

# TOWARDS A GO ANNOTATION TOOL

CURATION ACCELERATOR SOFTWARE

# FLYBASE LITERATURE CURATORS

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- Read papers
- Extract information for FlyBase
- Per paper, genes mentioned: per gene, any alleles: new constructs, phenotypes, controls

# ANNOTATION WITH GENE ONTOLOGIES

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- How can we make this easy? or farm it out to The Community (wikipedia model)

# ABOUT GENE ONTOLOGY - GO -ANNOTATION

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- Each gene should have up to 3 GO terms associated with it, describing
  - molecular function
  - biological process
  - cellular component
- Common to GMOD databases: each GO term has a standard definition designed to have the same biological meaning across the entire living world, ie for all disciplines, any organism.
- GO ontology terms designed to standardise the biology

EBI > Databases > QuickGO

Home Help Downloads + Your selection (0 terms)

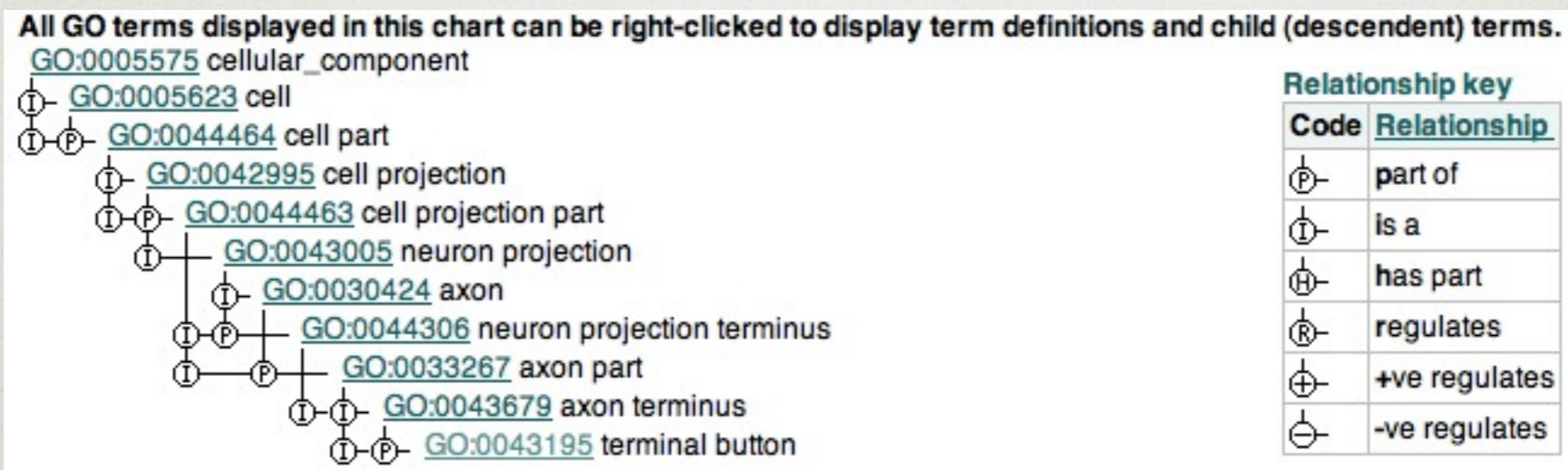
Search

Search: thickening

GO (35)

	ID	Name	
Process	GO:0052386	cell wall thickening	
Process	GO:0021991	neural plate thickening	
Process	GO:0052482	defense response by cell wall thickening	
Process	GO:0052105	induction by symbiont of defense-related host cell wall thickening	
Process	GO:0052161	modulation by symbiont of defense-related host cell wall thickening	
Process	GO:0052394	induction by organism of defense-related symbiont cell wall thickening	Obsolete
Process	GO:0052446	modulation by organism of defense-related symbiont cell wall thickening	Obsolete
Process	GO:0052539	positive regulation by symbiont of defense-related host cell wall thickening	
Process	GO:0052540	positive regulation by organism of defense-related symbiont cell wall thickening	Obsolete
Process	GO:0052290	induction by organism of defense-related cell wall thickening in other organism involved in symbiotic interaction	
Process	GO:0052300	modulation by organism of defense-related cell wall thickening in other organism involved in symbiotic interaction	
Process	GO:0052538	positive regulation by organism of defense-related cell wall thickening in other organism involved in symbiotic interaction	
Process	GO:0075048	cell wall strengthening in symbiont involved in entry into host	Synonym
Component	GO:0043679	axon terminus	Definition
Component	GO:0043195	terminal button	Definition
Process	GO:0043049	otic placode formation	Definition
Component	GO:0061174	type I terminal button	Definition
Process	GO:0060790	tooth placode formation	Definition
Component	GO:0061175	type II terminal button	Definition
Process	GO:0021501	prechordal plate formation	Definition
Process	GO:0030910	olfactory placode formation	Definition

<b>ID</b>	GO:0043195
<b>Name</b>	terminal button
<b>Ontology</b>	Cellular Component
<b>Definition</b>	Terminal inflated portion of the axon, containing the specialized apparatus necessary to release neurotransmitters. The axon terminus is considered to be the whole region of thickening and the terminal button is a specialized region of it.
<b>Comment</b>	
<b>Secondary IDs</b>	



# 17 COLUMNS

Columns:	DB	ID	Alt	Symbol	Taxon	Qualifier	GO ID	GO Term name	Reference	Ev	With	A	Date	From
<b>1</b> Filter:	Any	Any			Any	Any	GO:0043195		Any	Any	Any			Any
Advanced search	<input type="text"/>													
<b>2</b> Statistics:		403			15		1			4				6
<b>3</b> View	1-25 <a href="#">bookmark</a> this annotation set													
	UniProtKB	A0A761		ct-2	9823		GO:0043195	terminal button	Compara	IEA	ENSMUSP00000032907	C	20100904	ENSEMBL
	UniProtKB	A2AFG5		L1cam	10090		GO:0043195	terminal button	PMID:16537644	IDA		C	20060512	MGI
	UniProtKB	A2AFG6		L1cam	10090		GO:0043195	terminal button	PMID:16537644	IDA		C	20060512	MGI
	UniProtKB	A2AFG7		L1cam	10090		GO:0043195	terminal button	PMID:16537644	IDA		C	20060512	MGI
	UniProtKB	A2AFG8		L1cam	10090		GO:0043195	terminal button	PMID:16537644	IDA		C	20060512	MGI
	UniProtKB	A2VCP3		P2rx7	10090		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000001746	C	20100904	ENSEMBL
	UniProtKB	A3KMF0		Grik2	10090		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000000415	C	20100904	ENSEMBL
	UniProtKB	A3KMF1		Grik2	10090		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000000415	C	20100904	ENSEMBL
	UniProtKB	A3KN68		Ptpn2	10090		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000006942	C	20100904	ENSEMBL
	UniProtKB	A4LB49		DRD4	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000024137	C	20100904	ENSEMBL
	UniProtKB	A4LB56		DRD4	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000024137	C	20100904	ENSEMBL
	UniProtKB	A5JHE0		Kcnma1	10090		GO:0043195	terminal button	PMID:15328414	IDA		C	20080813	MGI
	UniProtKB	A6H8K8		GRIK4	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000047794	C	20100904	ENSEMBL
	UniProtKB	A6P3C6		KCNMA1	9796		GO:0043195	terminal button	Compara	IEA	ENSMUSP00000065293	C	20100904	ENSEMBL
	UniProtKB	A8JNM4		Ank2	7227		GO:0043195	terminal button	PMID:18439405	IDA		C	20100401	FlyBase
	UniProtKB	A8JNM5		Ank2	7227		GO:0043195	terminal button	PMID:18439405	IDA		C	20100401	FlyBase
	UniProtKB	A8JNM6		Ank2	7227		GO:0043195	terminal button	PMID:18439405	IDA		C	20100401	FlyBase
	UniProtKB	A8JNM7		Ank2	7227		GO:0043195	terminal button	PMID:18439405	IDA		C	20100401	FlyBase
	UniProtKB	A8JR42		gukh	7227		GO:0043195	terminal button	PMID:11937021	IDA		C	20070523	FlyBase
	UniProtKB	A8K0H7		A8K0H7	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000000415	C	20100904	ENSEMBL
	UniProtKB	A8K139		A8K139	9606		GO:0043195	terminal button	Compara	IEA	ENSMUSP00000099935	C	20100904	ENSEMBL
	UniProtKB	A8K2Z0		A8K2Z0	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000001746	C	20100904	ENSEMBL
	UniProtKB	A8K7F0		A8K7F0	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000000415	C	20100904	ENSEMBL
	UniProtKB	A8KAF4		A8KAF4	9606		GO:0043195	terminal button	Compara	IEA	ENSRNOP00000026350	C	20100904	ENSEMBL

