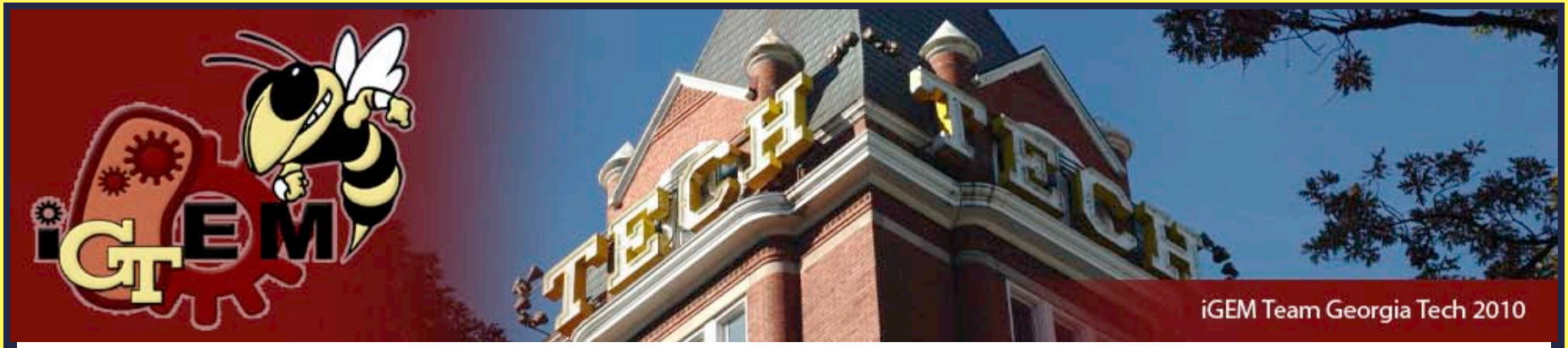
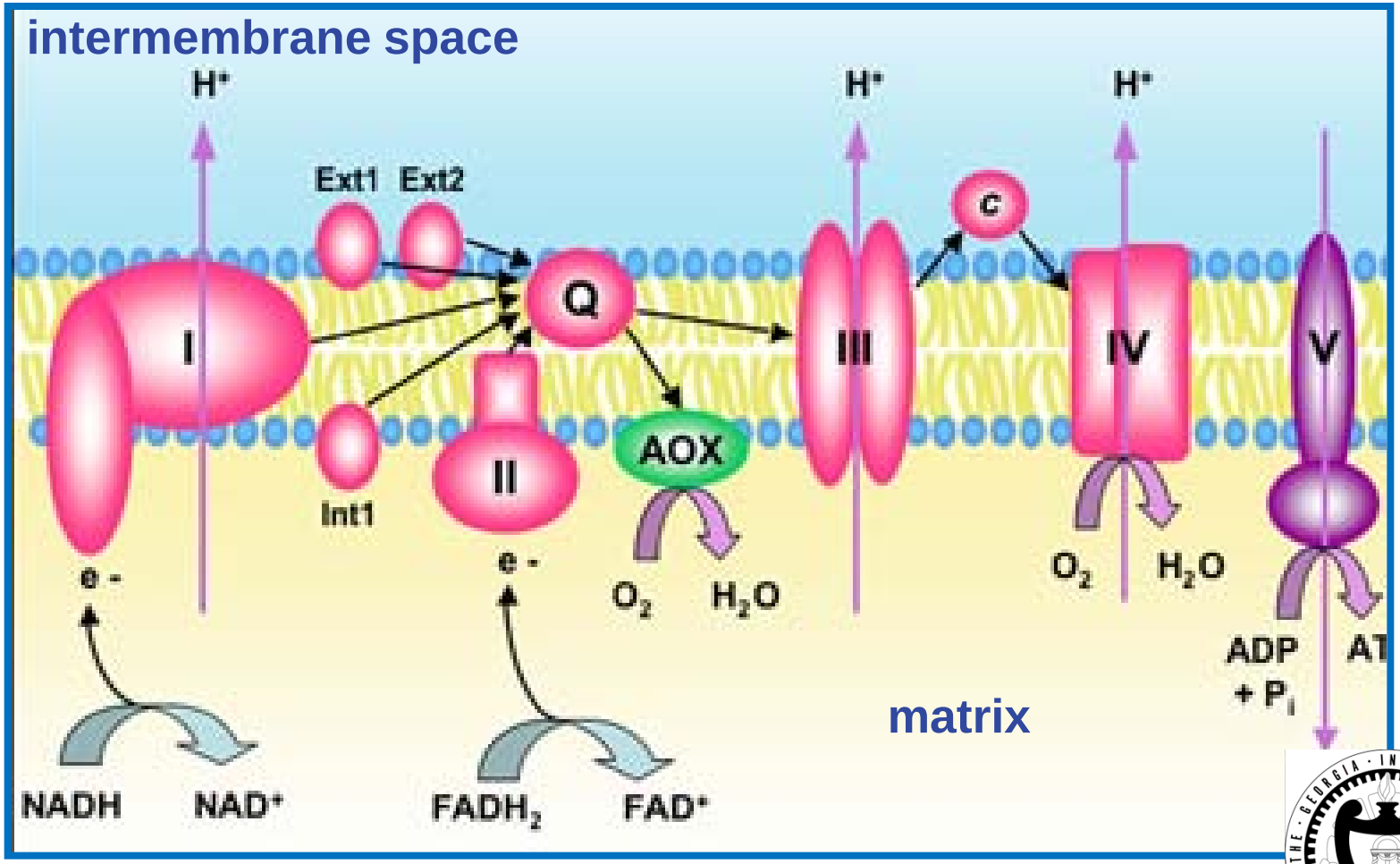


