Comparative Analyses of DNA Methylation Patterns in Bivalves

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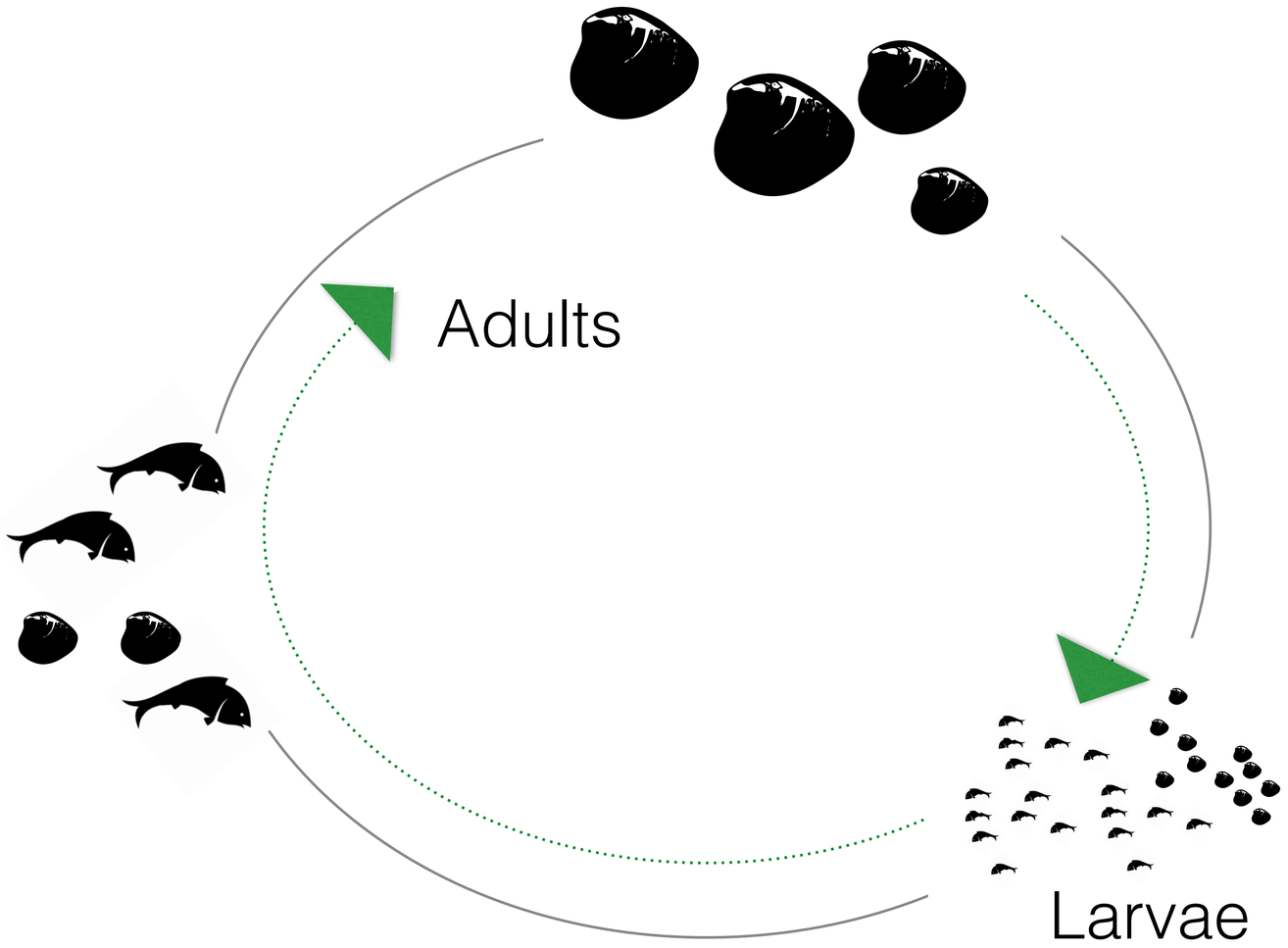
@sr320

KEY MECHANISMS OF ACCLIMATIZATION AND ADAPTATION TO GLOBAL OCEAN CHANGE



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2) **How do environmental conditions influence epigenetic variation?**