# GO ANNOTATION

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- Common problem: S.pombe, Zfin, Dictybase, WormBase, Protein2GO, GO consortium
- Changing format for GO annotation lines (16, 17)
- Production of GO lines in standard EDIT format eg for FlyBase
- or in standard GO format required for data input to the GO consortium database (FB submits periodically)



# THE GO CURATION TOOLS

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- Usually perl (java) front end. All directly input to database
- Web-based
- Combined ontology exploration tools - trees, graphical views, definitions - previously created ontology lines.
- (FB does not have one) FB curators **edit** text files.
- FB: curation process is **independent** of database parsing.  
Highly Recommended
- Database can be developed without reference to the curation interface
- Exploit this to design beautifully engineered GUI based tools

# STRATEGY

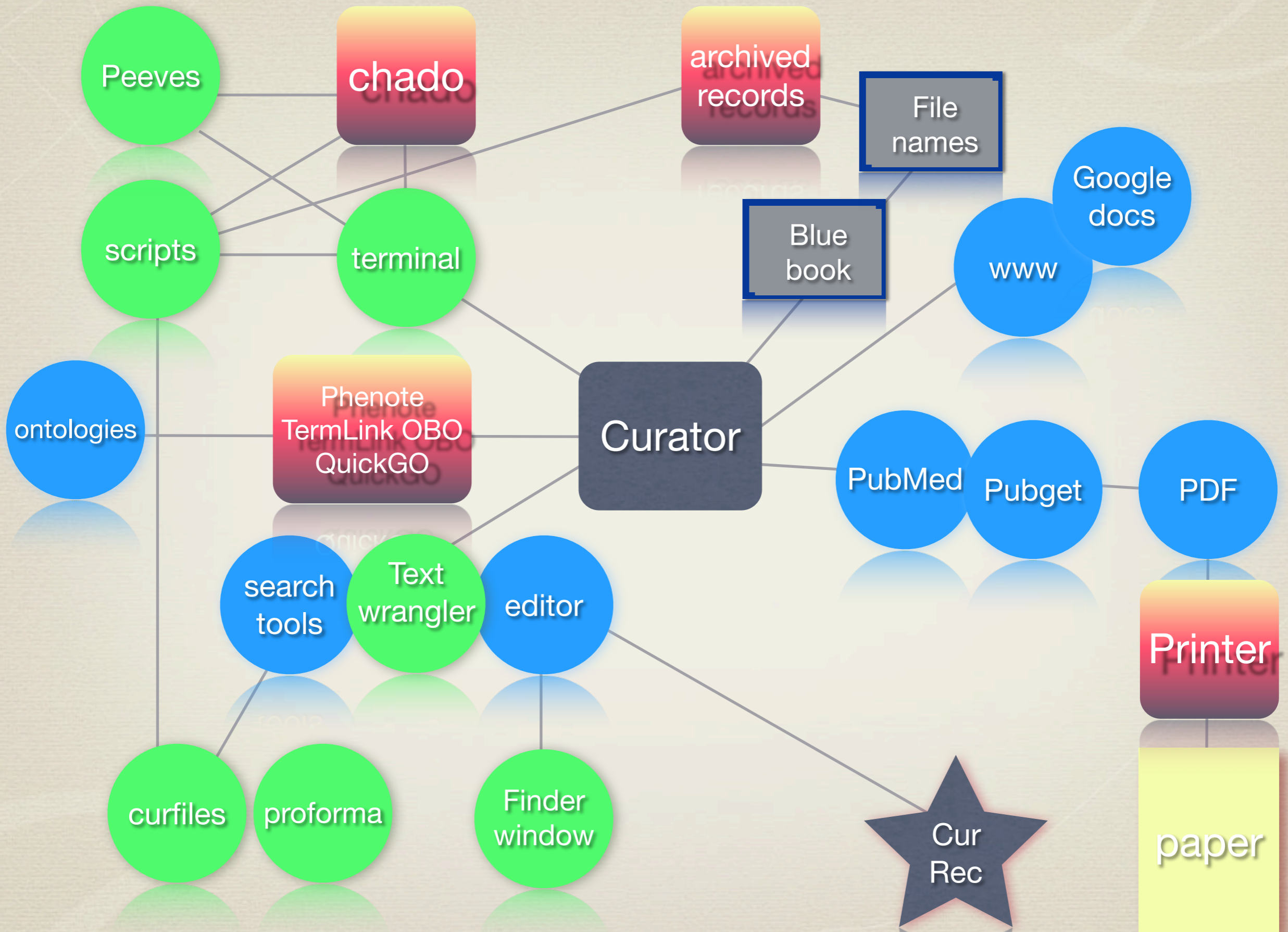
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- **User designed GUI (speed + accuracy)**
- **Modular design of GO editor with xml config**
- **OOP with API for different GMODs**
- **Proof of concept: desktop GO tool to speed up curation > XML config > API for general use**
- **Translate to web service**

