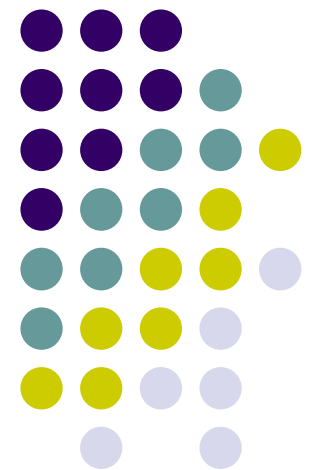


Molecular Interactions Research Group (MIRG)

ABRF 2011, Feb 19-22



MIRG members:

Simon Bergqvist, Pfizer

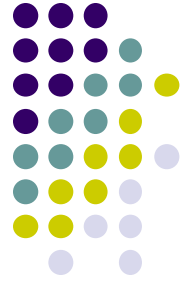
Mike Doyle, Bristol-Myers Squibb

Matthew Robinson, Fox Chase

Satya Yadav, Cleveland Clinic

Aaron Yamniuk (Chair), Bristol-Myers Squibb

Thomas Neubert (EB liaison), New York University School of Medicine



Agenda

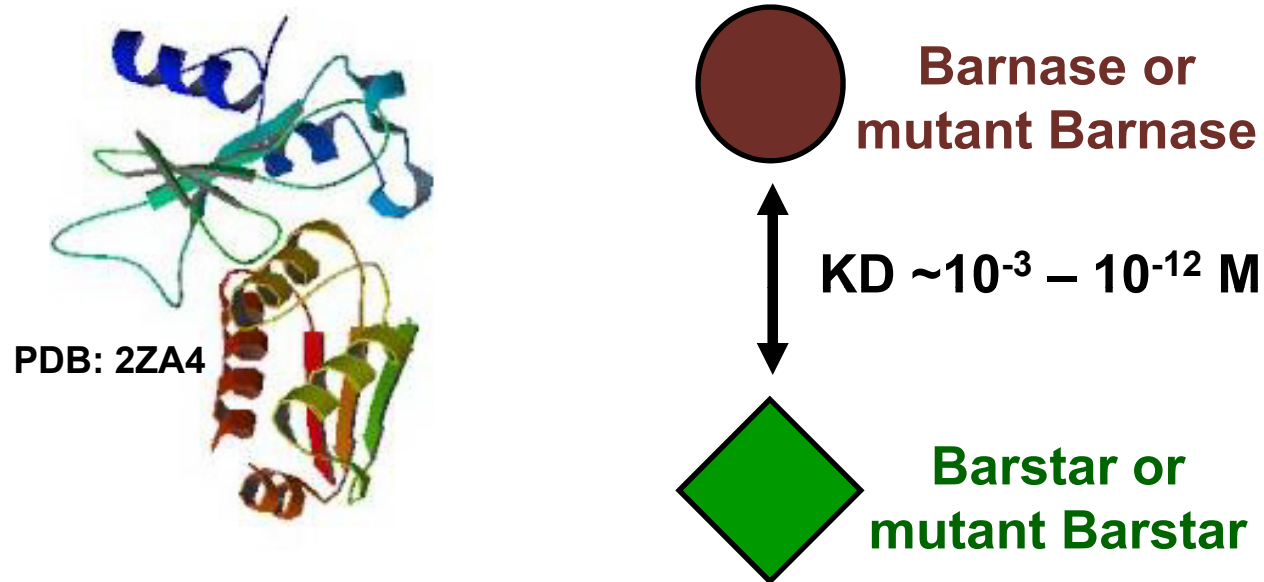
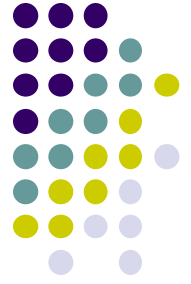
- **MIRG overview:** (*Aaron Yamniuk, Bristol-Myers Squibb, Princeton NJ*)
 - **Mission, objectives**
 - **Summary of MIRG 2010 Benchmark Study**
- **2011 Survey Results on Label-Free Technologies** (*Satya Yadav, Cleveland Clinic Foundation, Cleveland OH*)