3) **To what degree is epigenetic variation heritable?**

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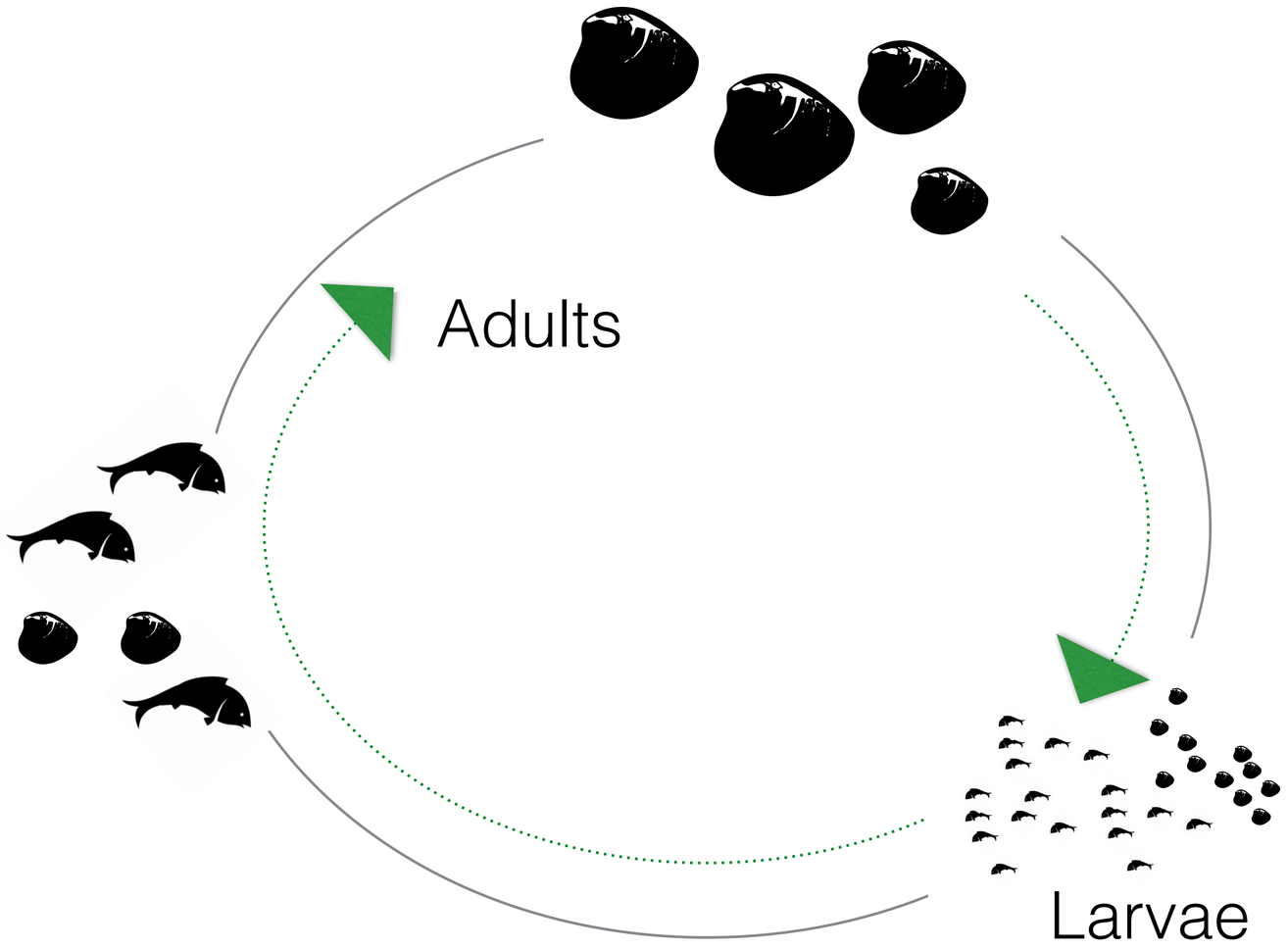

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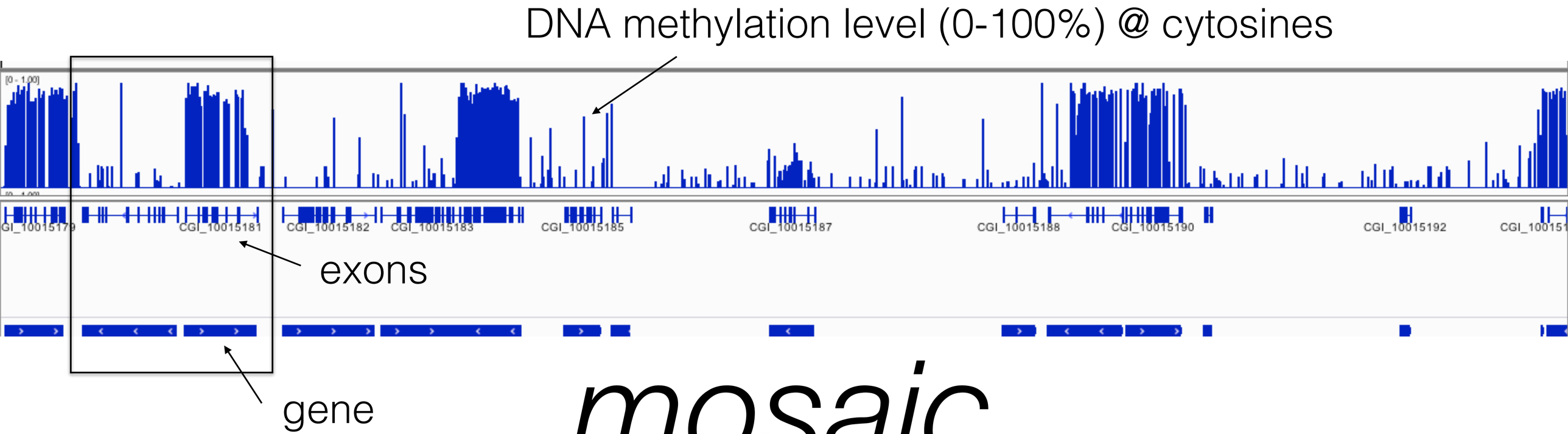
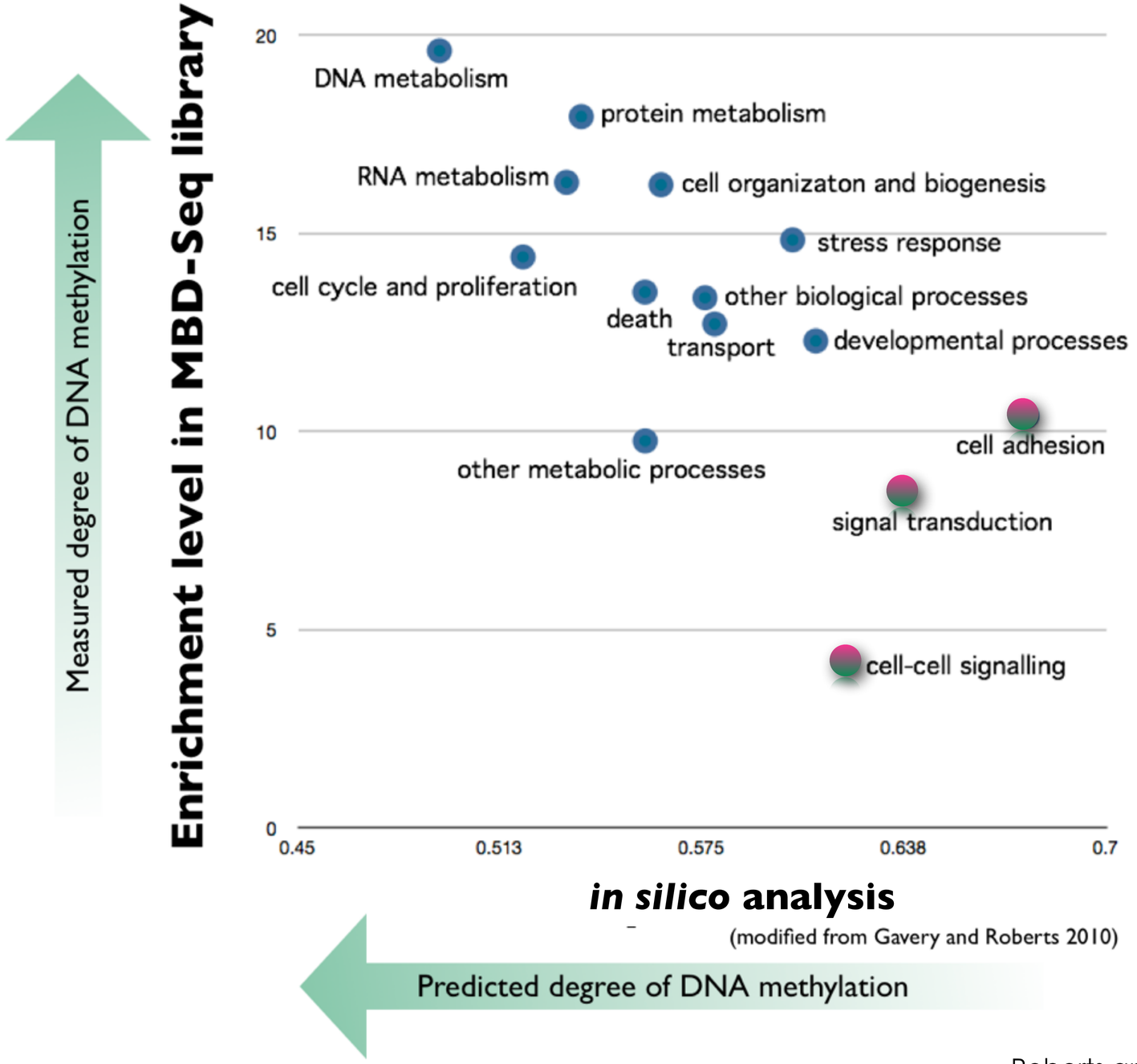