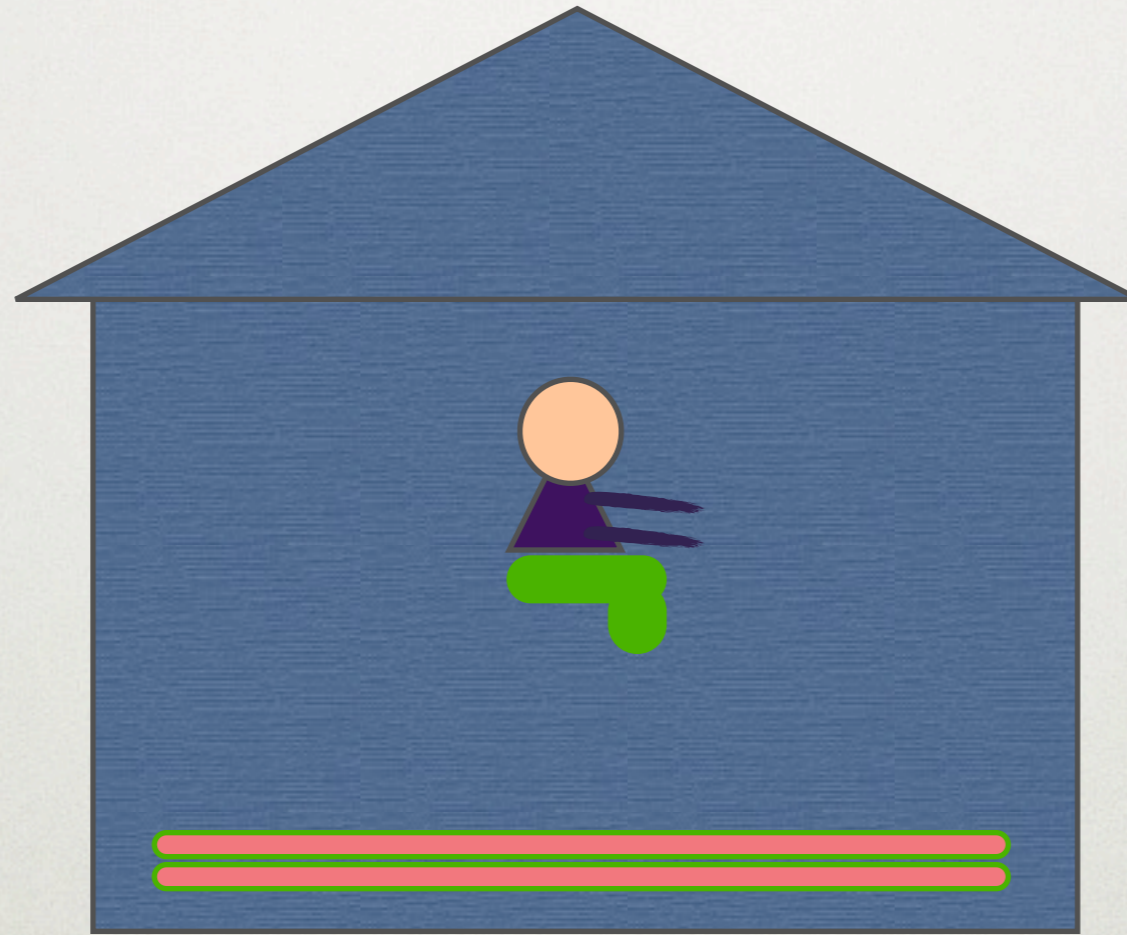
# PROGRAMMING

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- Java - OOP - GUI - JSP / Tomcat
- Our tool focus on reducing mouse-work, tool switches, 'manual' editing and textual errors
- One window, many tools