Inducing a thermogenic response to cold shock in *Escherichia coli*

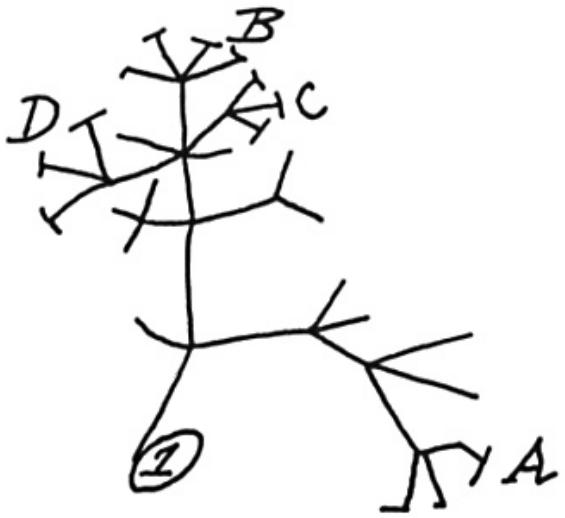
Georgia Institute of Technology

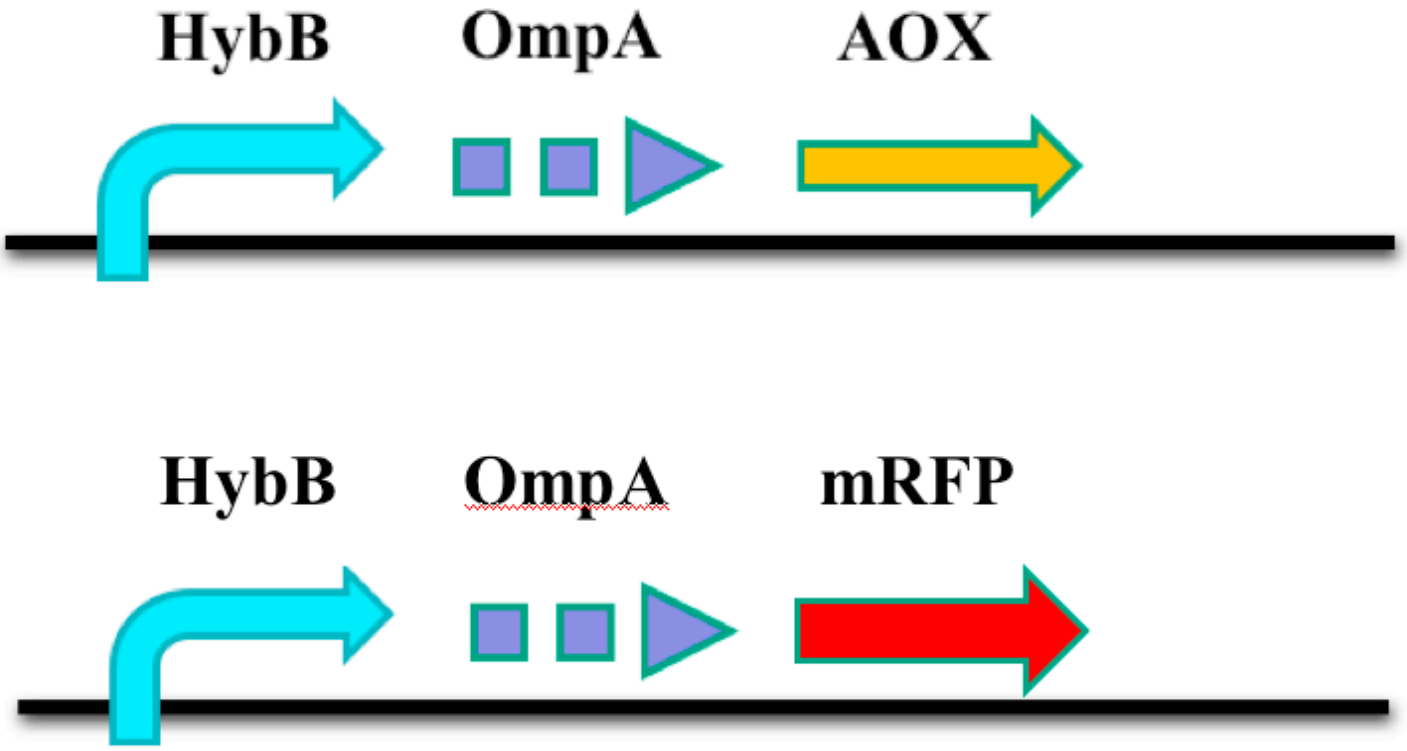
November 18, 2010

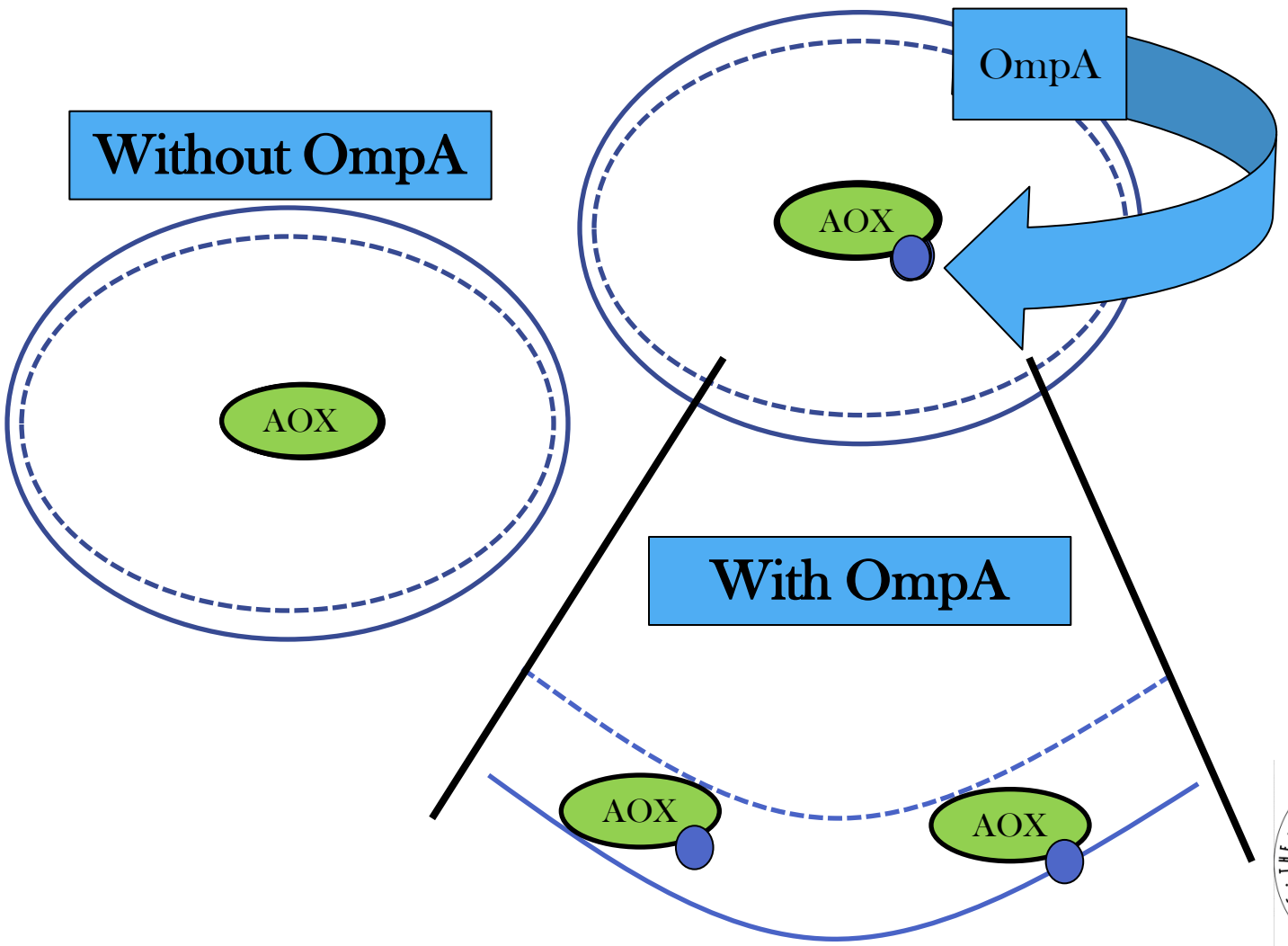