mosaic

associated with gene bodies

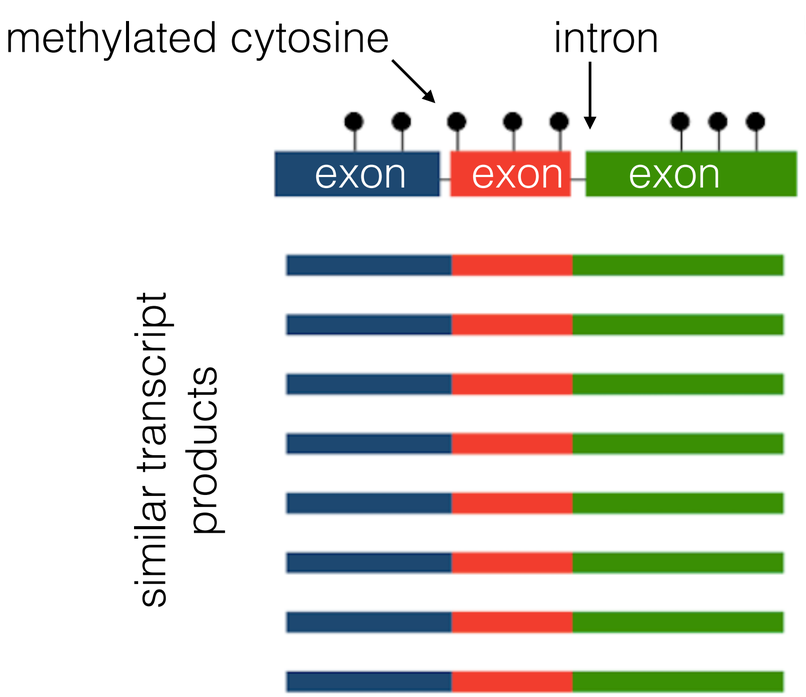
Methylation landscape

Why are only a subset of genes methylated?