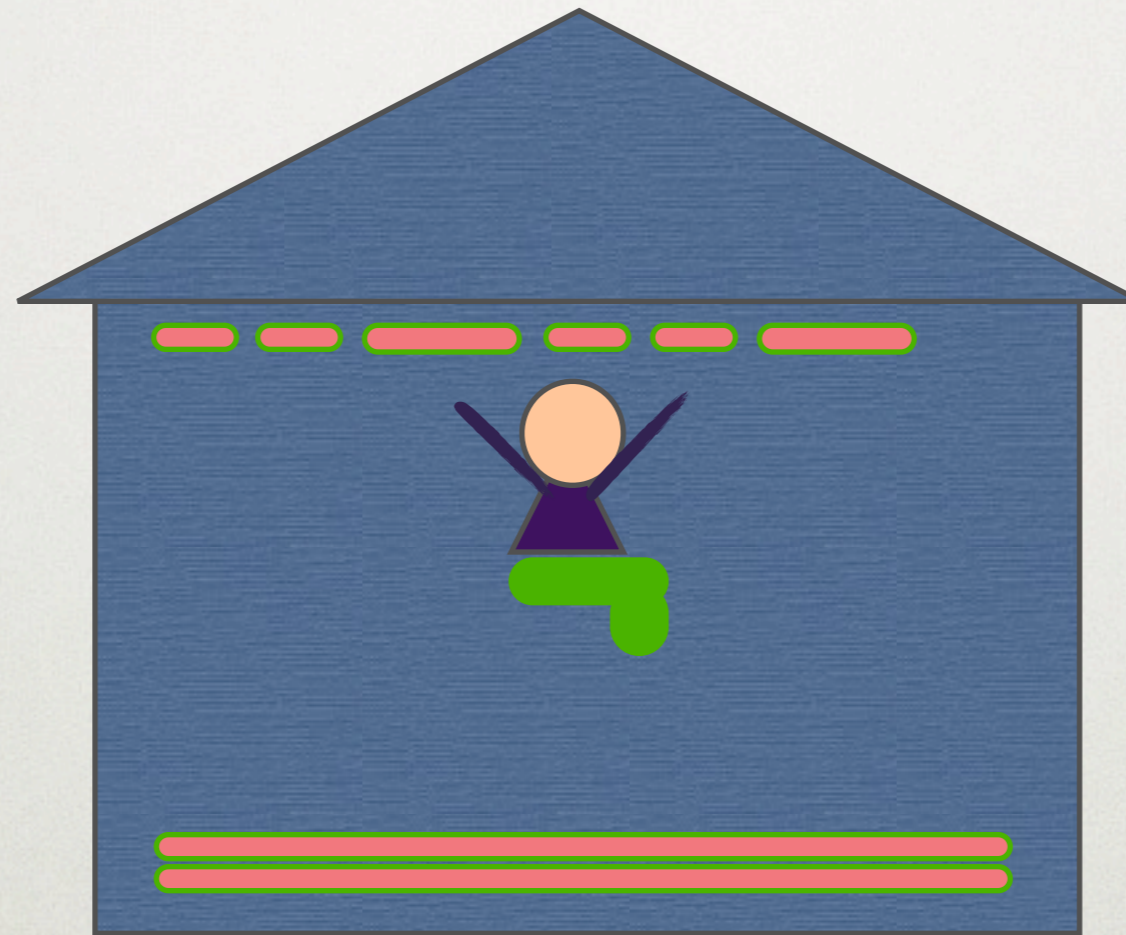
# GO TOOL



Software houses GO lines  
Clever editor .. makes GO lines

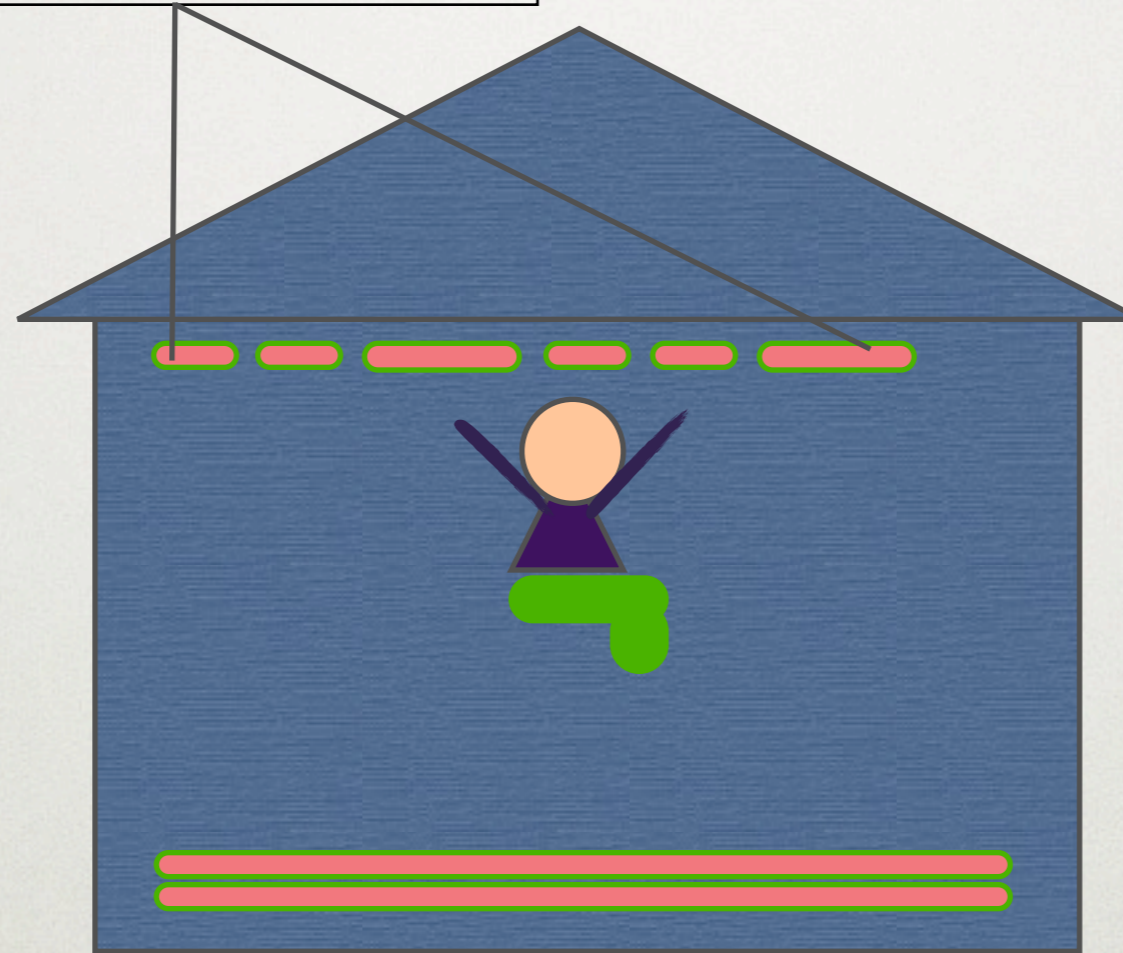
# GO TOOL

---



Config XML  
describes which  
components to use

For each component,  
source file  
database ids

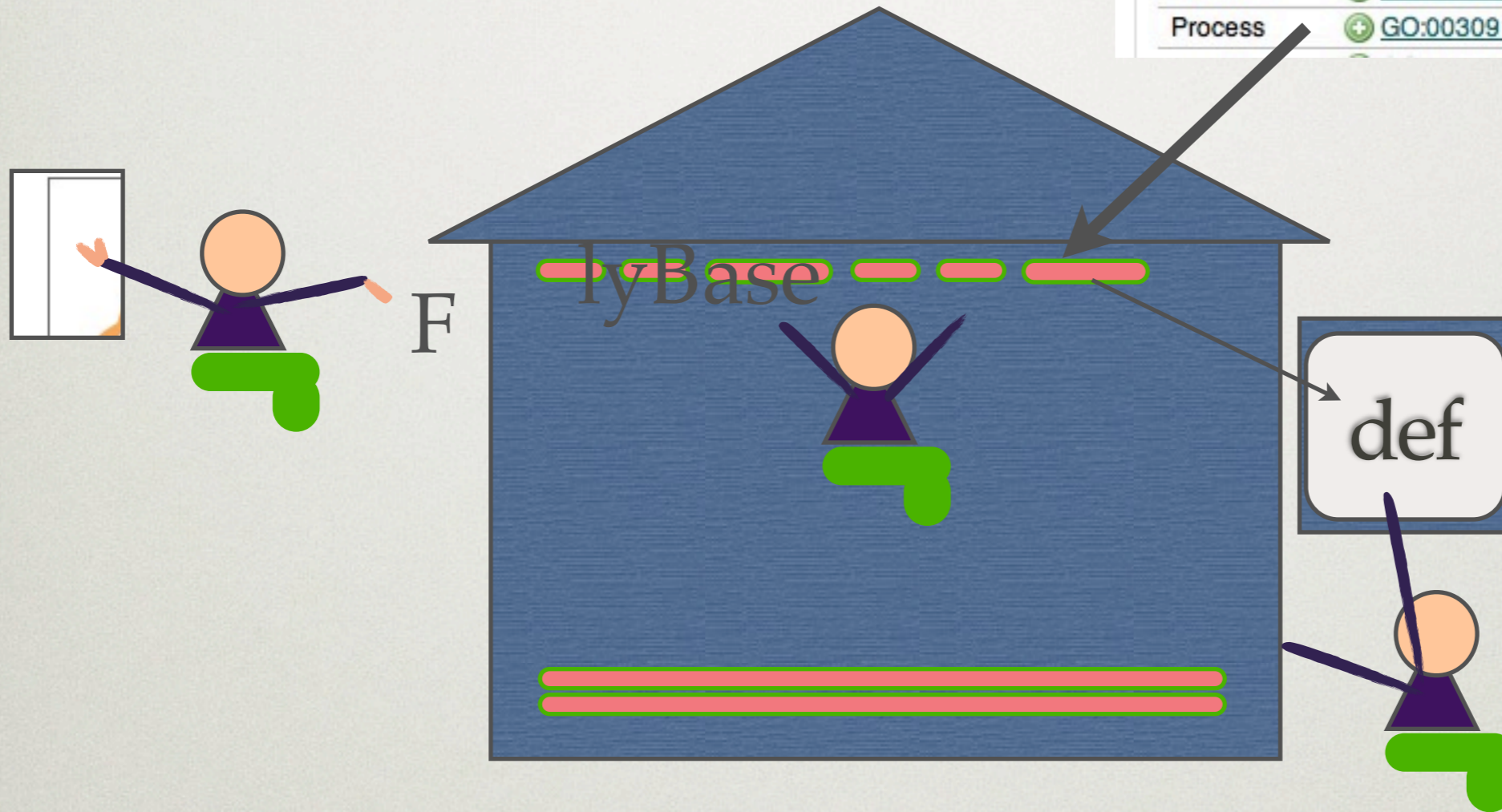


API  
Type of component  
with display text

source file parsing  
database queries  
output formats

# CLEVER ED

Process	+ GO:0052539	positive regulation by symbiont of de
Process	+ GO:0052540	positive regulation by organism of de
Process	+ GO:0052290	induction by organism of defense-rel
Process	+ GO:0052300	modulation by organism of defense-r
Process	+ GO:0052538	positive regulation by organism of de
Process	+ GO:0075048	cell wall strengthening in symbiont in
Component	+ GO:0043679	axon terminus
Component	+ GO:0043195	terminal button
Process	+ GO:0043049	otic placode formation
Component	+ GO:0061174	type I terminal button
Process	+ GO:0060790	tooth placode formation
Component	+ GO:0061175	type II terminal button
Process	+ GO:0021501	prechordal plate formation
Process	+ GO:0030910	olfactory placode formation





