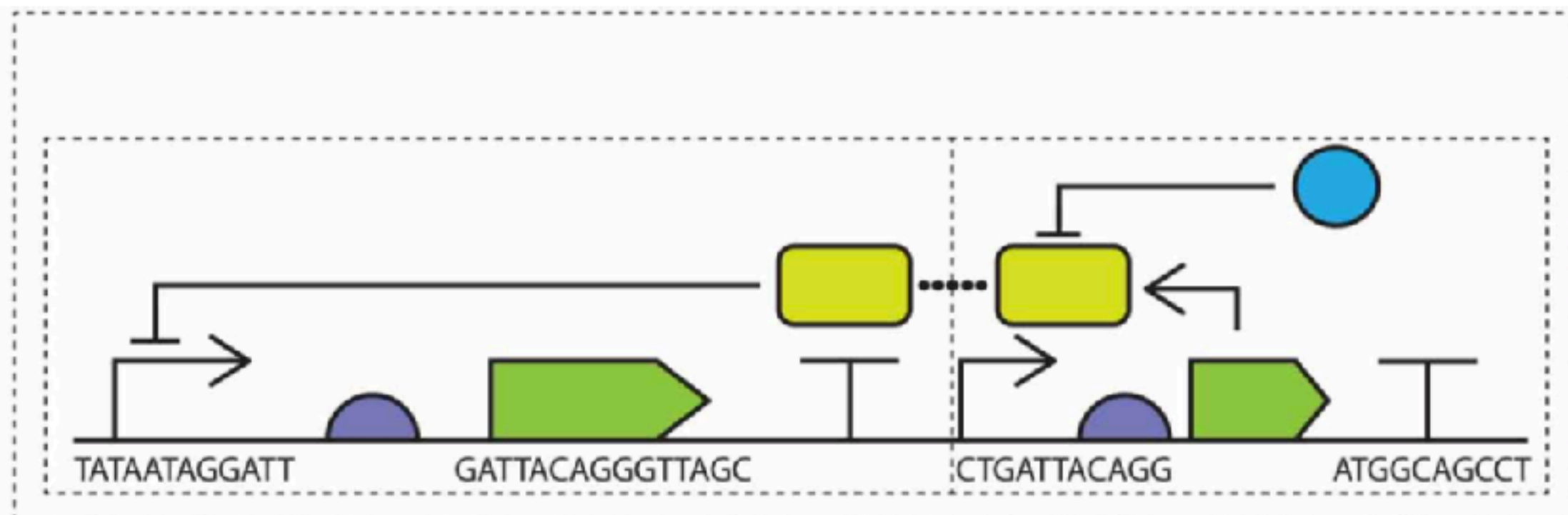


# **SBOL Visual**

Thomas Gorochoowski

**SBOL 2**



**SBOL 1**



**GenBank**

Promoter	RBS	CDS	Terminator	Promoter	RBS	CDS	Terminator
TATAATAGGATT	CCGCAATG	GATTACAGGGTTAGC	AAATGGCAGC	CTGATTACAGG	AAATGGCAGC	GTTAGCAAATGGCAGCCT	

# SBOL Visual 2.0 Glyphs

## Nucleic Acid Glyphs

Aptamer	Assembly Scar	Blunt Restriction Site	(recommended) CDS	(alternate) CDS	Composite	Engineered Region	3' Overhang Sticky End
5' Overhang Sticky End	3' Sticky Restriction Site	5' Sticky Restriction Site	Insulator	No Glyph	Non-Coding RNA	Omitted Detail	Operator
ORI	ORI-T	Poly-A Site	Primer Binding Site	Promoter	Ribosome Entry Site	Signature	Recombination Site
Terminator	(recommended) Unspecified	(alternate) Unspecified	(recommended) DNA Location	(recommended) RNA Location	(recommended) Protein Location	(alternate) DNA Location	(alternate) RNA Location
(alternate) Protein Location	DNA Cleavage Site	RNA Cleavage Site	Protein Cleavage Site	DNA Stability Element	RNA Stability Element	Protein Stability Element	