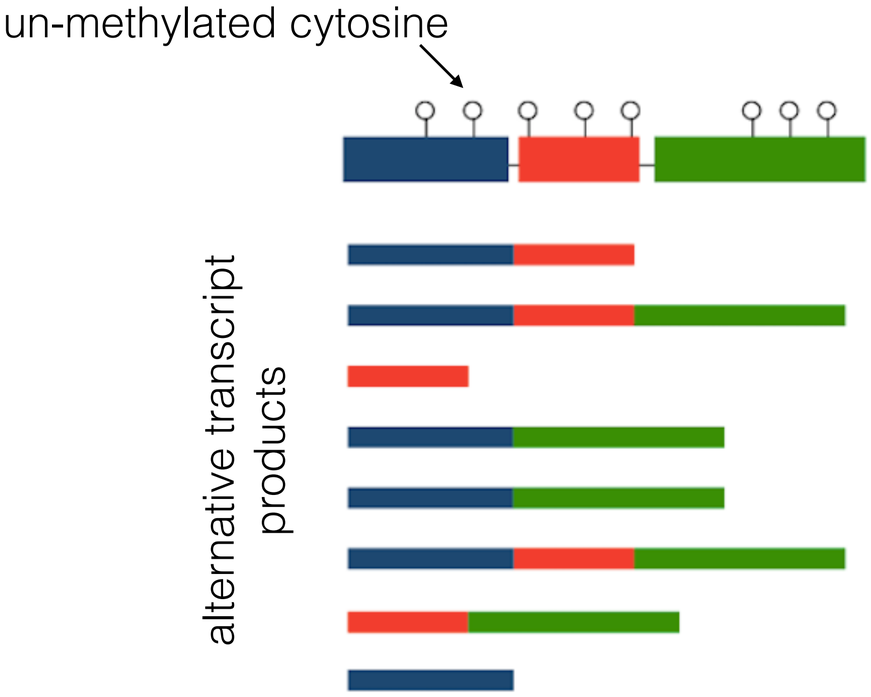


Methylation landscape

Roberts and Gavery 2012



housekeeping



response to change

BRIEFINGS IN FUNCTIONAL GENOMICS. VOL 13. NO 3. 217–222

A context dependent role for DNA methylation in bivalves

Mackenzie R. Gavery and Steven B. Roberts

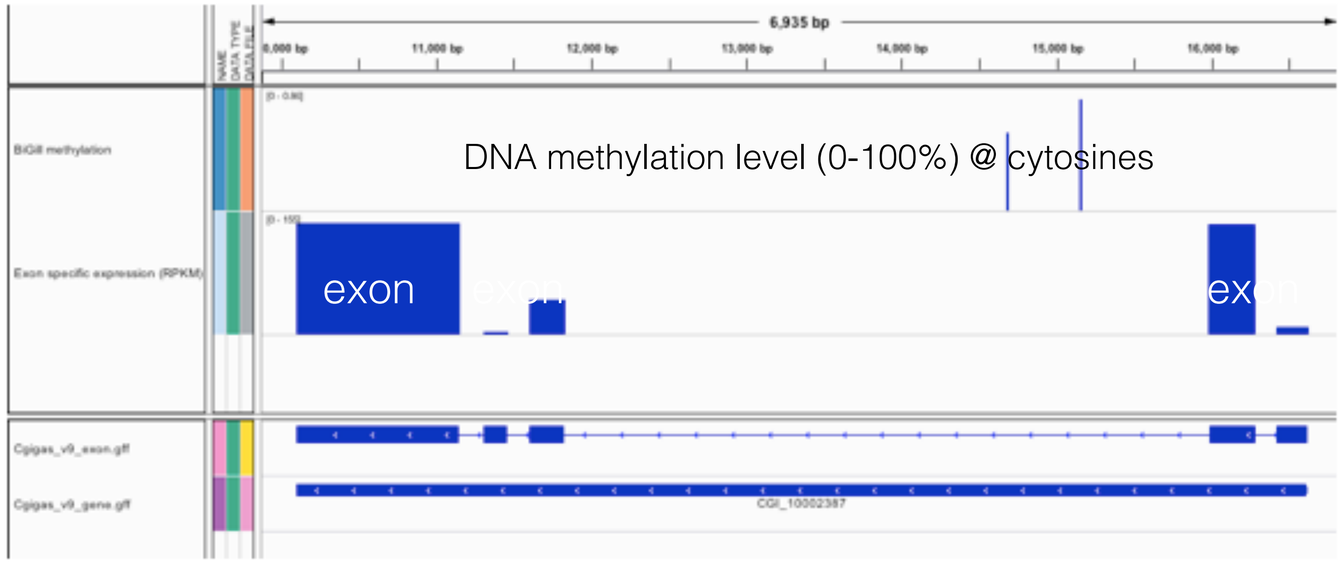
Advance Access publication date 7 January 2014

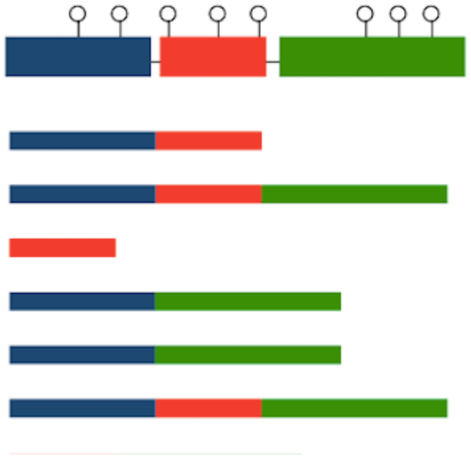
Could STOCHASTIC VARIATION contribute to ACCLIMATIZATION and ADAPTATION?