# GO TOOL +

Untitled

TimeStamp MacOS GO-line

Save Copy Save Clear

Curation record Provenance Qualifier GO search your search Evidence Code With/From

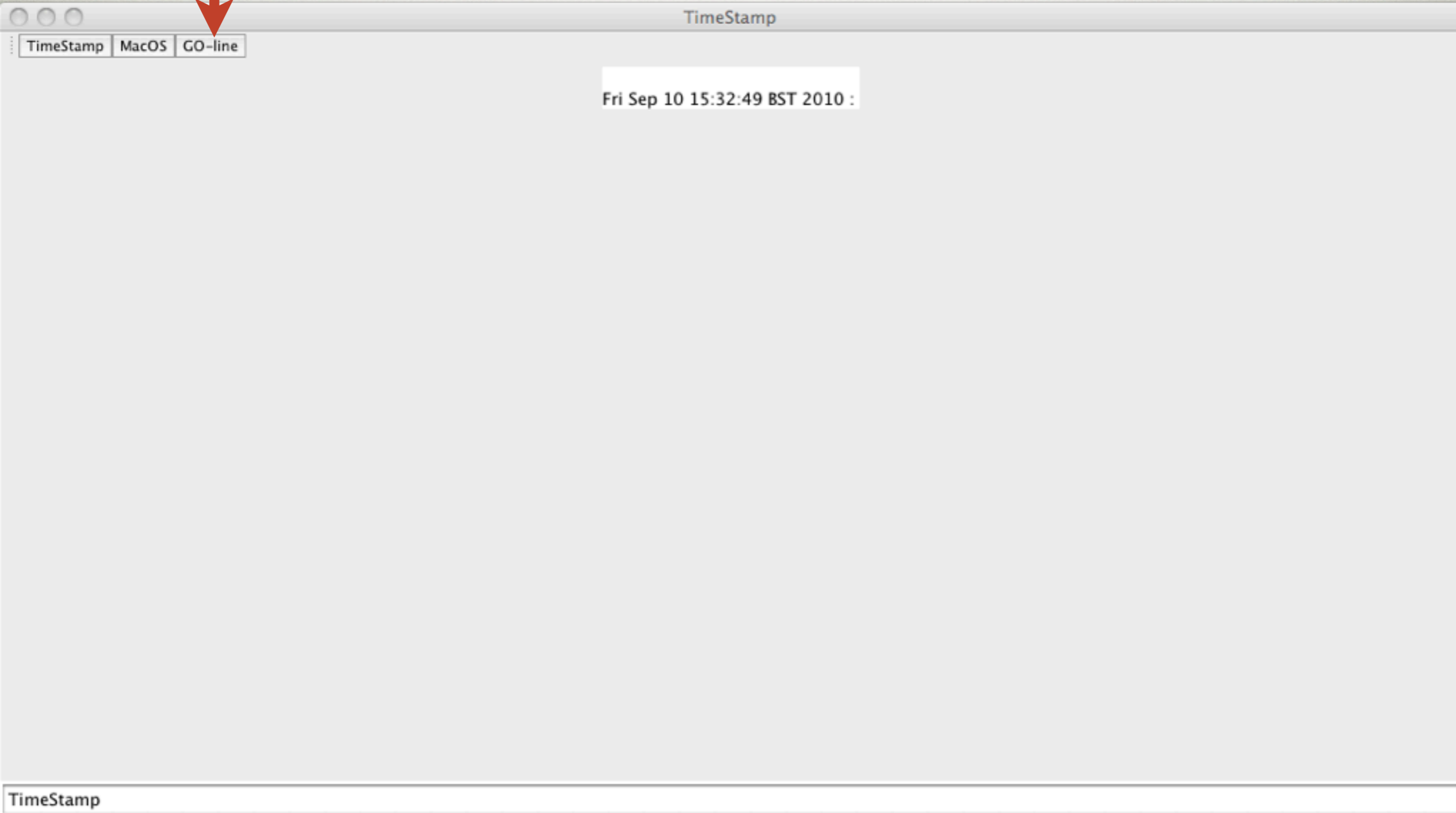
?? ?? ?? ?? ?? ?? ??

Curation Record

Additional GO Reference Records Clear additional records

Hello hif22. Ready.

# OTHER TOOLS



# TAB & TYPE

The screenshot shows the 'GO-line' application window. At the top, there are three tabs: 'TimeStamp', 'MacOS', and 'GO-line'. Below the tabs is a search bar and three buttons: 'Save Copy', 'Save', and 'Clear'. The main interface features a row of dropdown menus for 'Curation record', 'Provenance', 'Qualifier', and 'GO search', each with '??' as a placeholder. To the right of these are three more dropdowns labeled 'your search', 'Evidence Code', and 'With/From', also with '??' placeholders, followed by a '+' button. Below this row is a 'Curation Record' button. At the bottom of the interface, there are two buttons: 'Additional GO Reference Records' and 'Clear additional records'. The bottom status bar reads 'GO line editor'.

# GO EDITOR

The screenshot shows the GO Editor web interface. At the top, the title "GO EDITOR" is displayed in large black letters. Below it, a red double-headed arrow points from the title to the "TimeStamp" dropdown menu in the top-left corner of the interface. Another red arrow points from the title to the "Provenance" dropdown menu, which is currently set to "lyBaseFB".

The interface includes a header bar with the text "GO-line" and a search bar containing "FlyBaseFB:?? | ?? ??". To the right of the search bar are buttons for "Save Copy", "Save", and "Clear". Below the search bar is a row of dropdown menus for "Curation record" (set to "??" and containing a small downward arrow), "Provenance" (set to "lyBaseFB" and containing a small downward arrow), "Qualifier" (set to "??" and containing a small downward arrow), and "GO search" (set to "??" and containing a small downward arrow). To the right of these dropdowns are input fields for "your search", "Evidence Code" (set to "??" and containing a small downward arrow), and "With/From" (set to "??" and containing a small downward arrow). A "+" button is located to the right of the "With/From" field.

Below the dropdowns is a "Curation Record" button. At the bottom of the interface, there are two buttons: "Additional GO Reference Records" and "Clear additional records". The main content area is a large empty white space. At the very bottom, a footer bar contains the text "GO line editor".

# GO EDITOR

The screenshot shows the GO Editor web application interface. At the top, the title "GO EDITOR" is displayed in large black letters. A red arrow points from the "GO" part of this title to the "Qualifier" dropdown menu in the search section of the application. The application window has a title bar that says "GO-line". Below the title bar, there are three tabs: "TimeStamp", "MacOS", and "GO-line". The main content area contains a search form with the following fields and controls:

- A text input field containing "FlyBaseFB: | ?? ??".
- Buttons for "Save Copy", "Save", and "Clear".
- A search section with the following labels and controls:
  - "Curation record": A dropdown menu with "??".
  - "Provenance": A dropdown menu with "lyBaseFB".
  - "Qualifier": A dropdown menu with a red arrow pointing to it.
  - "GO search": A text input field with "??".
  - "your search": A dropdown menu with "??".
  - "Evidence Code": A dropdown menu with "??".
  - "With/From": A dropdown menu with "??".
  - A "+" button to the right of the "With/From" dropdown.
- A "Curation Record" button below the search section.
- A section with two buttons: "Additional GO Reference Records" and "Clear additional records".
- A large empty white area for displaying results.

