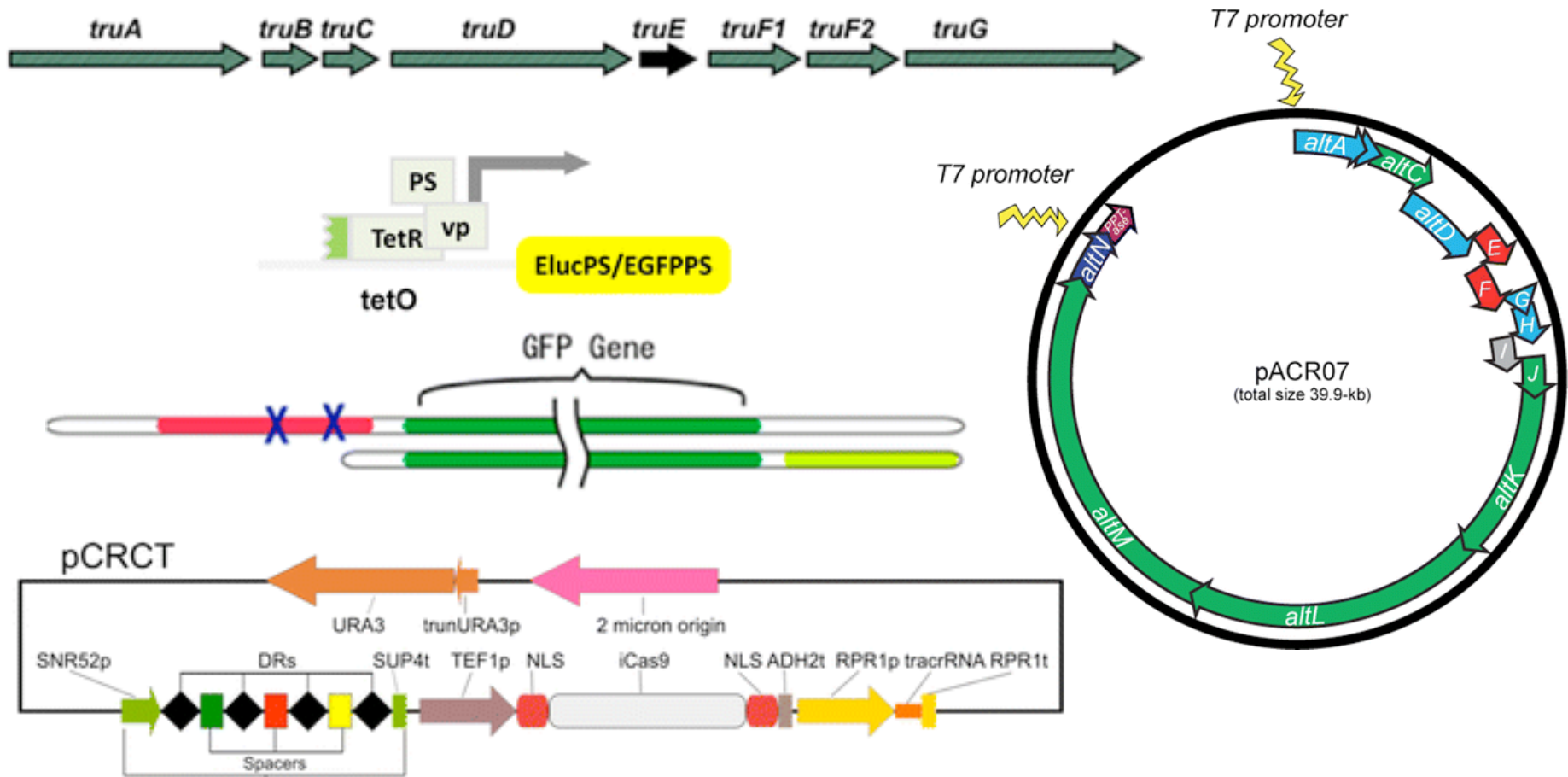


# Introduction to SBOL Visual

SBOL Visual Community  
Last revised: August 2016

# Problem: Communicating Gene Constructs

*Construct diagrams from some recent ACS Syn.Bio. papers:*

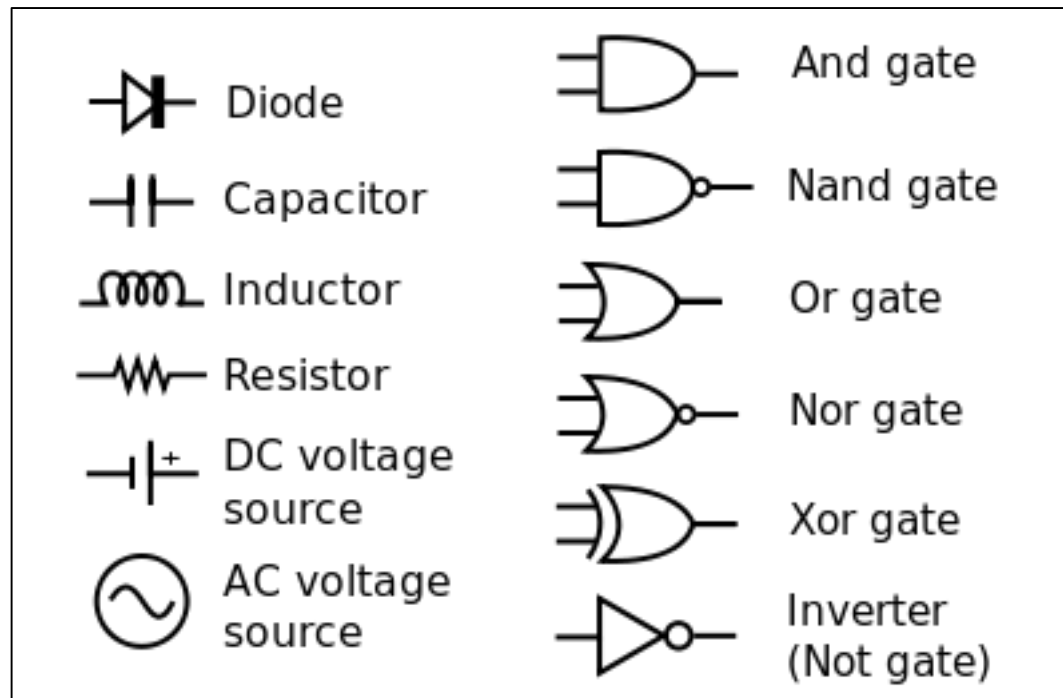


*Well, they're sort of similar...*