Heat generating gene: AOX



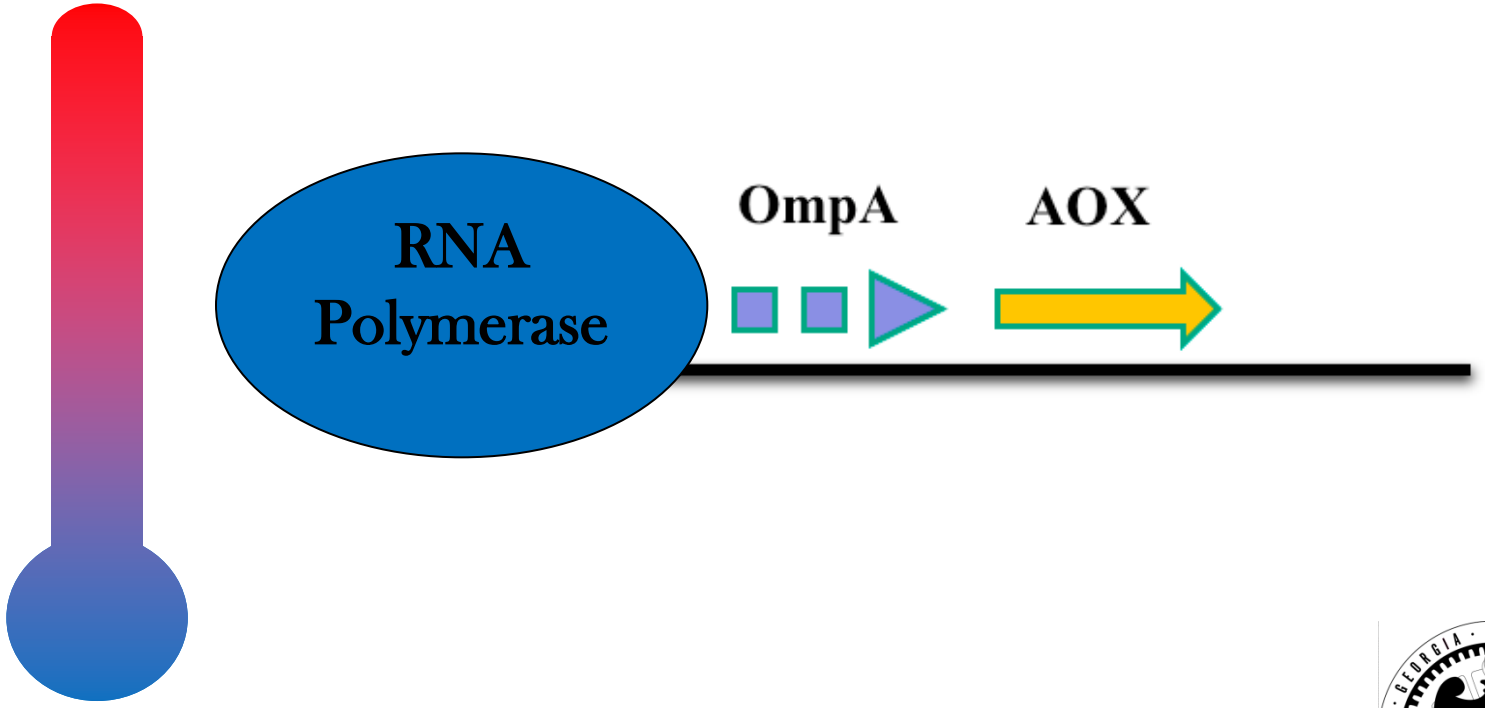

50
60
70
80
Honeywell
50
60
70
80
HONEYWELL


B
C
D
A

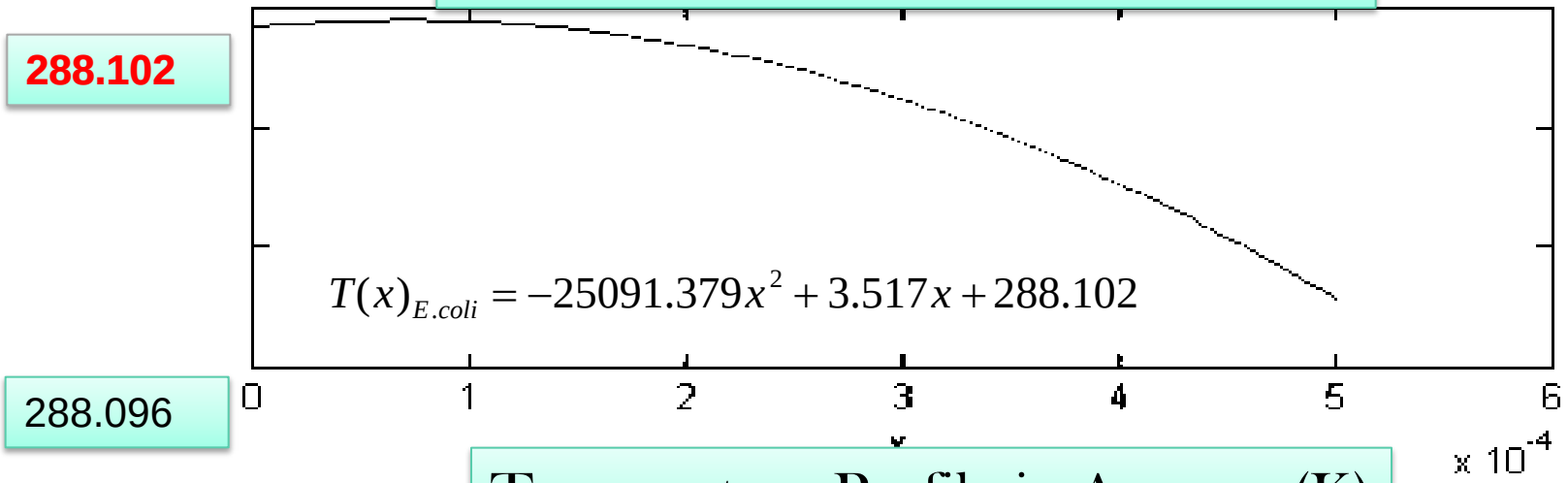

HybB
OmpA
AOX
HybB
OmpA
mRFP


Without OmpA
AOX
OmpA
AOX
With OmpA
AOX
AOX