At the bottom left of the window, the text "GO line editor" is visible.

# GO EDITOR



GO-line

TimeStamp MacOS GO-line

FlyBaseFB: | ?? ??

Save Copy Save Clear

Curation record Provenance Qualifier GO search your search Evidence Code With/From

?? lyBaseFB ??

+

Curation Record

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: kaempferol 3-O-galactosyltransferase activity ; GO:0033834 ?? ??

Save Copy Save Clear

Curation record Provenance Qualifier GO search k Evidence Code With/From

?? lyBaseFB kaempferol 3-O-galactosyltransferase activity ; GO:0033834 ?? ??

Curation Record

kaempferol 3-O-galactosyltransferase activity

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

The screenshot shows the GO Editor interface. At the top, there are three window control buttons (red, yellow, green) and a title bar with the text "GO-line". Below the title bar, there are three tabs: "TimeStamp", "MacOS", and "GO-line". The main content area contains a text input field with the text "FlyBaseFB: keratan sulfate biosynthetic process ; GO:0018146 | ?? ??". To the right of this field are three buttons: "Save Copy", "Save", and "Clear". Below the text field is a table with the following columns: "Curation record", "Provenance", "Qualifier", "GO search", "ke", "Evidence Code", and "With/From". The "GO search" column contains the text "keratan sulfate biosynthetic process ; GO:0018146". Below the table is a "Curation Record" button. At the bottom of the interface, there are two buttons: "Additional GO Reference Records" and "Clear additional records". The bottom status bar contains the text "GO line editor". A red arrow points from the "GO EDITOR" text to the "GO search" field in the table.

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: keratan sulfate biosynthetic process ; GO:0018146 | ?? ?? Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	ke	Evidence Code	With/From
??	lyBaseFB		keratan sulfate biosynthetic process ; GO:0018146		??	??

Curation Record

keratan sulfate biosynthetic process

Additional GO Reference Records Clear additional records

GO line editor



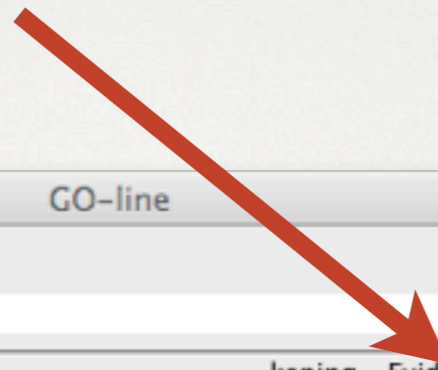
# GO EDITOR

The screenshot shows the GO Editor web application interface. At the top, the title "GO EDITOR" is displayed in large black letters. A red arrow points from this title to the "GO search" field in the form below. The form is titled "GO-line" and contains several fields and buttons:

- Timestamp**: MacOS GO-line
- GO line input**: FlyBaseFB: cell wall thickening ; GO:0052386 | ?? ??
- Buttons**: Save Copy, Save, Clear
- Form Fields**:
  - Curation record**: ??
  - Provenance**: FlyBaseFB
  - Qualifier**: (empty)
  - GO search**: cell wall thickening ; GO:0052386
  - kening**: (empty)
  - Evidence Code**: ??
  - With/From**: ??
- Buttons**: Curation Record, +
- Additional GO Reference Records**: Additional GO Reference Records, Clear additional records

The bottom of the page shows the text "GO line editor".

# GO EDITOR



GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | ?? ?

Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	kening	Evidence Code	With/From	
??	lyBaseFB		cell wall thickening ; GO:0052386		??	??	+

Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP ?? Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	kening	Evidence Code	With/From	
??	lyBaseFB		cell wall thickening ; GO:0052386		IMP	??	<span>+</span>

Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP ?? Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	thickening	Evidence Code	With/From	
??	lyBaseFB		cell wall thickening ; GO:0052386		IMP	??	<span>+</span>

Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	thickening	Evidence Code	With/From	
??	FlyBaseFB		cell wall thickening ; GO:0052386		IMP	with	+

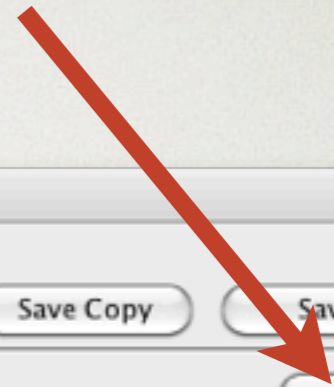
Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor

# ADD EVIDENCE GENE



GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	kening	Evidence Code	With/From
??	lyBaseFB		cell wall thickening ; GO:0052386		IMP	with

Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	kening	Evidence Code	With/From	Evidence gene 0 search..	
??	FlyBaseFB		cell wall thickening ; GO:0052386		IMP	with	??	+

Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	kening	Evidence Code	With/From	Evidence gene 0 search..	
??	lyBaseFB		cell wall thickening ; GO:0052386		IMP	with	??	+

Curation Record

cell wall thickening

Additional GO Reference Records Clear additional records

GO line editor



# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372 Save Copy Save Clear

Curation record	Provenance	Qualifier	GO search	kening	Evidence Code	With/From	Evidence gene 0 bar	
??	lyBaseFB		cell wall thickening ; GO:0052386		IMP	with	b; FB:FBgn0066372	+

Curation Record

cell wall thickening barb FBgn0066372

Additional GO Reference Records Clear additional records

GO line editor

# GO EDITOR

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372

Save Copy Save Clear

Curation record Provenance Qualifier GO search kening Evidence Code With/From Evidence gene 0 bar

?? FlyBaseFB cell wall thickening ; GO:0052386 IMP with ; FB:FBgn0066372

Curation Record

cell wall thickening barb FBgn0066372

Additional GO Reference Records Clear additional records

- FLYBASE:Dbar\Amy; FB:FBgn0021664
- FLYBASE:Dbar\His2A; FB:FBgn0064735
- FLYBASE:Dbar\His2B; FB:FBgn0064734
- FLYBASE:Dbar\mt:Coll; FB:FBgn0062820
- FLYBASE:Dbar\mt:ND4; FB:FBgn0083846
- FLYBASE:Dbar\mt:ND4L; FB:FBgn0083845
- FLYBASE:barb; FB:FBgn0066372**
- FLYBASE:barr; FB:FBgn0014127

GO line editor

# INFORMATION

GO-line

TimeStamp MacOS GO-line

FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372 Save Copy Save Clear

Curation record Provenance Qualifier GO search kening Evidence Code With/From Evidence gene 0 bar

?? lyBaseFB cell wall thickening ; GO:0052386 IMP with p; FB:FBgn0066372 +

Curation Record

**cell wall thickening**

id: GO:0052386  
name: cell wall thickening  
namespace: biological\_process  
def: "A type of cell wall modification in which the cell wall is reinforced and made thicker." [GOC:mtg\_p  
is\_a: GO:0042545 ! cell wall modification