# Standards simplify communication



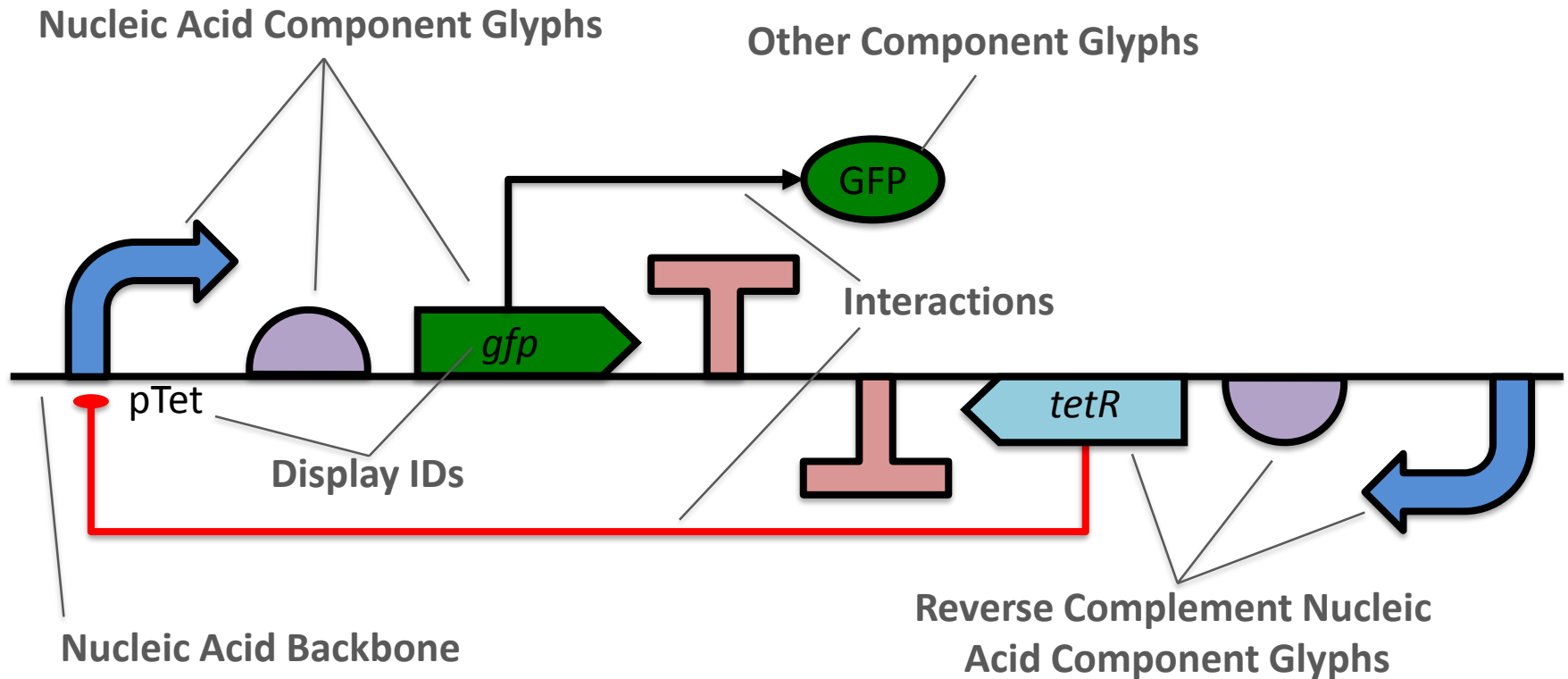
## Inspiration: Standard Electronic Symbols:



... and many others in IEEE Std. 91/91a; IEEE Std. 315

*What is the equivalent for synthetic biology?*

# Elements of SBOL Visual:



Synthetic Biology Open Language - Visual