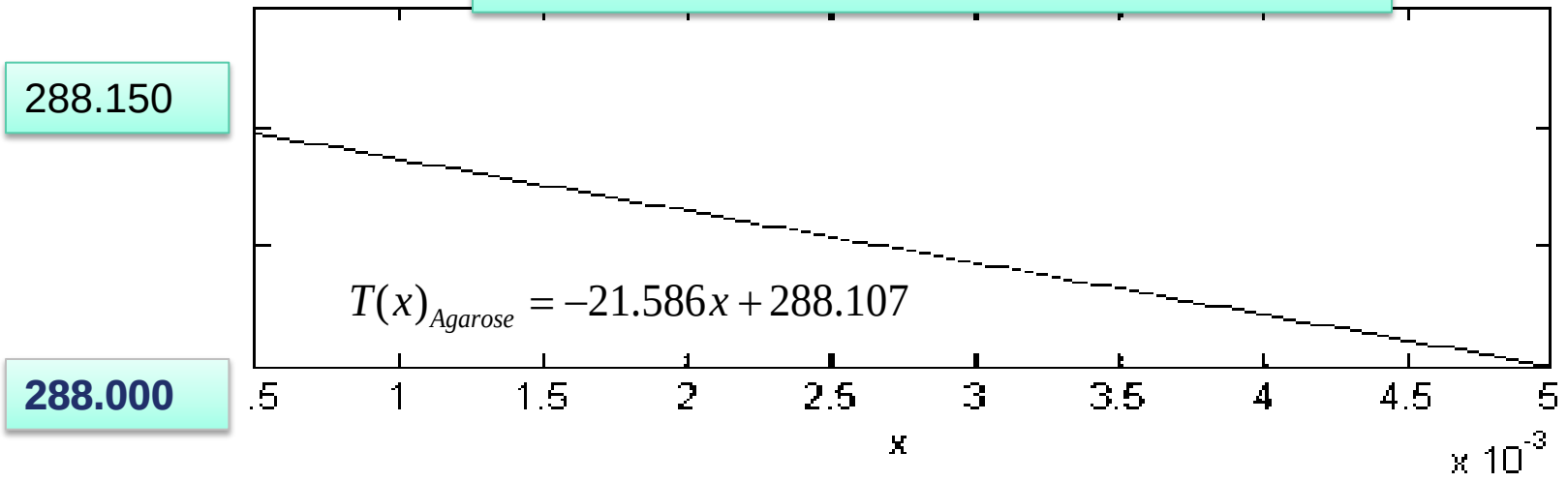
Cold Shock Response

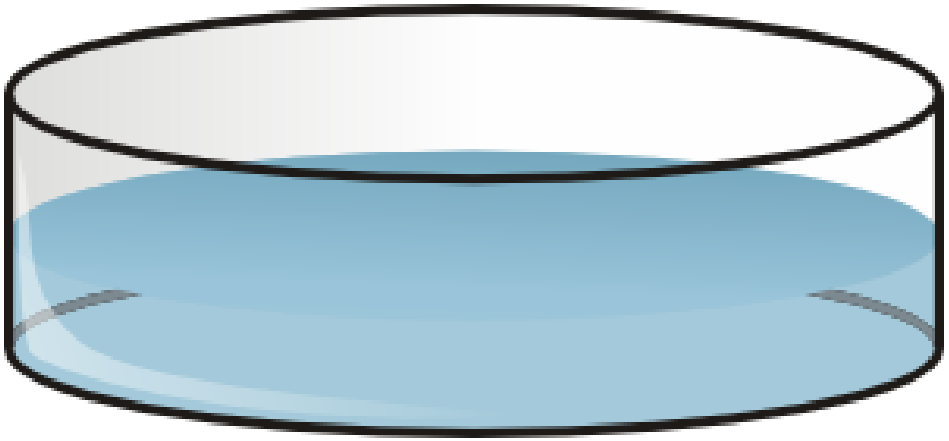


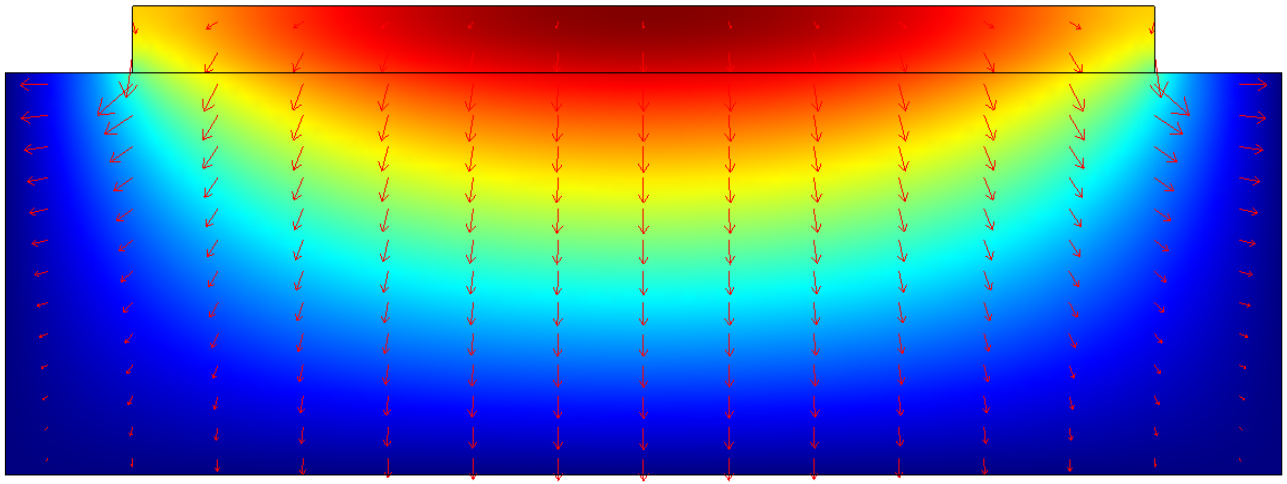
Temperature Profile In E. coli (K)

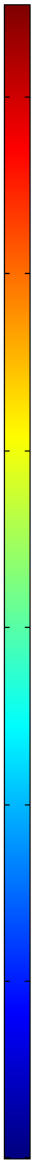


Temperature Profile in Agarose (K)