**barb FBgn0066372**

- \*a barb
- \*z FBgn0066372
- \*e barb
- \*E FBrf0159552 == Dubnau et al., 2003, Curr. Biol. 13(4):
- \*T supplementary material
- \*Z cy1908 gm16509 gm24976.edit rc050218.e sm1205.edit sm861.edit
- \*d learning or memory ; GO:0007611 | IMP --- FlyBase @ 20060803
- \*d olfactory learning ; GO:0008355 | IMP --- FlyBase @ 20060803
- \*E FBrf0159398 == FlyBase Curators, 2002-, Use of the ND evidence code for Gene Ontology (G
- \*T FlyBase analysis
- \*f cellular\_component ; GO:0005575 | ND --- FlyBase @ 20060803
- \*F molecular\_function ; GO:0003674 | ND --- FlyBase @ 20060803

Additional GO Reference Records Clear additional records

GO line editor

# SAVE WORK

GO-line

TimeStamp MacOS GO-line

Save Copy Save Clear

Curation record Provenance Qualifier GO search kening Evidence Code With/From Evidence gene 0 bar

?? lyBaseFB cell wall thickening ; GO:0052386 IMP with ; FB:FBgn0066372

Curation Record

cell wall thickening

id: GO:0052386  
name: cell wall thickening  
namespace: biological\_process  
def: "A type of cell wall modification in which the cell wall is reinforced and made thicker." [GOC:mtg\_p  
is\_a: GO:0042545 ! cell wall modification

barb FBgn0066372

- \*a barb
- \*z FBgn0066372
- \*e barb
- \*E FBrf0159552 == Dubnau et al., 2003, Curr. Biol. 13(4):
- \*T supplementary material
- \*Z cy1908 gm16509 gm24976.edit rc050218.e sm1205.edit sm861.edit
- \*d learning or memory ; GO:0007611 | IMP --- FlyBase @ 20060803
- \*d olfactory learning ; GO:0008355 | IMP --- FlyBase @ 20060803
- \*E FBrf0159398 == FlyBase Curators, 2002-, Use of the ND evidence code for Gene Ontology (G
- \*T FlyBase analysis
- \*f cellular\_component ; GO:0005575 | ND --- FlyBase @ 20060803
- \*F molecular\_function ; GO:0003674 | ND --- FlyBase @ 20060803

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372 Edit Copy Edit Remove

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372

GO line editor

# OPEN CURATION RECORD

The screenshot displays the GO-line application interface. At the top, there are window controls and tabs for 'TimeStamp', 'MacOS', and 'GO-line'. Below this is a search bar with buttons for 'Save Copy', 'Save', and 'Clear'. The main interface features several dropdown menus for 'Curation record', 'Provenance', 'Qualifier', 'GO search', 'thickening', 'Evidence Code', and 'With/From'. The 'Evidence Code' dropdown is currently set to 'IMP', and the 'With/From' dropdown is set to 'with'. A red box highlights the 'Evidence gene 0 bar' dropdown, which is set to 'FB:FBgn0066372'. Below these menus is a 'Curation Record' button.

The main content area is divided into two panes. The left pane shows details for 'cell wall thickening', including its ID (GO:0052386), name, namespace (biological\_process), and definition. The right pane shows a list of curation records, with a red box highlighting the entry 'null: FlyBaseFB: cell wall thickening ;'. Below the list are buttons for 'Edit Copy', 'Edit', and 'Remove'.

A file selection dialog is open in the foreground, showing the file 'st1290.edit' selected in the 'astrecords' folder. The dialog lists several other files in the folder, all dated Monday, August 2, 2010, at 10:53 AM. The 'File Format' is set to 'All Files'. At the bottom of the dialog are buttons for 'New Folder', 'Cancel', and 'Open curation record'.

Name	Date Modified
st1281.edit	Monday, August 2, 2010 10:53 AM
st1282.edit	Monday, August 2, 2010 10:53 AM
st1283.edit	Monday, August 2, 2010 10:53 AM
st1284.edit	Monday, August 2, 2010 10:53 AM
st1285.edit	Monday, August 2, 2010 10:53 AM
st1286.edit	Monday, August 2, 2010 10:53 AM
st1287	Monday, August 2, 2010 10:53 AM
st1288.edit	Monday, August 2, 2010 10:53 AM
st1289.edit	Monday, August 2, 2010 10:53 AM
st1290.edit	Monday, August 2, 2010 10:53 AM

# OPEN CURATION RECORD

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

wg FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372 Save Copy Save Clear

Curation Record

**cell wall thickening**

id: GO:0052386  
name: cell wall thickening  
namespace: biological\_process  
def: "A type of cell wall modification in which the cell wall is reinforced and made thicker." [GOC:mtg\_p  
is\_a: GO:0042545 ! cell wall modification

**barb FBgn0066372**

\*a barb  
\*z FBgn0066372  
\*e barbos  
\*E FBrf0159552 == Dubnau et al., 2003, Curr. Biol. 13(4):  
\*T supplementary material  
\*Z cy1908 gm16509 gm24976.edit rc050218.e sm1205.edit sm861.edit  
\*d learning or memory ; GO:0007611 | IMP --- FlyBase @ 20060803  
\*d olfactory learning ; GO:0008255 | IMP --- FlyBase @ 20060803

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386   IMP with FLYBASE:barb; FB:FBgn0066372	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:wg frizzled-2 binding ; GO:0005110   IPI with FLYBASE:fz2; FB:FBgn0016797	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:fz2 Wnt-protein binding ; GO:0017147   IPI with FLYBASE:wg; FB:FBgn0004009	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
fz2 || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit

# OPEN CURATION RECORD

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

st1290.edit FBrf0190314::fz2 FlyBaseFB: Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009 Save Copy Save Clear

Curation record Provenance Qualifier GO search kening Evidence Code With/From Evidence gene 0 bar

90314::fz2 FlyBaseFI Wnt-protein binding ; GO:0017147 IPI with g; FB:FBgn0004009 +

Curation Record

Wnt-protein binding

id: GO:0017147  
name: Wnt-protein binding  
namespace: molecular\_function  
def: "Interacting selectively and non-covalently with Wnt-protein, a secreted growth factor involved in is\_a: GO:0005515 ! protein binding

wg FBgn0004009

\*a wg  
\*z FBgn0004009  
\*X CG4889  
\*e wingless  
\*m UniProtKB/Swiss-Prot:P09615  
\*j IPR005816  
\*j IPR005817  
\*j IPR018161

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372 Edit Copy Edit Remove

st1290.edit FBrf0190314::wg frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797 Edit Copy Edit Remove

st1290.edit FBrf0190314::arr Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009 Edit Copy Edit Remove

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit

# EDIT EXISTING

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

wg FlyBaseFB: Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009 Save Copy Save Clear

Curation record Provenance Quali GO search kening Evidence Code With/From Evidence gene 0 bar  
wg FlyBaseFI Wnt-protein binding ; GO:0017147 IPI with FLYBASE:wg; FB:FBgn0004009 +

Curation Record

**Wnt-protein binding**

id: GO:0017147  
name: Wnt-protein binding  
namespace: molecular\_function  
def: "Interacting selectively and non-covalently with Wnt-protein, a secreted growth factor involved in is\_a: GO:0005515 ! protein binding

**wg FBgn0004009**

\*a wg  
\*z FBgn0004009  
\*X CC4889  
\*e wingless  
\*m UniProtKB/Swiss-Prot:P09615  
\*j IPR005816  
\*j IPR005817  
\*j IPR018161