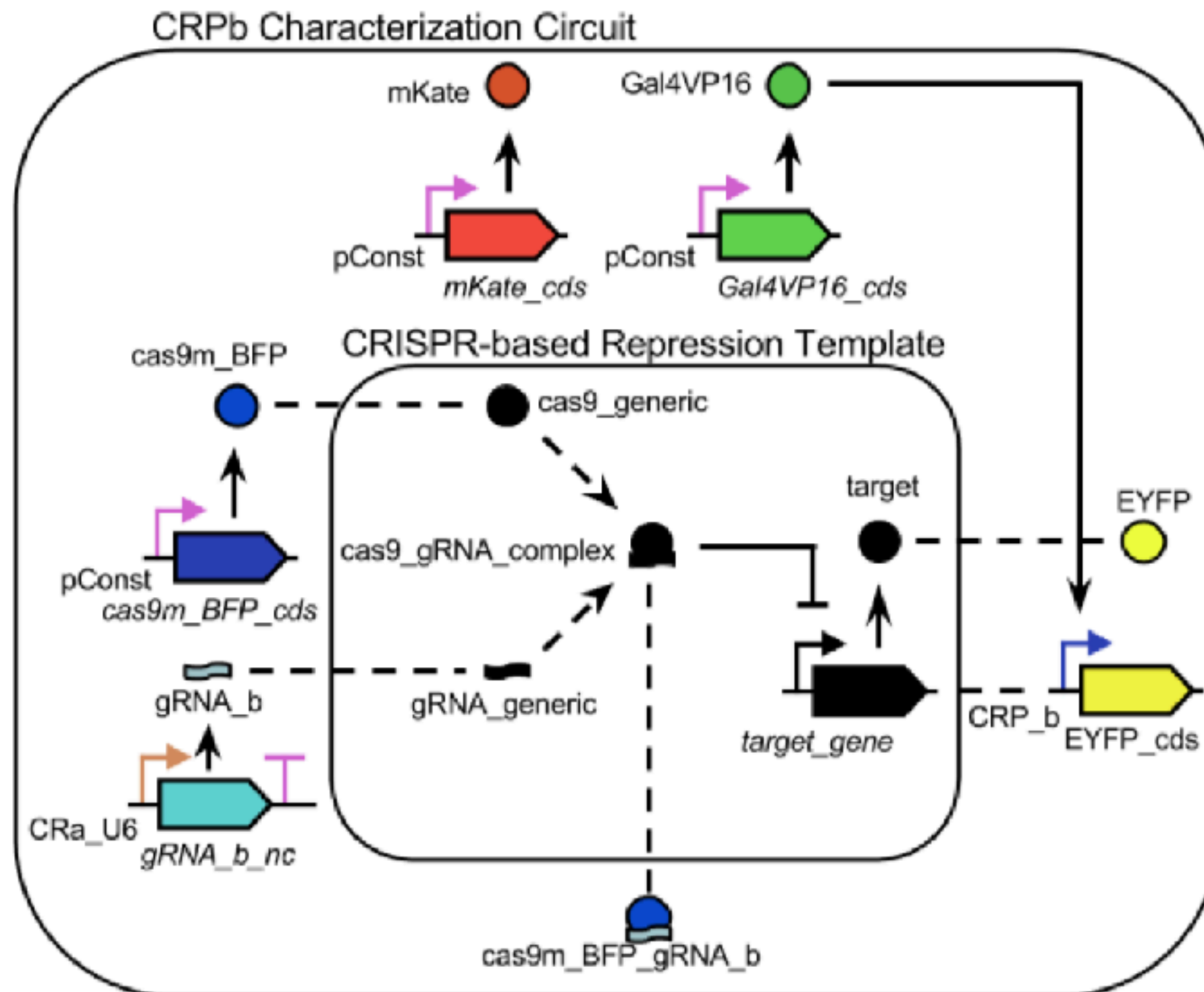
## Molecular Species Glyphs

Superpose Glyphs Complex	(alternate) Complex	(recommended) Macromolecule	(alternate) Macromolecule	No Glyph	Nucleic Acid (Generic)
Nucleic Acid (1-Strand)	Nucleic Acid (2-Strand)	Small Molecule	(recommended) Unspecified	(alternate) Unspecified	