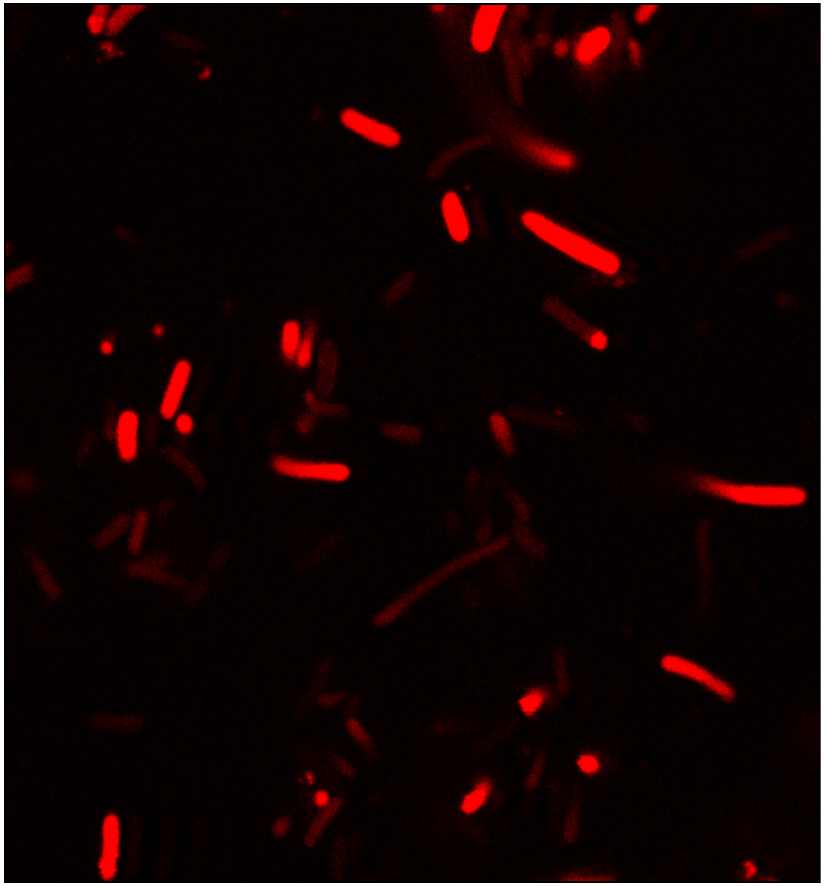


288.065

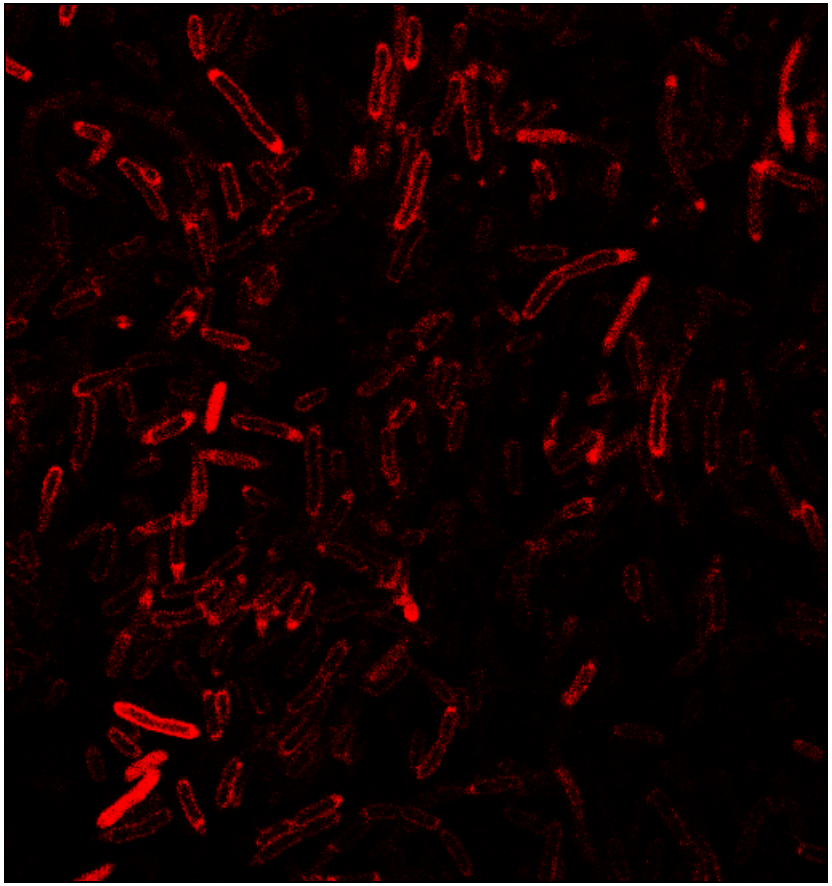
288.000


gilson


Hamilton Bell
VanGuard V6500

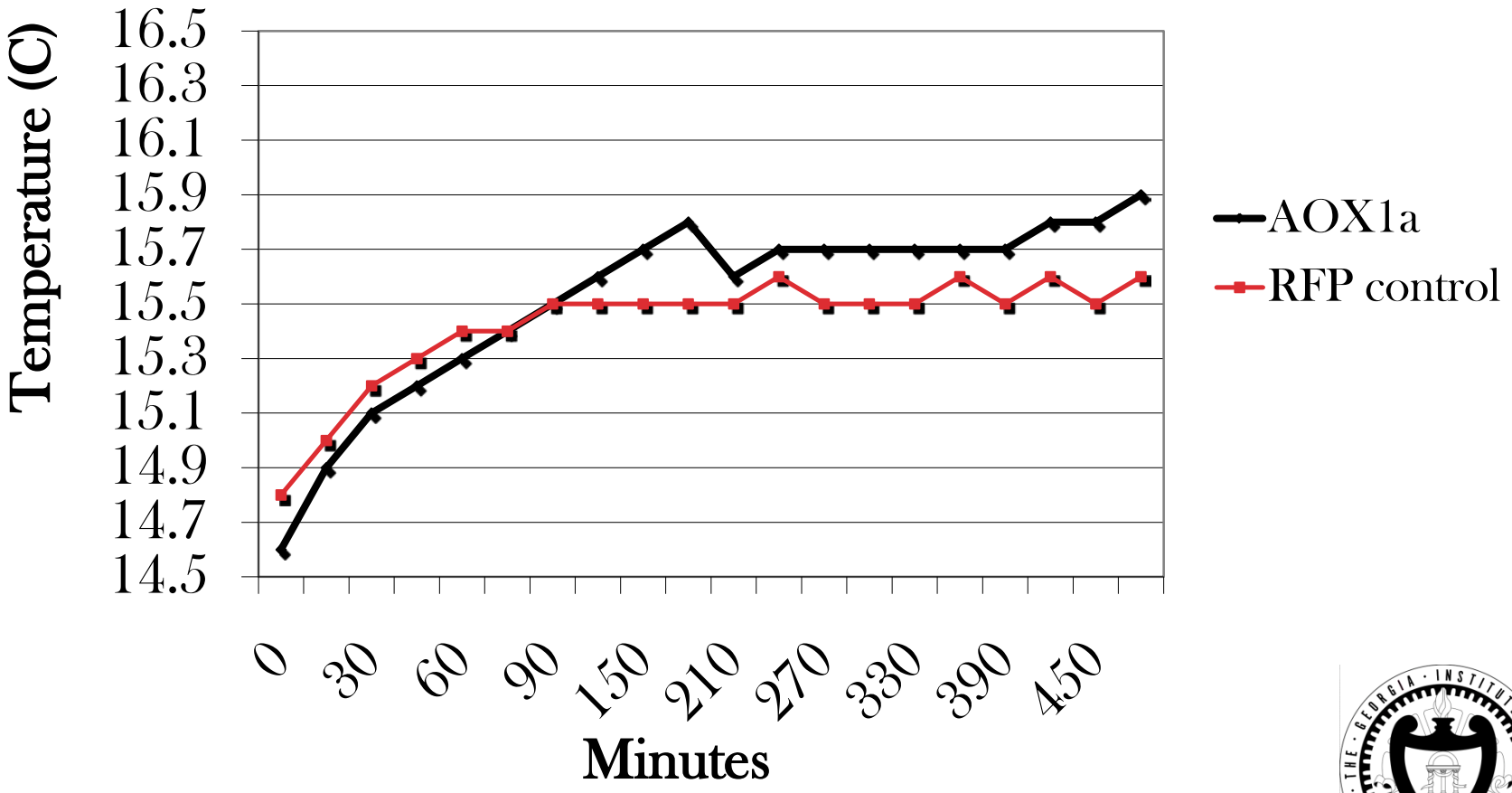