Heat shock 70 kDa protein 12A

avg exp
199

%meth
2%

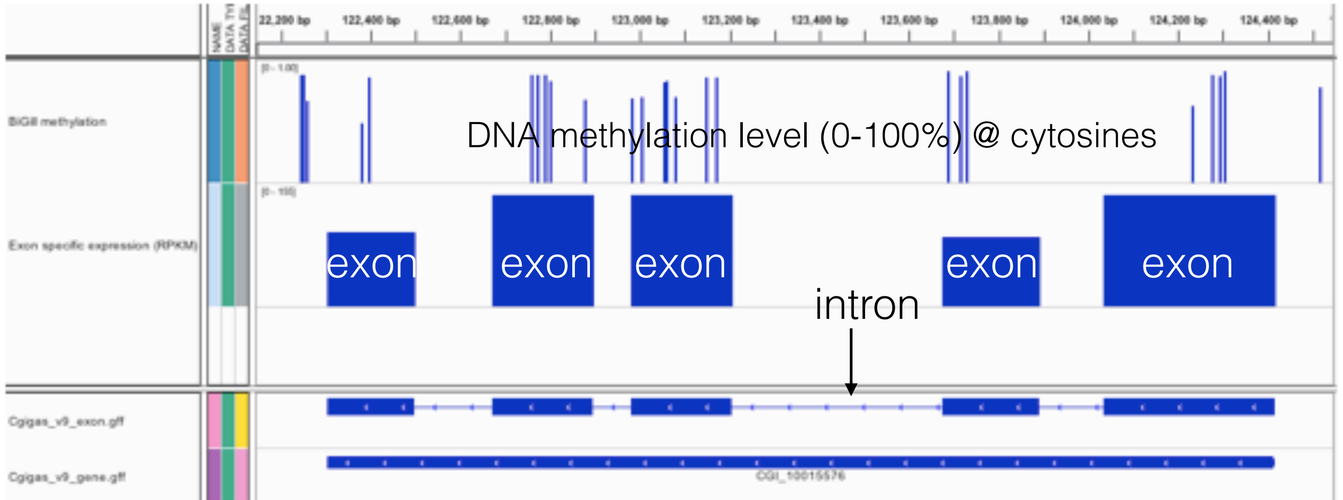


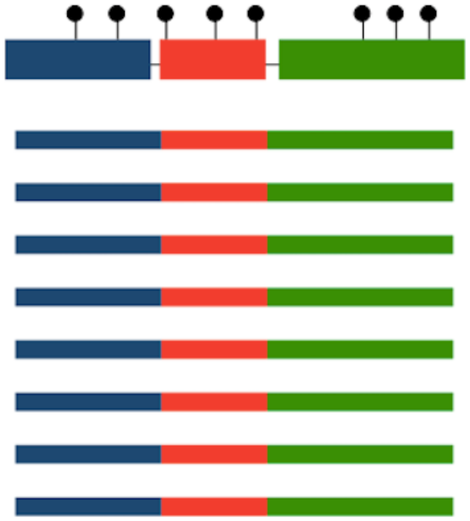


Tektin-2

avg exp
197

%meth
91%





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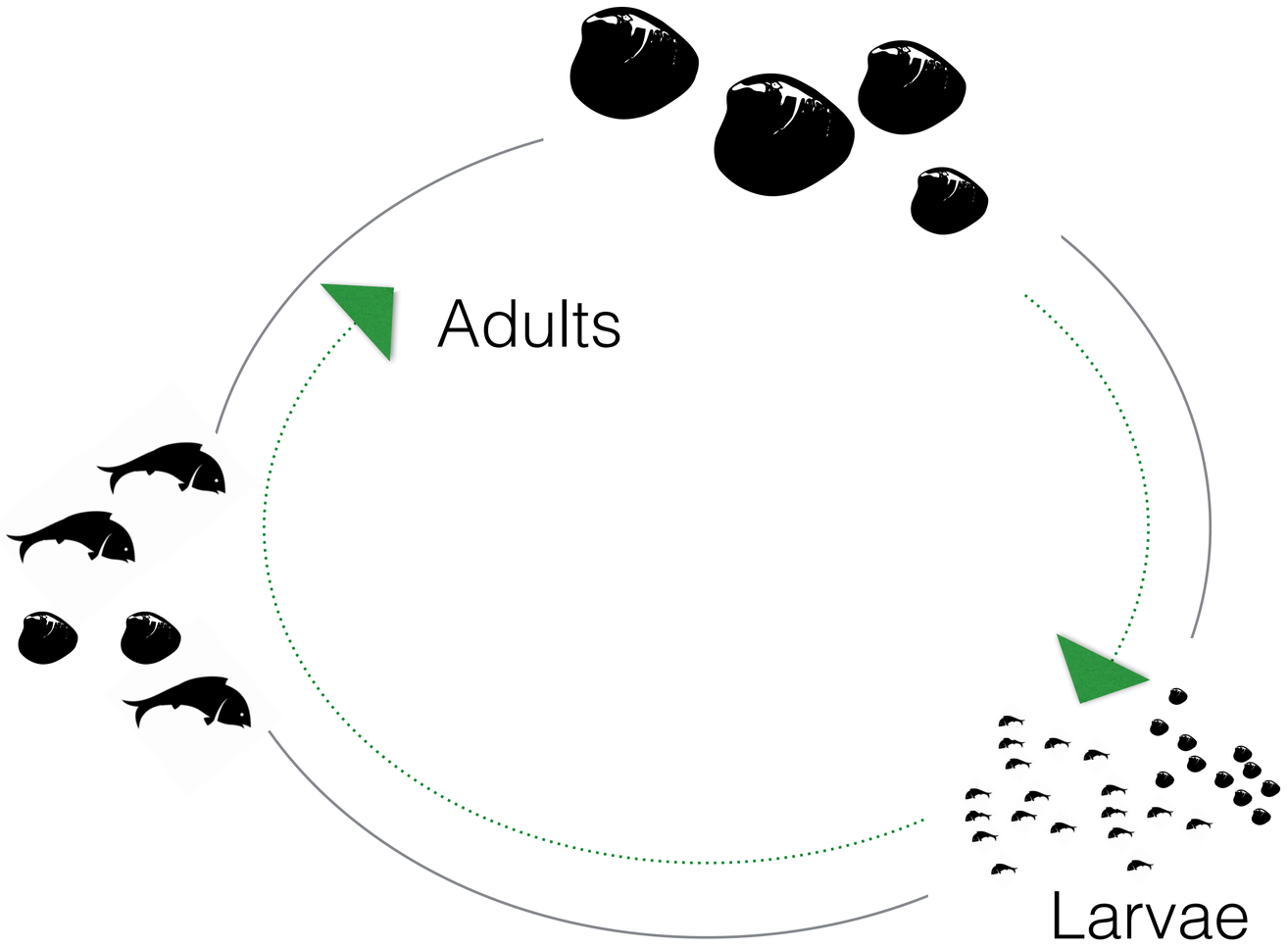