## Interaction Glyphs

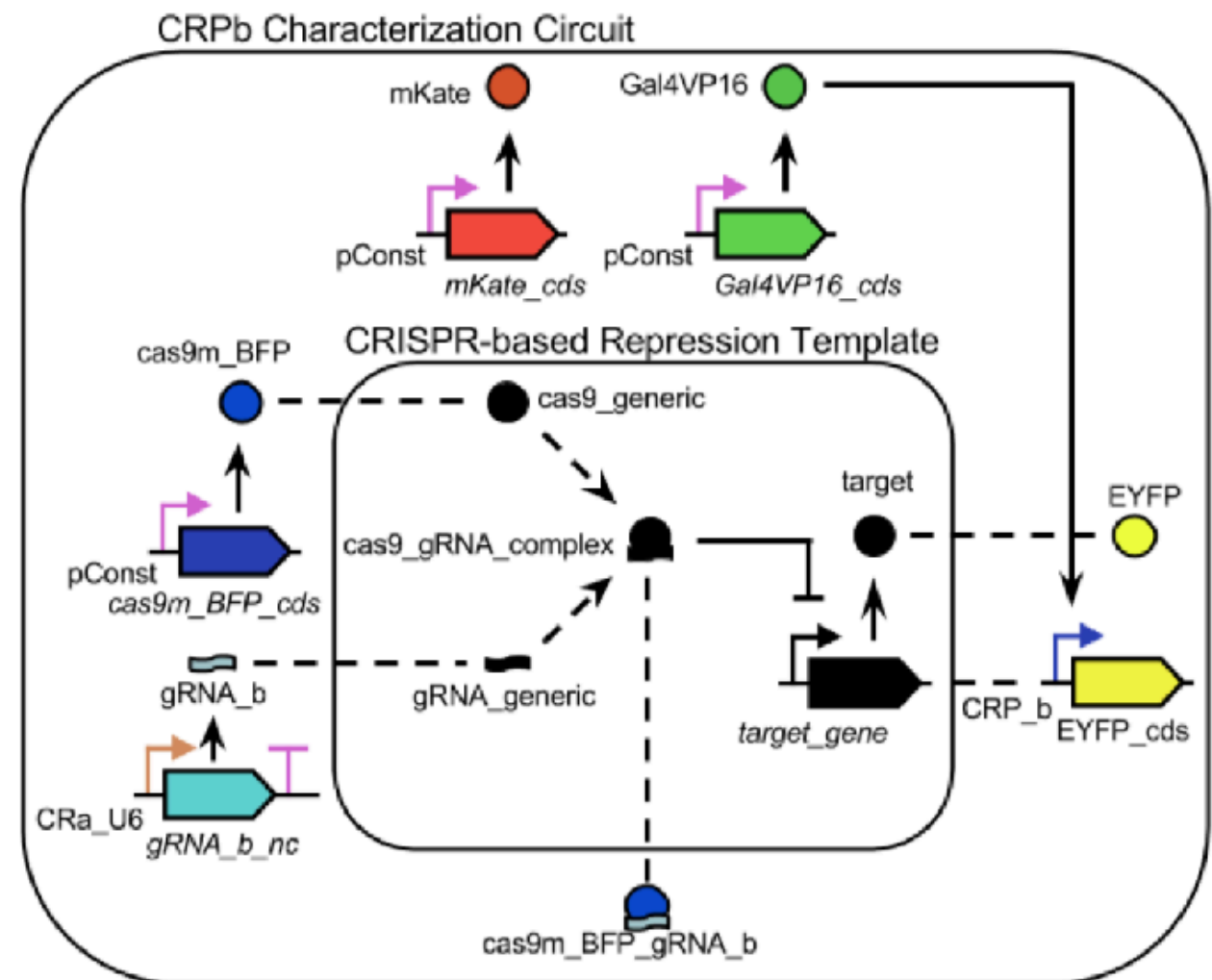
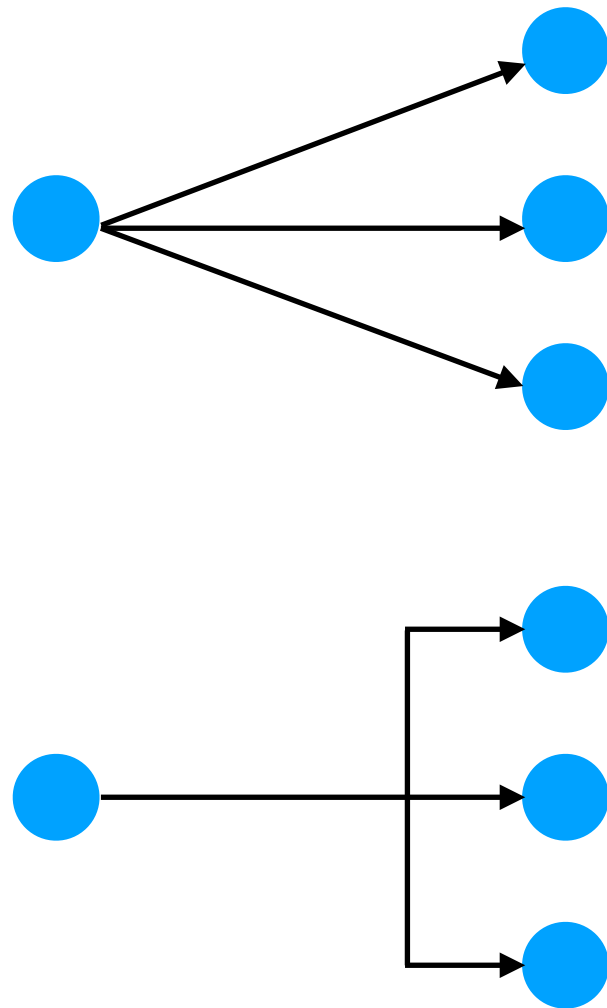
Control	Degradation	Inhibition	Process	Stimulation