HybB-mRFP

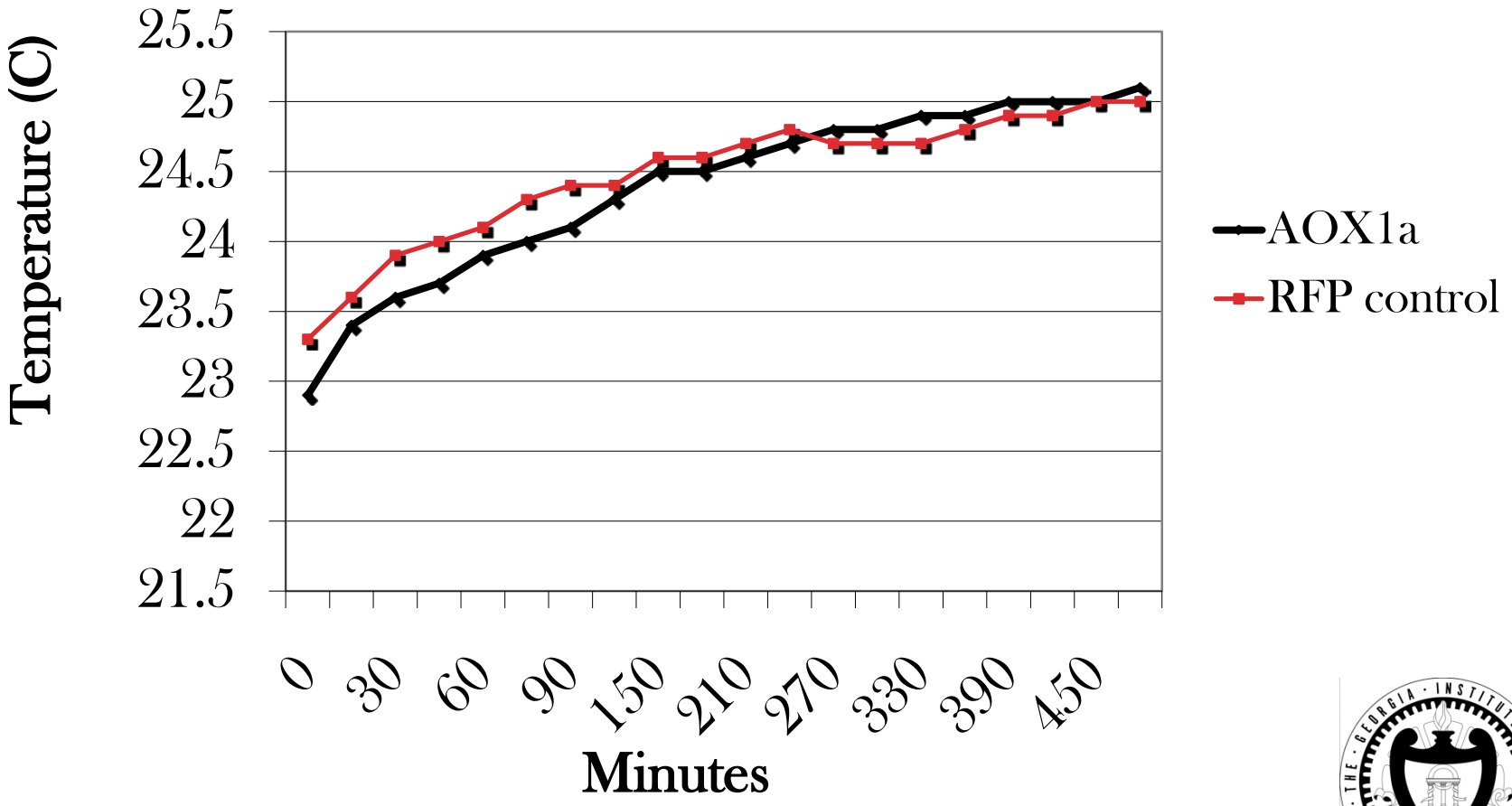


HybB-OmpA-mRFP

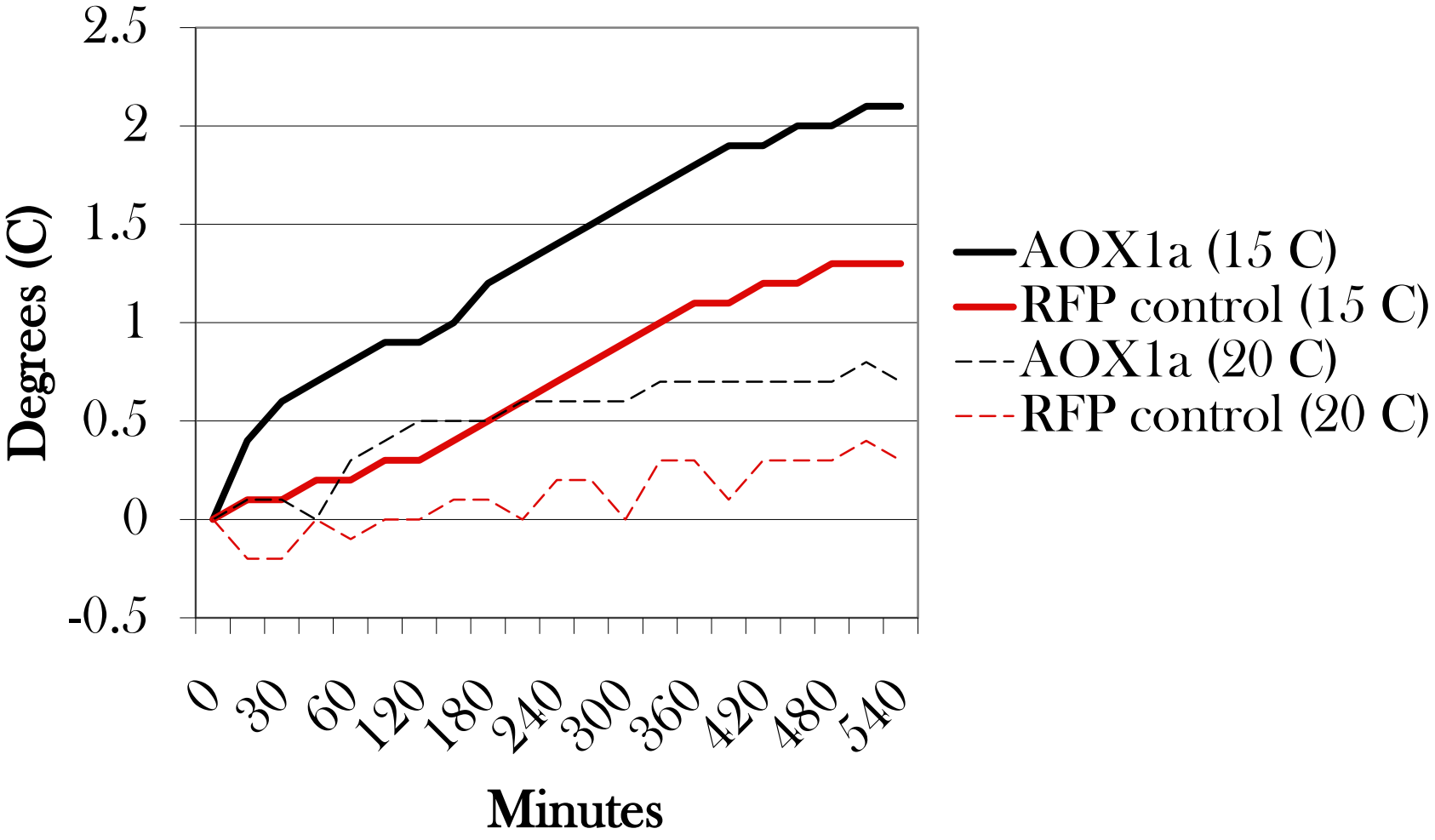
Absolute Temperature by Strain at 15° C