Community standards in development since 2008






















SBOL Visual 1.0: BBF RFC #93 [doi: 1721.1/78249](https://doi.org/10.17211/78249)

SBOL Visual 2.0: <https://github.com/SynBioDex/SBOL-visual>

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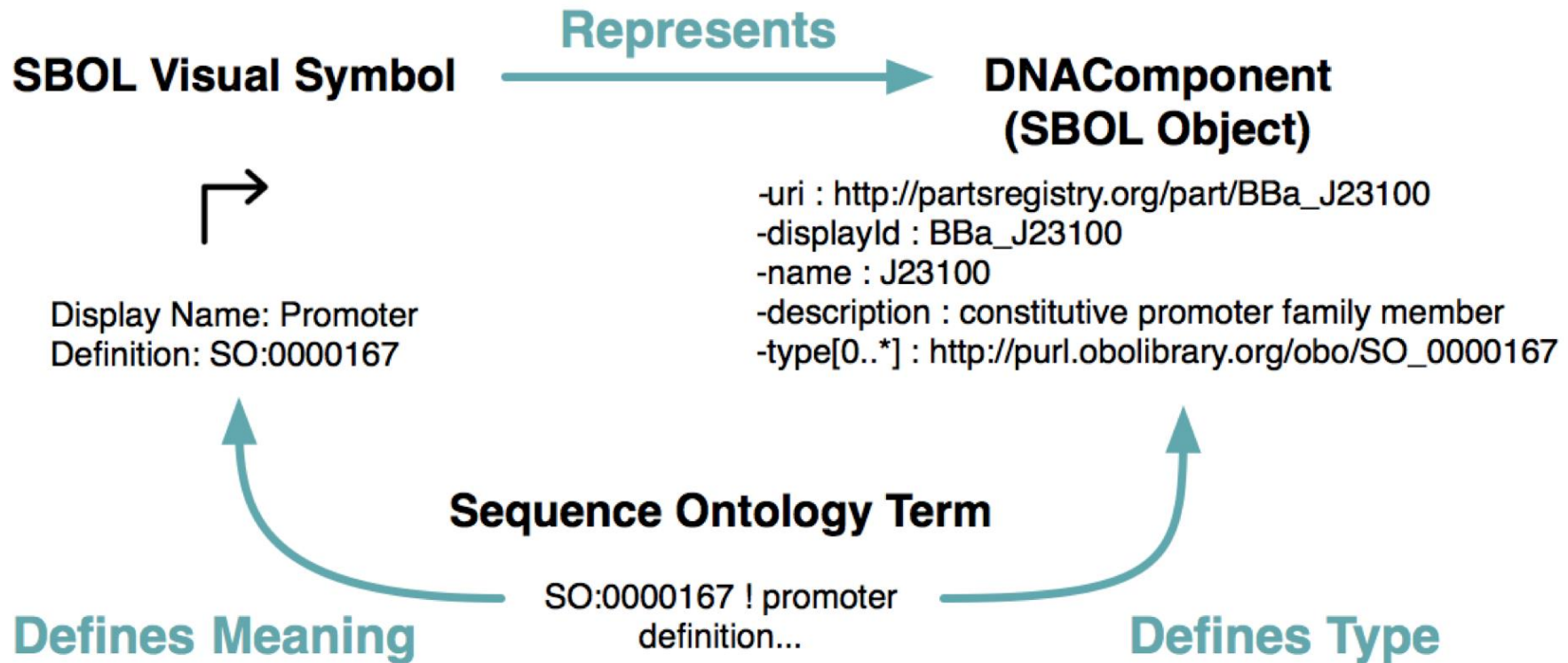
# Current SBOLv Symbols:



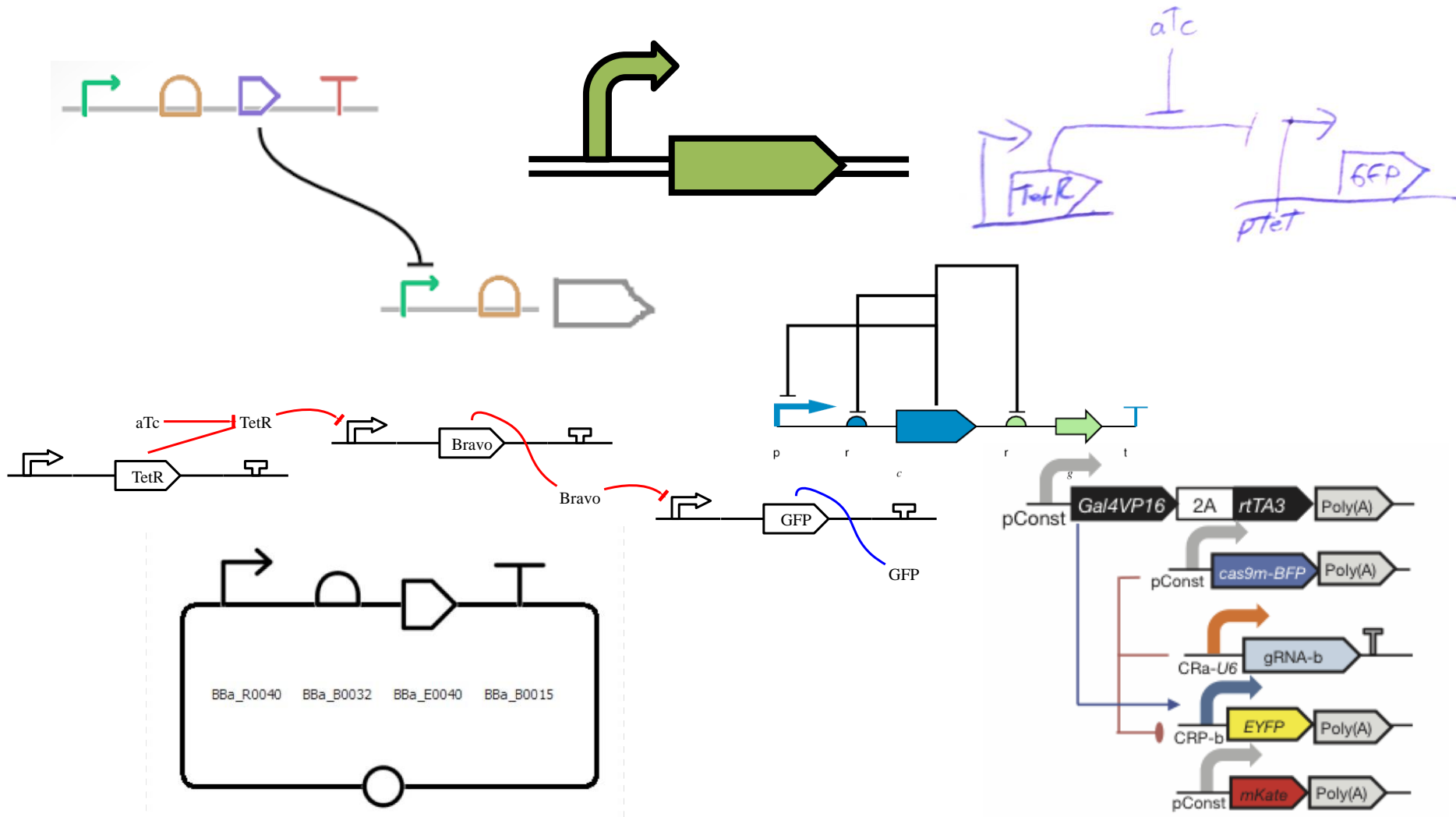
 promoter	 primer binding site
 cds	 restriction site
 ribosome entry site	 blunt restriction site
 terminator	 5' sticky restriction site
 operator	 3' sticky restriction site
 insulator	 5' overhang
 ribonuclease site	 3' overhang
 rna stability element	 assembly scar
 protease site	 signature
 protein stability element	 user defined
 origin of replication	