# How to Handle Complex Designs?



# SBOL Visual 2.1

- **Interactions**
  - Multiple origins and sources
- **Visualisation of Modules, Hierarchy and MapsTo**




















































# SBOL Visual 3.0

- **Parametric Glyphs Library**
  - ▶ Machine-readable format with allowed variants
  - ▶ Adapted Parametric-SVG? (<http://parametric-svg.js.org>)
  - ▶ Automated build of preview pages upon commit
- **Requirements when Submitting a Glyph**
  - ▶ SBO terms in addition to BioPAX?
  - ▶ Parametric definition of glyph?
- **Examples Library – Visual Unit Tests?**

# **SBOL Visual Activities for HARMONY**

- **SBOL Visual Paper (Actions?)**
  - "Communicating Structure and Function in Synthetic Biology Diagrams"
- **SBOL 2.1 Spec Updates**
- **Generation of Standardised SVG Glyphs**

Arrows	Blobs			Stems		
	Fixed aspect ratio	Variable aspect ratio	Custom	No Top	Non-Arrow Top	Arrow Top
			 holeHeight holeWidth			
			 arrow options			
			 spacing			
			 overhangLength			
			 spacing			
						
						
						
						
		AAA				
						
						
						
						
						
						
						
						
						
						
						
						
	width	width height	width height	tailWidth tailHeight	tailWidth tailHeight  headHeight headWidth	tailWidth tailHeight  arrowbodyWidth arrowbodyHeight arrowheadHeight arrowheadWidth
arrowbodyWidth arrowbodyHeight arrowheadHeight arrowheadWidth						