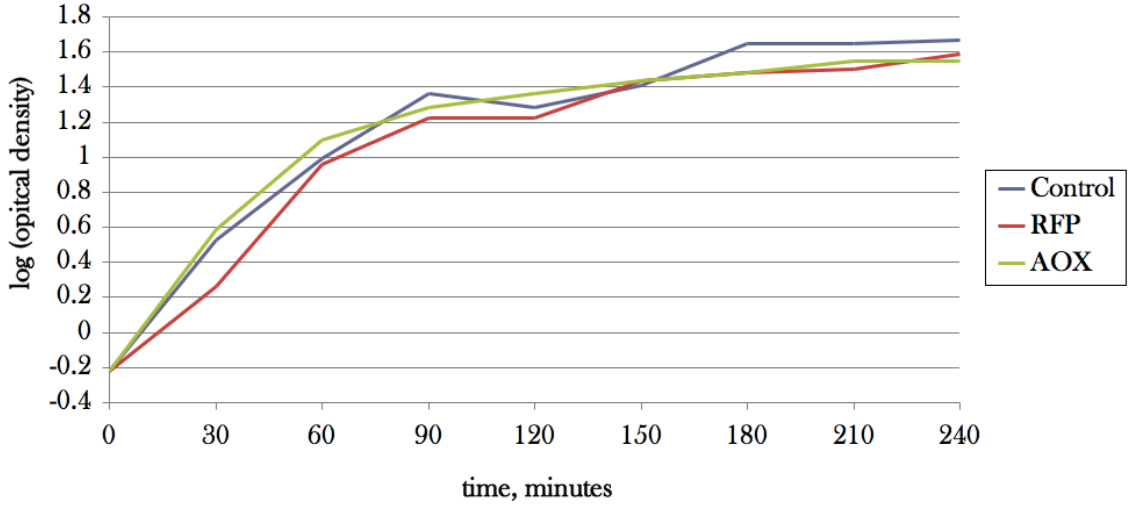
Absolute Temperature by Strain at 25° C



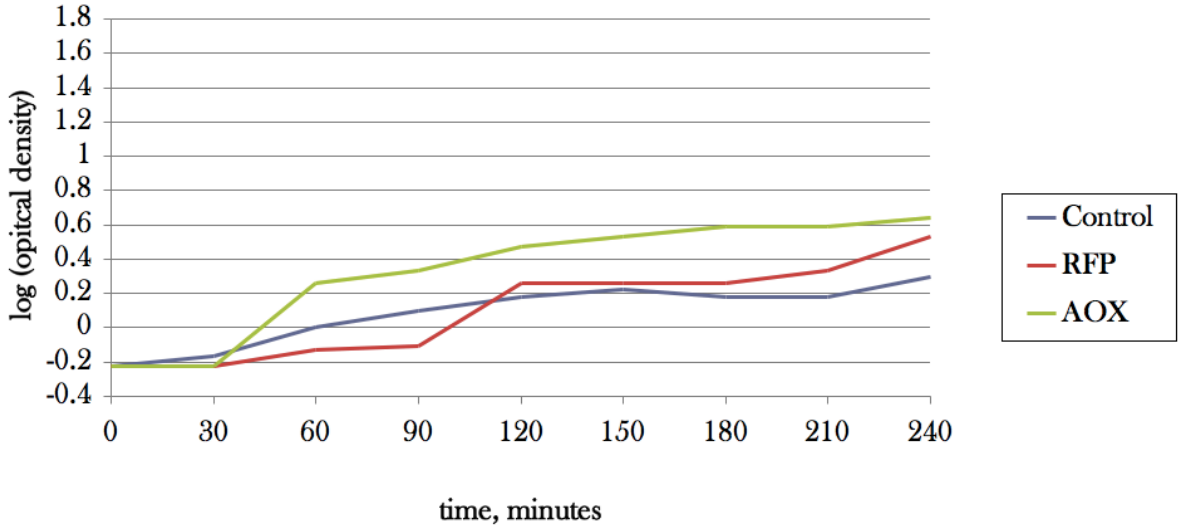
Heat Production Above Baseline After Cold Shock