MIRG Mission

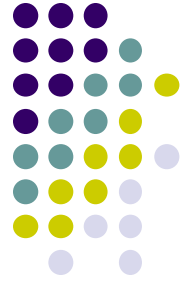
- To show how biophysical tools (biosensor, ITC and AUC) are used to **quantitatively characterize molecular interactions**
- To show how these tools work in a resource facility environment
- To **educate** the ABRF members in the methodologies of the three core technologies
- To **provide test systems** to be used to compare the capabilities of individual laboratories with each other, either within the three disciplines or among the disciplines
- To compile the results of the analyses of these systems and **publish** the results in the Journal of Biomolecular Techniques or other appropriate publications
- To meet regularly to organize and run workshops or other activities at the annual ABRF meetings to accomplish this mission

Objective: Develop a Molecular Interactions Reference Standard ...



- well characterized proteins (structure, folding, binding)
- large collection of mutants available ($K_D 10^{-3} - 10^{-12} \text{ M}$)
- favorable stability and solubility properties
- Potential benchmark for different laboratories and new technologies

Objective: MIRG 2010 Benchmark study



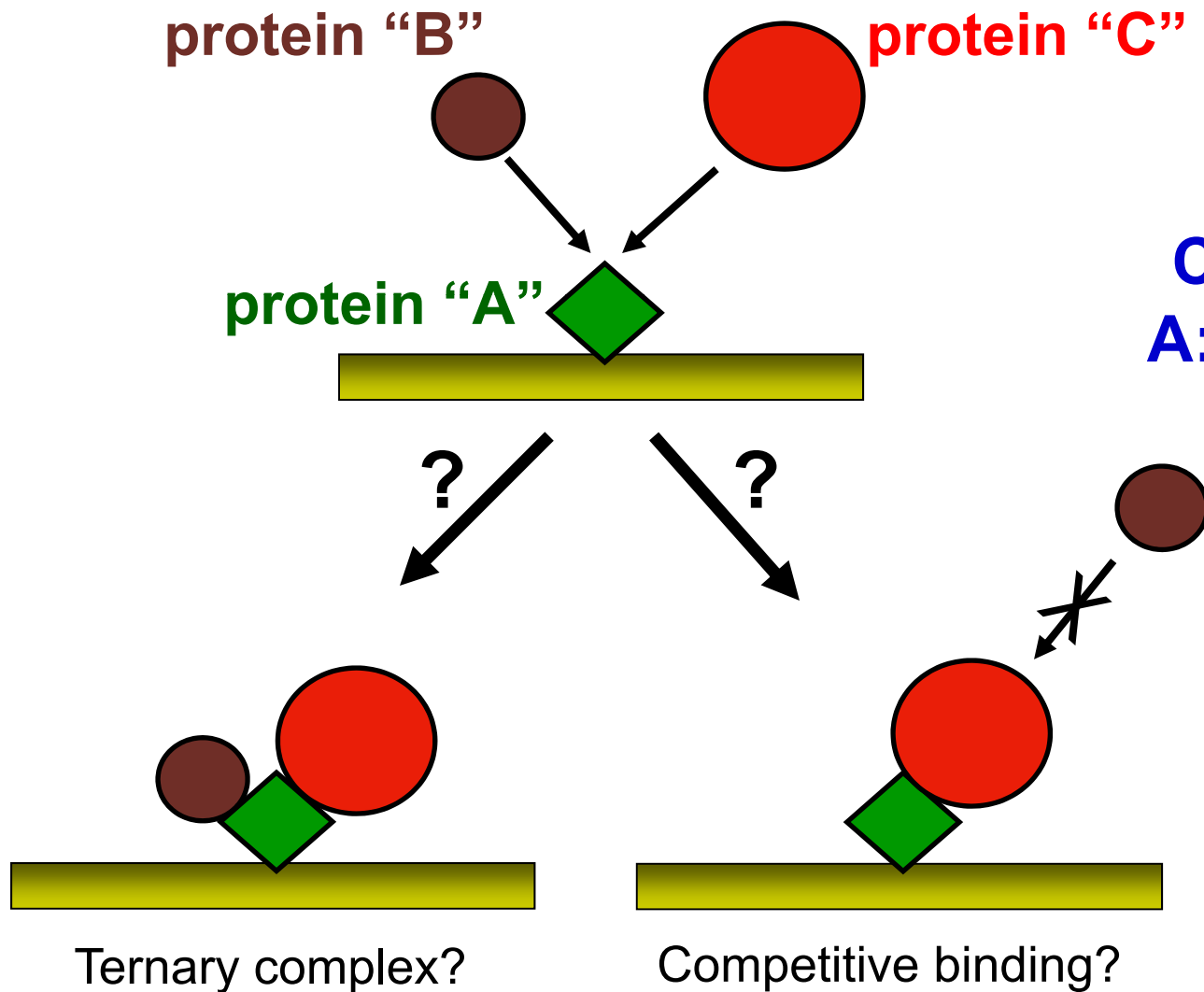
Ongoing effort:

Develop the Barstar/Barnase system as molecular interactions reference standard

2010 Benchmark Study:

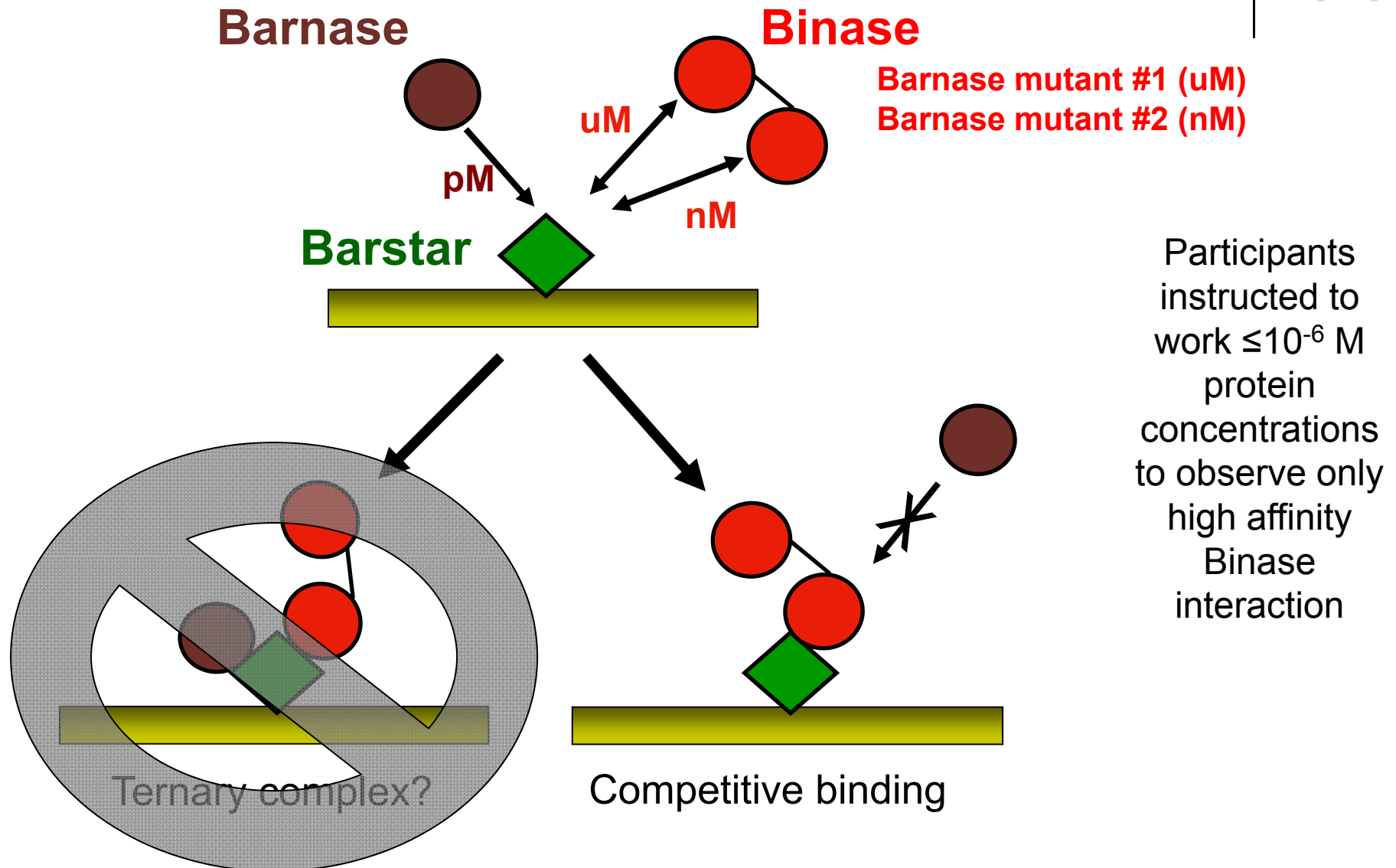
Employ the Barstar/Barnase system in a benchmark study which addresses a specific question of interest to the field