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386   IMP with FLYBASE:barb; FB:FBgn0066372	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:wg frizzled-2 binding ; GO:0005110   IPI with FLYBASE:fz2; FB:FBgn0016797	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:arr Wnt-protein binding ; GO:0017147   IPI with FLYBASE:wg; FB:FBgn0004009	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit



# EDIT EXISTING

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

wg FlyBaseFB: Wnt-protein binding ; GO:0017147 | IPI with Save Copy Save Clear

Curation record Provenance Quali GO search kening Evidence Code With/From

wg FlyBaseFI Wnt-protein binding ; GO:0017147 IPI with +

Curation Record

**Wnt-protein binding**

id: GO:0017147  
name: Wnt-protein binding  
namespace: molecular\_function  
def: "Interacting selectively and non-covalently with Wnt-protein, a secreted growth factor involved in signal  
is\_a: GO:0005515 ! protein binding

**wg FBgn0004009**

\*a wg  
\*z FBgn0004009  
\*X CG4889  
\*e wingless  
\*m UniProtKB/Swiss-Prot:P09615  
\*j IPR005816  
\*j IPR005817  
\*j IPR018161

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386   IMP with FLYBASE:barb; FB:FBgn0066372	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:wg frizzled-2 binding ; GO:0005110   IPI with FLYBASE:fz2; FB:FBgn0016797	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:arr Wnt-protein binding ; GO:0017147   IPI with FLYBASE:wg; FB:FBgn0004009	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit

# EDIT EXISTING

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

wg FlyBaseFB: Wnt-protein binding ; GO:0017147 | IPI with Save Copy Save Clear

Curation record Provenance Quali GO search kening Evidence Code With/From Evidence gene 0 search..

wg FlyBaseFI Wnt-protein binding ; GO:0017147 IPI with ?? +

Curation Record

**Wnt-protein binding**

id: GO:0017147  
name: Wnt-protein binding  
namespace: molecular\_function  
def: "Interacting selectively and non-covalently with Wnt-protein, a secreted growth factor involved in signaling"  
is\_a: GO:0005515 ! protein binding

**wg FBgn0004009**

\*a wg  
\*z FBgn0004009  
\*X CG4889  
\*e wingless  
\*m UniProtKB/Swiss-Prot:P09615  
\*j IPR005816  
\*j IPR005817  
\*j IPR018161

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386   IMP with FLYBASE:barb; FB:FBgn0066372	<span>Edit Copy</span> <span>Edit</span> <span>Remove</span>
st1290.edit FBrf0190314:wg frizzled-2 binding ; GO:0005110   IPI with FLYBASE:fz2; FB:FBgn0016797	<span>Edit Copy</span> <span>Edit</span> <span>Remove</span>
st1290.edit FBrf0190314:arr Wnt-protein binding ; GO:0017147   IPI with FLYBASE:wg; FB:FBgn0004009	<span>Edit Copy</span> <span>Edit</span> <span>Remove</span>

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit

# THE END.

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

wg FlyBaseFB: Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:ken; FB:FBgn0011236 Save Copy Save Clear

Curation record	Provenance	Quali	GO search	kening	Evidence Code	With/From	Evidence gene 0 ken
wg	FlyBaseFI		Wnt-protein binding ; GO:0017147		IPI	with	FLYBASE:ken; FB:FBgn0011236

Curation Record

**Wnt-protein binding**

id: GO:0017147  
name: Wnt-protein binding  
namespace: molecular\_function  
def: "Interacting selectively and non-covalently with Wnt-protein, a secreted growth factor involved in signaling"  
is\_a: GO:0005515 ! protein binding

**ken FBgn0011236**

\*a ken  
\*z FBgn0011236  
\*X CG5575  
\*e ken and barbie  
\*m UniProtKB/Swiss-Prot:O77459  
\*j IPR000210  
\*j IPR007087  
\*i IPR011222

Additional GO Reference Records Clear additional records

null: FlyBaseFB: cell wall thickening ; GO:0052386   IMP with FLYBASE:barb; FB:FBgn0066372	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:wg frizzled-2 binding ; GO:0005110   IPI with FLYBASE:fz2; FB:FBgn0016797	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>
st1290.edit FBrf0190314:arr Wnt-protein binding ; GO:0017147   IPI with FLYBASE:wg; FB:FBgn0004009	<span>Edit Copy</span>	<span>Edit</span>	<span>Remove</span>

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit

# ALMOST

/Users/hif22/astrecords/st1290.edit

TimeStamp MacOS GO-line

Save Copy Save Clear

Curation record Provenance Quali GO search kening Evidence Code With/From Evidence gene 0 ken

wg FlyBaseFI Wnt-protein binding ; GO:0017147 IPI with FLYBASE:ken; FB:FBgn0011236

Curation Record

Wnt-protein binding ken FBgn0011236

id: GO:0017147  
name: Wnt-protein binding  
namespace: molecular\_function  
def: "Interacting selectively and non-covalently with Wnt-protein, a secreted growth factor involved in signaling"  
is\_a: GO:0005515 ! protein binding

\*a ken  
\*z FBgn0011236  
\*X CG5575  
\*e ken and barbie  
\*m UniProtKB/Swiss-Prot:O77459  
\*j IPR000210  
\*j IPR007087  
\*j IPR011232

Additional GO Reference Records Clear additional records

null:: FlyBaseFB: cell wall thickening ; GO:0052386   IMP with FLYBASE:barb; FB:FBgn0066372	Edit Copy	Edit	Remove
st1290.edit FBrf0190314:wg frizzled-2 binding ; GO:0005110   IPI with FLYBASE:fz2; FB:FBgn0016797	Edit Copy	Edit	Remove
st1290.edit FBrf0190314:wg FlyBaseFB: Wnt-protein binding ; GO:0017147   IPI with FLYBASE:ken; FB:FBgn0011236	Edit Copy	Edit	Remove
st1290.edit FBrf0190314:arr Wnt-protein binding ; GO:0017147   IPI with FLYBASE:wg; FB:FBgn0004009	Edit Copy	Edit	Remove

|| FlyBaseFB: cell wall thickening ; GO:0052386 | IMP with FLYBASE:barb; FB:FBgn0066372  
wg || frizzled-2 binding ; GO:0005110 | IPI with FLYBASE:fz2; FB:FBgn0016797  
wg || FlyBaseFB: Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:ken; FB:FBgn0011236  
arr || Wnt-protein binding ; GO:0017147 | IPI with FLYBASE:wg; FB:FBgn0004009

Curation record(s): /Users/hif22/astrecords/st1290.edit

# DETAILS

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- Mac OS X (testing) 10.5 and 10.6 preAlpha\_v002
- 3.8GB RAM but may use less
- Flat file input but also talks to postgres
- Configurable (text file)
- Designed by the CURATORS
- Thanks to FlyBase Curators: Steve Marygold, Gillian Millburn, Steph Bunt, Simon Reeve, Pete McQuilton, Dave Osumi Sutherland, Ray Stefancsik, Nick Brown and Advisory Board members

# FUTURE

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- chado queries
- XML config / s for clever editor
- API in collaboration
- JSP or J2EE / SOAP web interface
  - Helen Imogen Field
  - hif22 @ gen.cam.ac.uk