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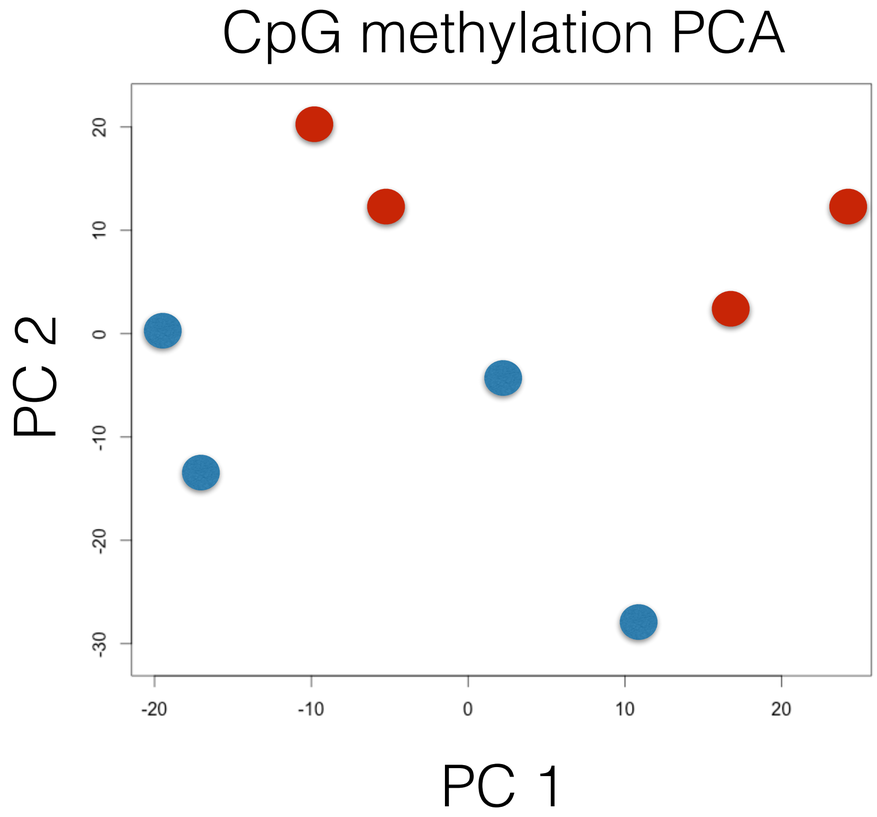
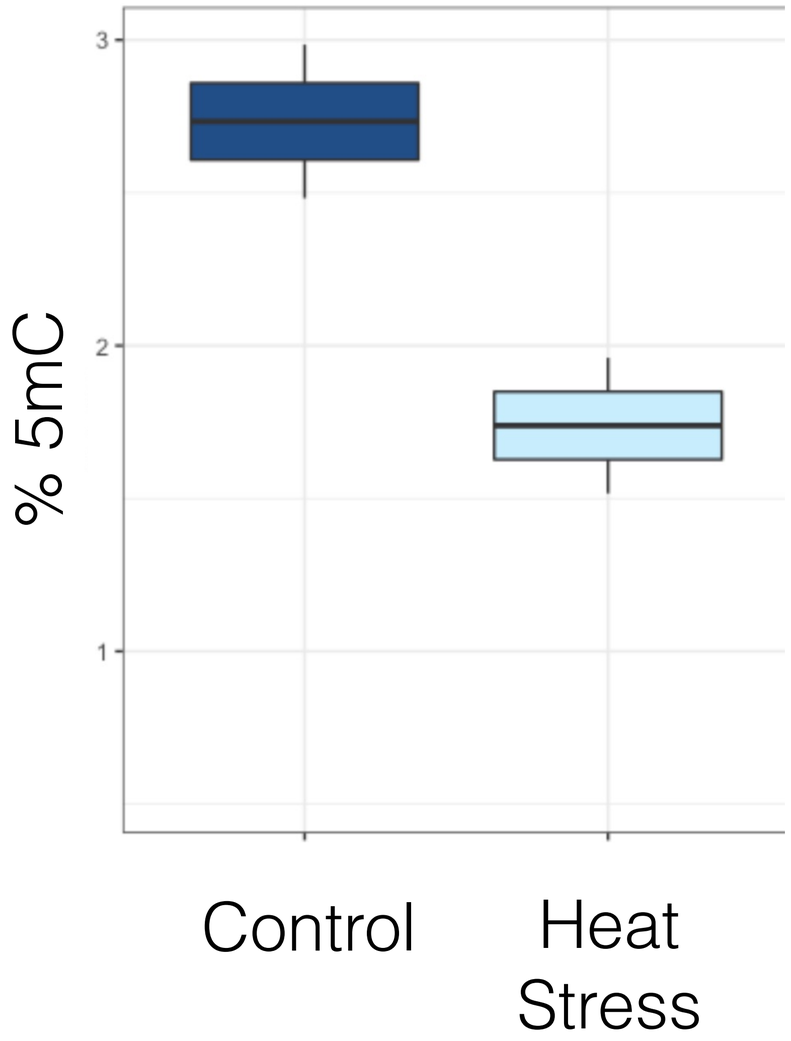
Local Environmental Differences Influence DNA Methylation Patterns