Objective of the MIRG 2010 Benchmark Study

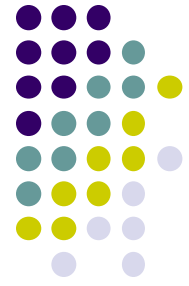


Question:
Can a ternary
A:B:C complex
form?

Objective of the MIRG 2010 Benchmark Study



Summary: MIRG 2010 Study Results



- Samples prepared (30), sent (20), data received (14)

Technique	SPR (Surface Plasmon Resonance)	SPR (Surface Plasmon Resonance)	BLI (BioLayer Interferometry)	MS (Mass Spectrometry)
#Participants	10	1	1	2
Instrument	Biacore T100 (4), 2000/3000 (6)	Icx Nomadics - SensiQ Pioneer	ForteBio Octet Red 384	- MALDI (1) - ESI-MS (1)

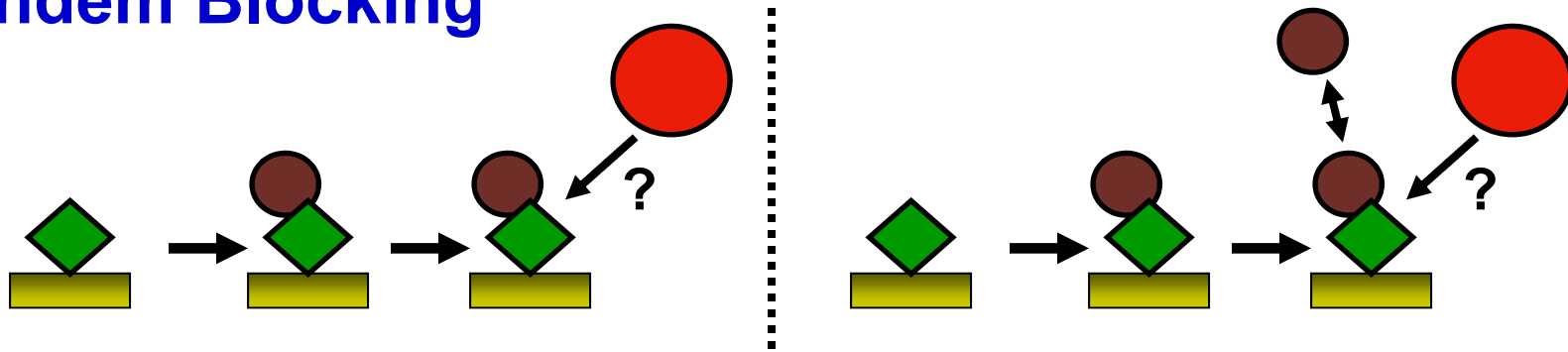
- **7 variations** on biosensor competition experiments were used
- **Results:** Can ternary complex form?
 - No (9*), Yes (3*), no result (2)
- See (www.ABRF.org/MIRG) for detailed summary of results
 - (*manuscript also in preparation for JBT*)

* One participant stated that ternary complex can form in solution but not on chip surface

