
<u>Lib46_LAL</u> (multi+inc+xxx)	1 clone (0.284%)
██████████ (32620) (multi+inc+xxx)	2 clones (0.341%)
<u>Lib82_LAL</u> (multi+inc+xxx)	2 clones (0.341%)
██████████ (32259) (multi+inc+xxx)	5 clones (0.140%)
██████████ (32204) (multi+inc+xxx)	3 clones (0.126%)
██████████ (32217) (multi+inc+xxx)	4 clones (0.659%)
██████████ (32112) (multi+inc+xxx)	2 clones (0.295%)
██████████ (32841) (multi+inc+xxx)	1 clone (0.314%)

30,000

samples, since 2016

6,000

ALL/CLL patients at diagnosis in 7 hospitals, since 2016

> 50 regular users in > 30 hospital or research labs

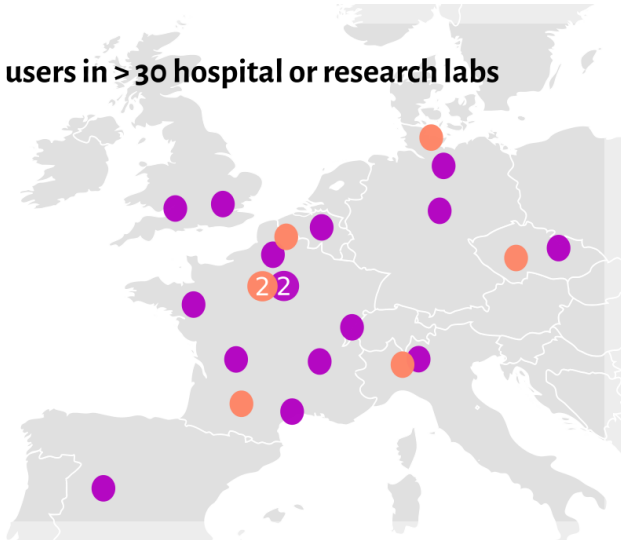
Canada ●

US ●●

Brasil ●

Japan ●●

South Korea ●



Vidjil: interactive analysis of immune repertoire

vidjil.org



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