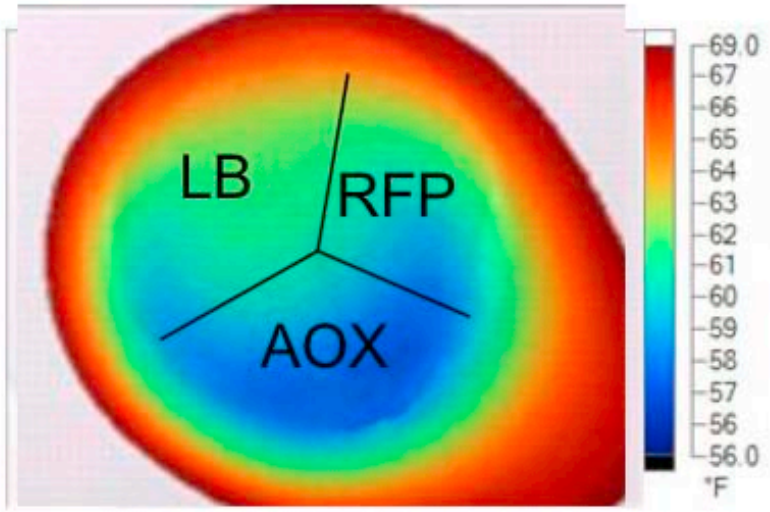


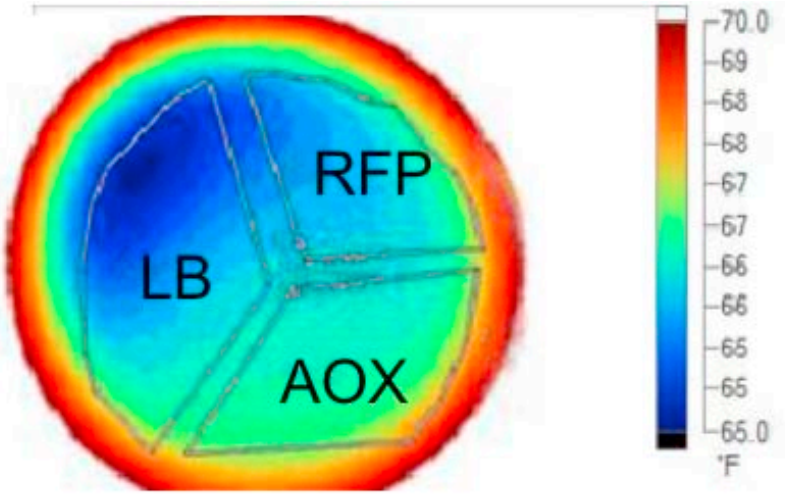
Bacterial Growth at 37° C

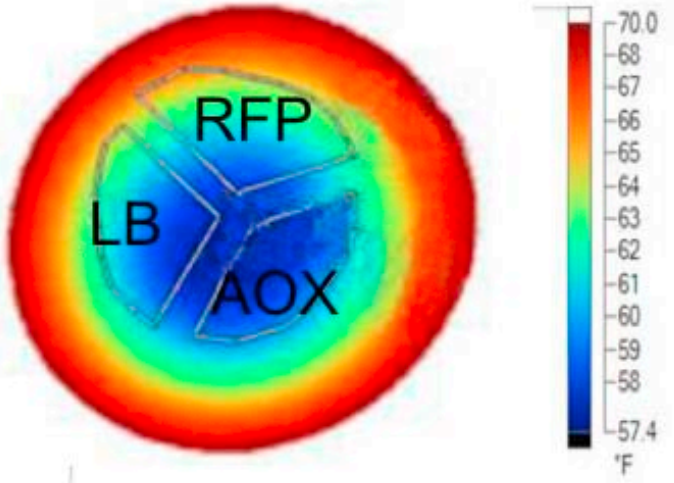


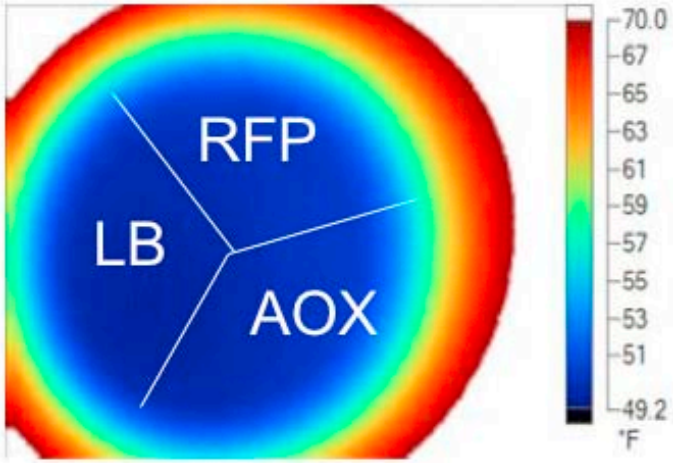
Bacterial Growth at 15° C




LB
RFP
AOX
69.0
67
66
65
64
63
62
61
60
59
58
57
56
56.0
°F


RFP
LB
AOX
70.0
69
68
68
67
67
66
66
65
65
65.0
°F


RFP
LB
AOX
70.0
68
67
66
65
64
63
62
61
60
59
58
57.4
°F

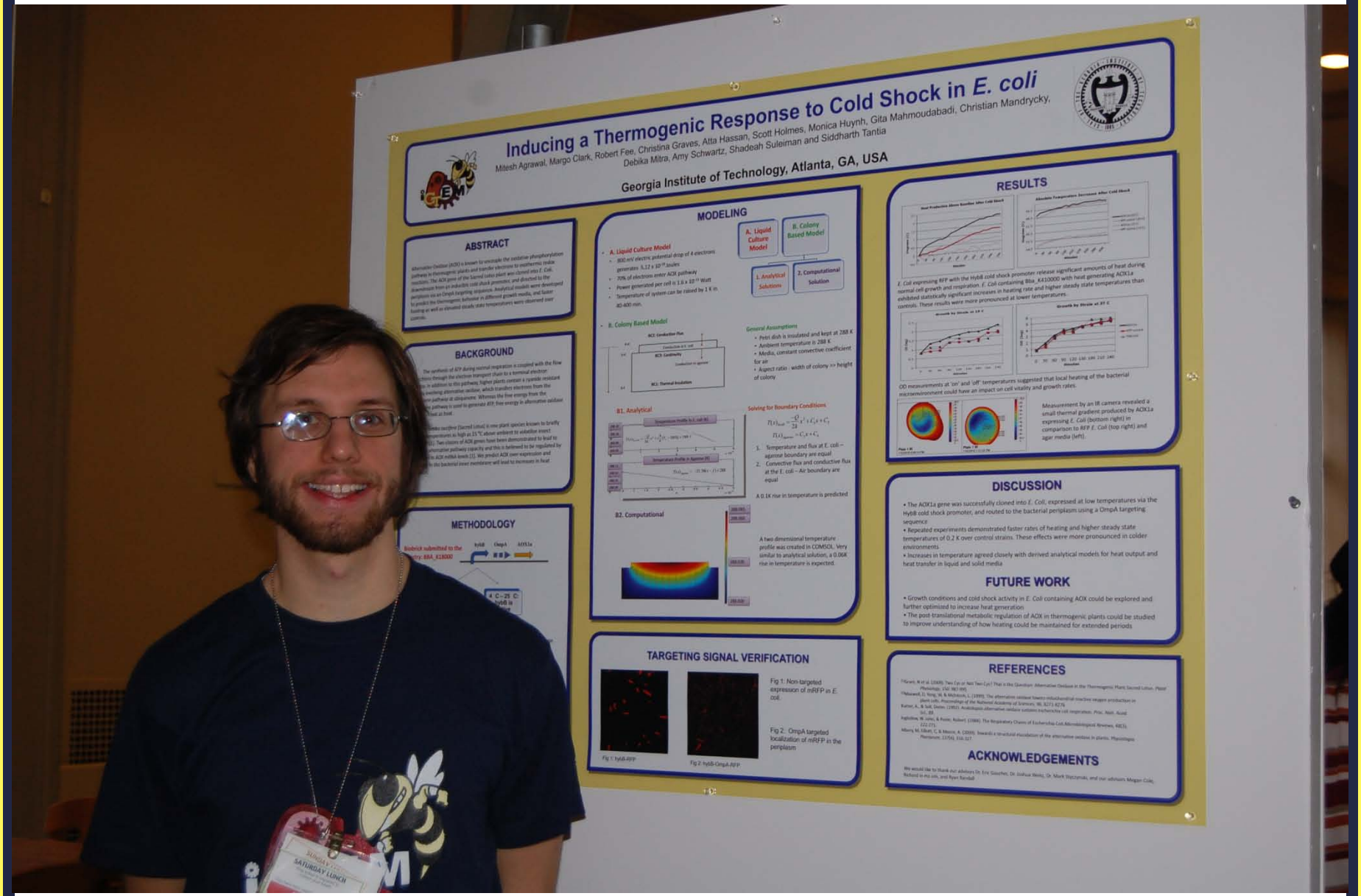

RFP
LB
AOX
70.0
67
65
63
61
59
57
55
53
51
49.2
°F

Conclusion

ments

P


Bacterial Growth at 30° C
Control
RPP
AOX


Inducing a Thermogenic Response to Cold Shock in E. coli
Mitesh Agrawal, Margo Clark, Robert Fee, Christina Graves, Atta Hassan, Scott Holmes, Monica Huynh, Gita Mahmoudabadi, Christian Mandrycky, Debika Mitra, Amy Schwartz, Shadeah Suleiman and Siddharth Tantia
Georgia Institute of Technology, Atlanta, GA, USA
ABSTRACT
BACKGROUND
METHODOLOGY
MODELING
A. Liquid Culture Model
B. Colony Based Model
1. Analytical Solutions
2. Computational Solution
General Assumptions
Solving for Boundary Conditions
B1. Analytical
B2. Computational
TARGETING SIGNAL VERIFICATION
Fig 1: Non-targeted expression of mRFP in E. coli.
Fig 2: OmpA targeted localization of mRFP in the periplasm
RESULTS
DISCUSSION
FUTURE WORK
REFERENCES
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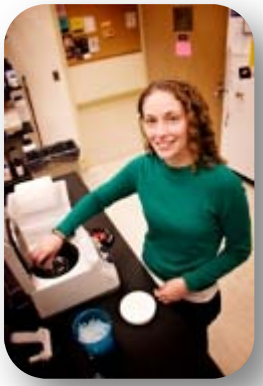
Below: Richard Joh, Scott Holmes, Christian Mandrycky, Sid Tantia, Mitesh Agrawal, Rob Fee, Dr. Mark Styczynski, Shadeah Suleiman, Amy Schwartz, Debika Mitra, Atta Hassan, Monica Huynh, Margo Clark, Christina Graves, Gita Mahmoudabadi [not pictured]



Dr. Megan Cole

Richard Joh