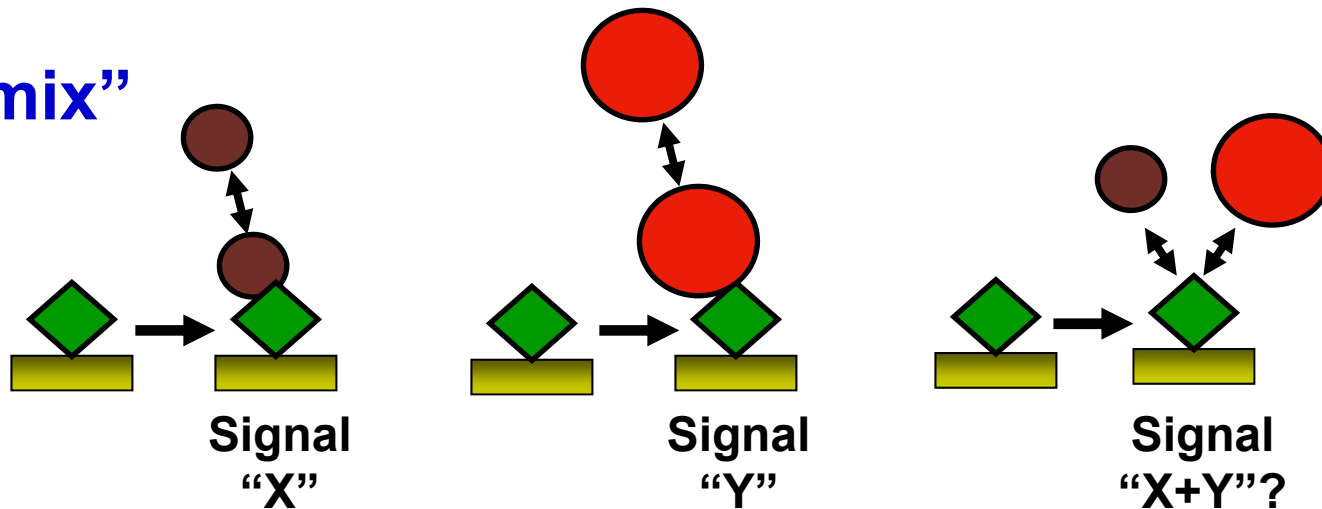
Common experimental designs from MIRG2010 Study



“Tandem Blocking”



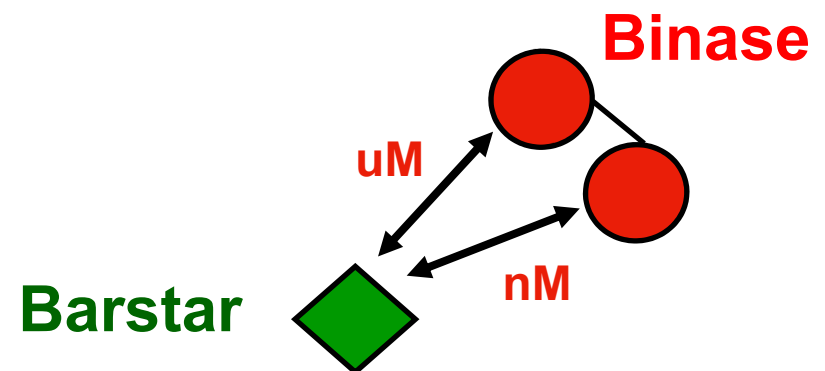
“Premix”



MIRG next steps / progress towards development of a reference standard



- 2010 Benchmark Study manuscript for JBT publication
- Demonstrate favorable stability for selected Binase and Barstar variants (MIRG laboratories)
- Collect more binding data (biosensor, ITC, AUC) to test the suitability of binase/barstar system as reference standard
 - a) MIRG laboratories
 - b) Participant laboratories



Acknowledgements



MIRG Members

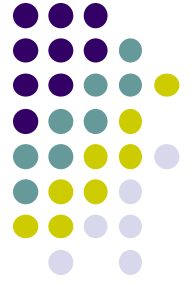
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- **Matthew Robinson**, Fox Chase
- **Satya Yadav**, Cleveland Clinic
- **Aaron Yamniuk** (Chair), Bristol-Myers Squibb
- **Thomas Neubert** (EB liaison), New York University School of Medicine

Collaborators

- **Ed Eisenstein**, University Maryland Biotechnology Institute
- **Suzanne Edavettal**, Bristol-Myers Squibb (PERG)
- **Noah Ditto**, Bristol-Myers Squibb
- **Brian Carpenter**, Bristol-Myers Squibb
- **James Bryson**, Bristol-Myers Squibb (PERG)

2010 Benchmark Study Participants

MIRG Membership



- Interested in joining the MIRG?
 - Please contact Aaron Yamniuk (MIRG Chair) at aaron.yamniuk@bms.com