MBD-BS Sequencing

Temperature and Desiccation Decreases Global DNA Methylation

DNA Methylation ELISA



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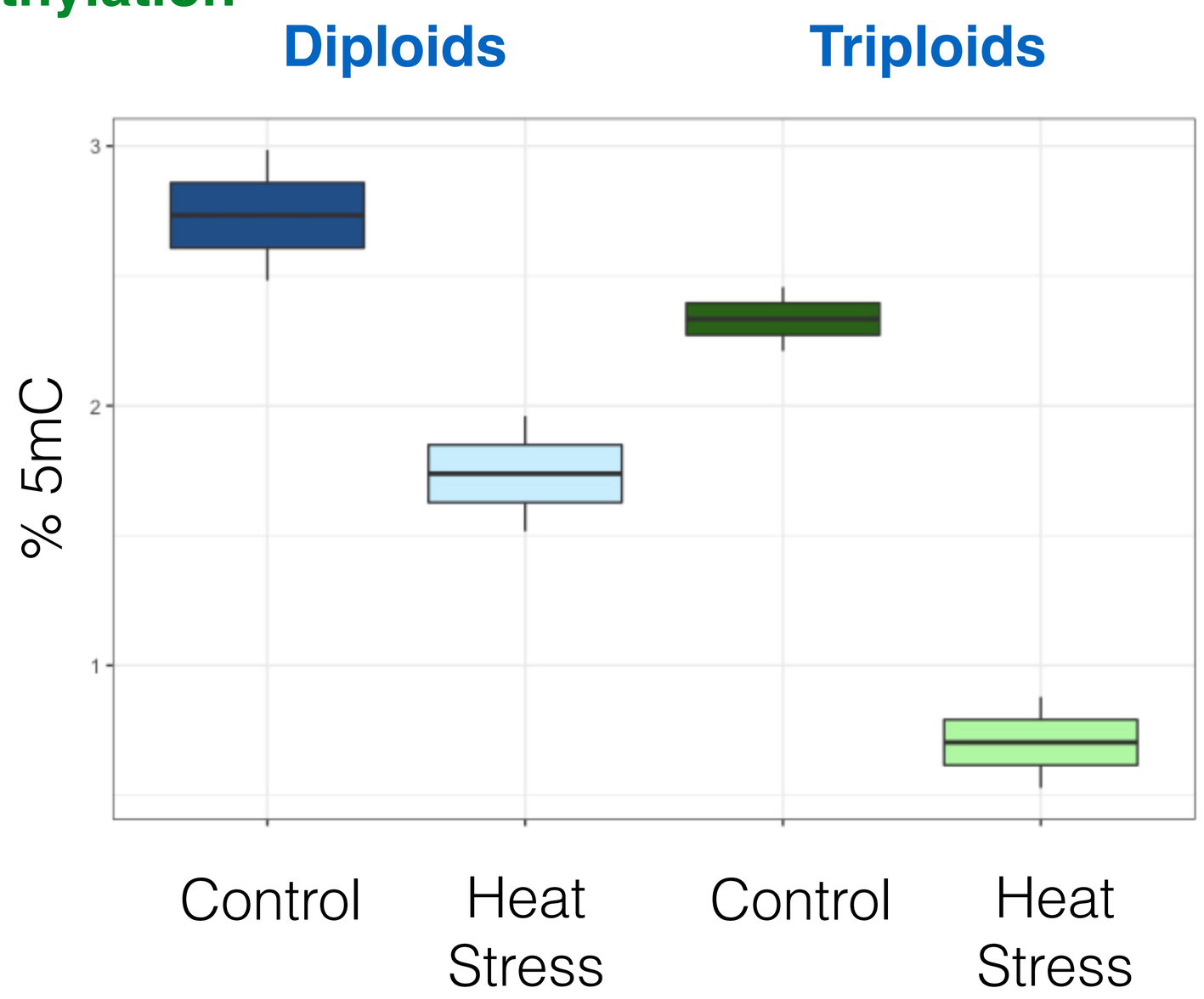
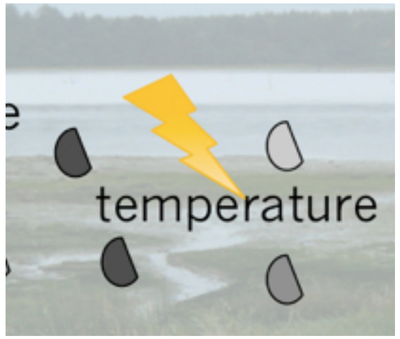


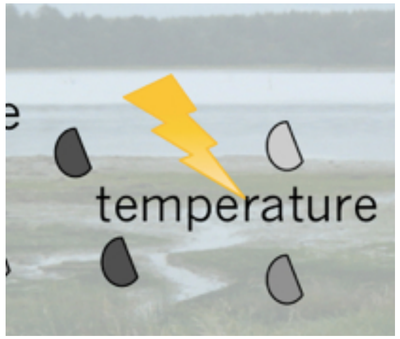
Temperature Alters CpG Methylation

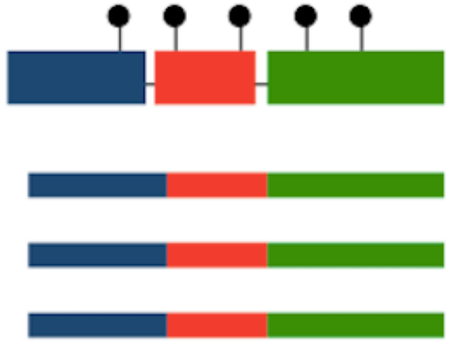


Oyster	Hypo-methylated	Hyper-methylated
2	7224	2803
4	6560	3587
6	7645	4044

MBD-Array

Temperature Alters CpG Methylation





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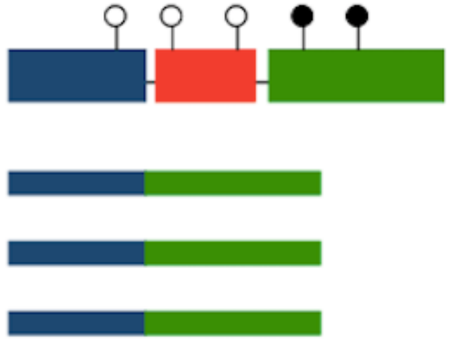