*New symbols, variants added by community consensus*

# Backing by Formal Semantics

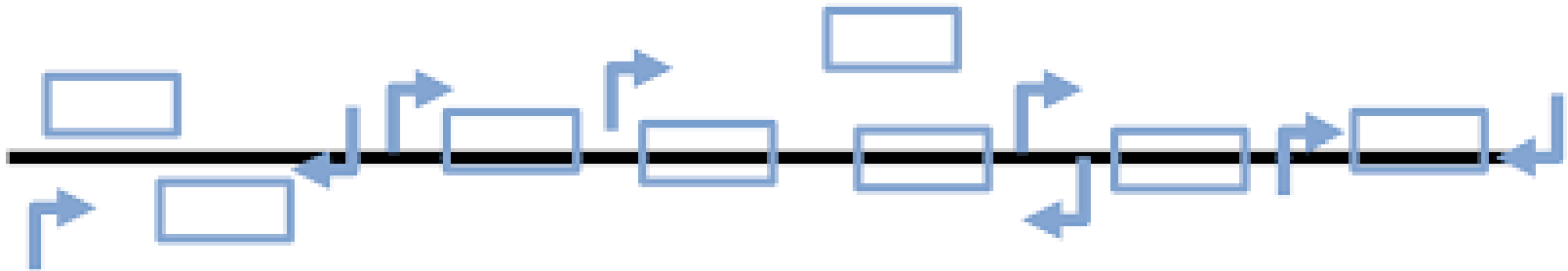


# Flexibility of Style



*Color, Text, Scaling, Line, Strands: all your choice*

# Is anything prohibited?



**Yes.**

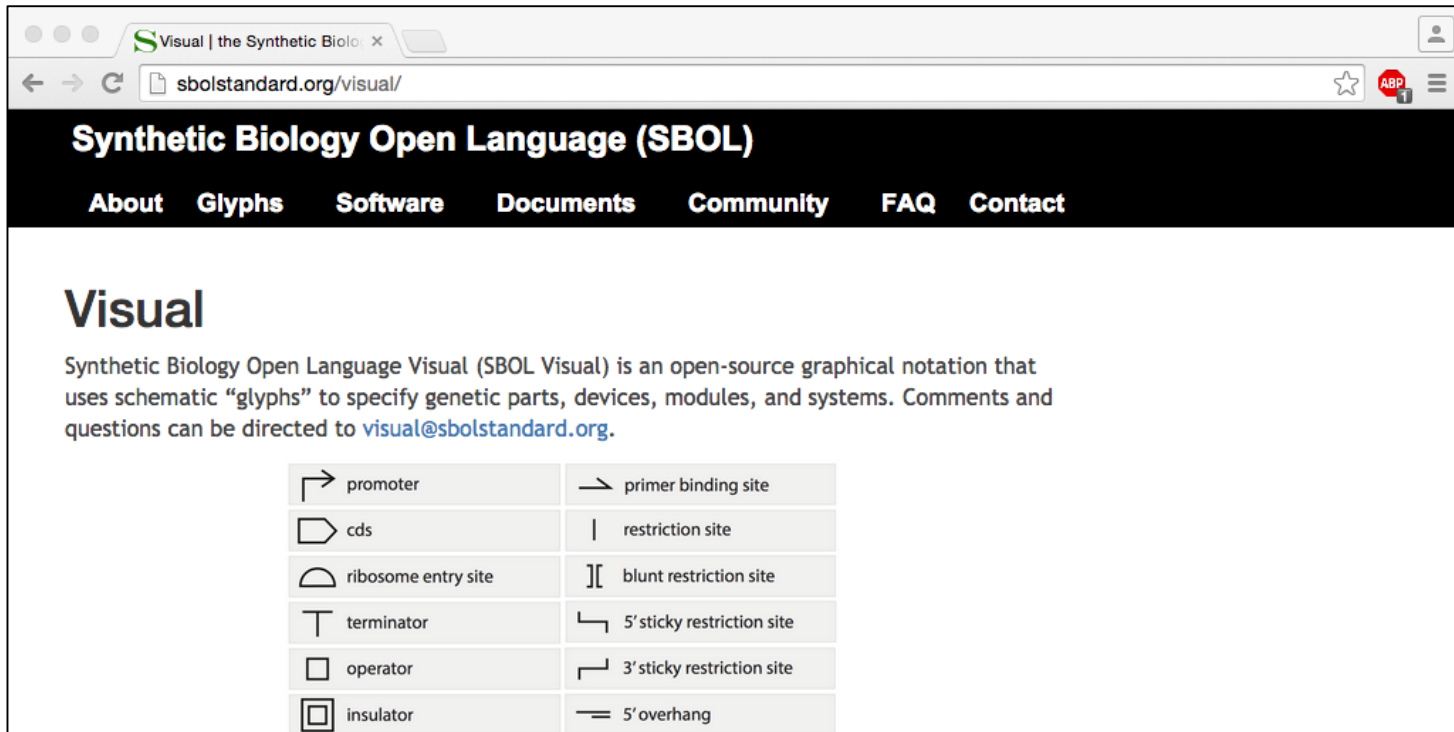














# Making SBOL Visual Diagrams



- Using your favorite graphics editor:
  - Many icons can be drawn directly
  - Icons available from: <http://sbolstandard.org/visual/>
- Specialized visualization tools:
  - Pigeon: <http://pigeoncad.org/>
  - VisBOL: <http://visbol.org/design/>
  - GraphViz: <http://www.graphviz.org/>
  - DNAPlotLib: <https://github.com/VoigtLab/dnaplotlib>

- Use the symbols in your papers & talks
- Contribute opinions, use cases, new symbols

A screenshot of a web browser displaying the SBOL Visual website. The browser's address bar shows 'sbolstandard.org/visual/'. The page has a black header with the text 'Synthetic Biology Open Language (SBOL)' and a navigation menu with links for 'About', 'Glyphs', 'Software', 'Documents', 'Community', 'FAQ', and 'Contact'. The main content area is titled 'Visual' and contains a paragraph describing SBOL Visual as an open-source graphical notation for genetic parts. Below the text is a table of symbols and their corresponding names.

	promoter		primer binding site
	cds		restriction site
	ribosome entry site		blunt restriction site
	terminator		5' sticky restriction site
	operator		3' sticky restriction site
	insulator		5' overhang

- Community is open for anyone to join