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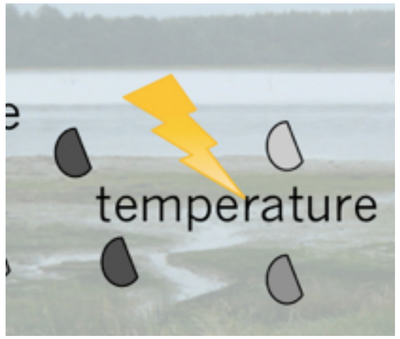

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No obvious association with genome feature including *differentially expressed genes*

MBD-Array

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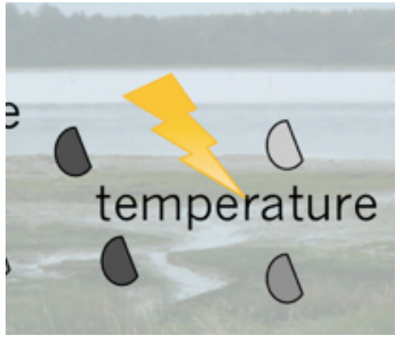
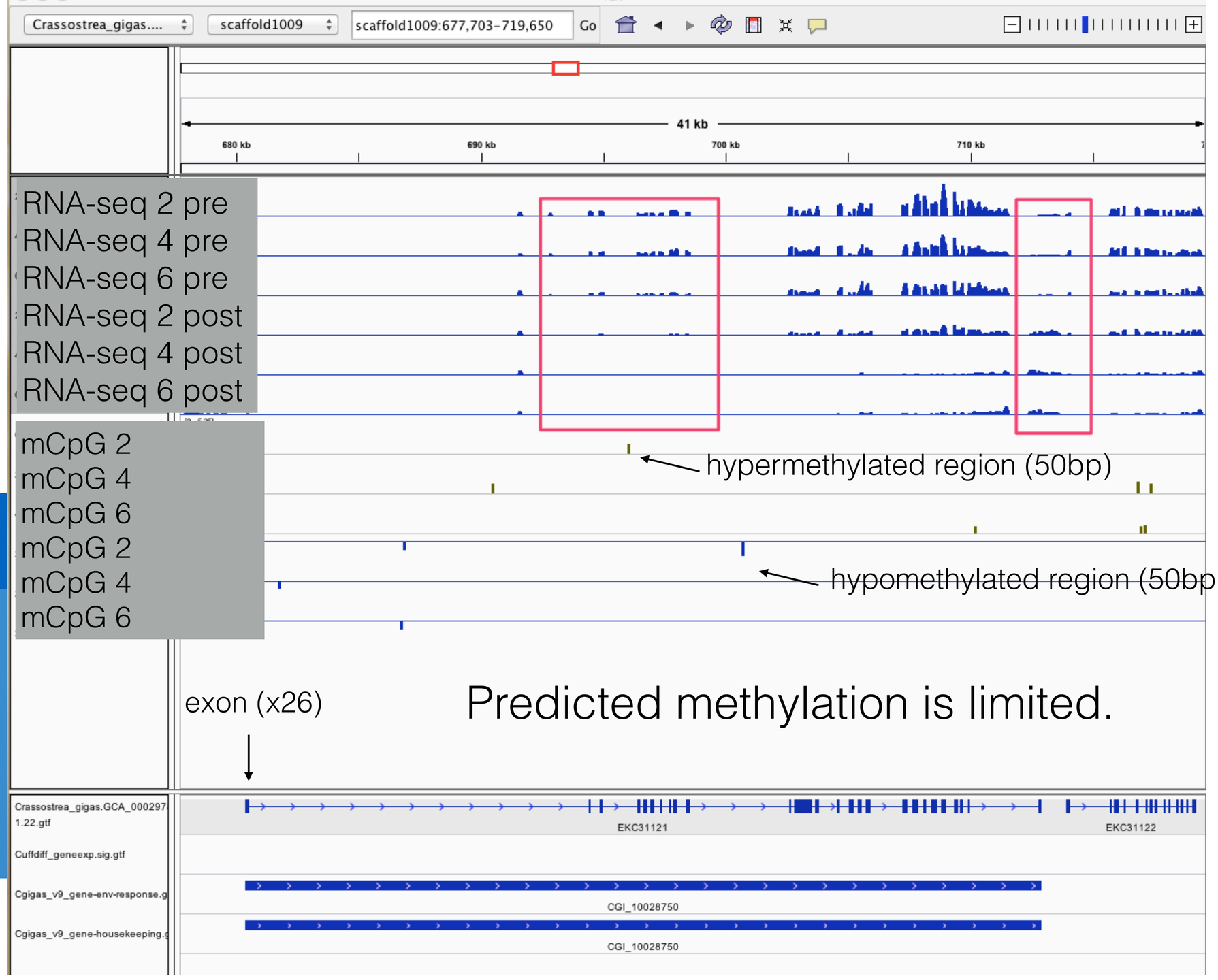


Oyster
2
4
6

MBD-Array



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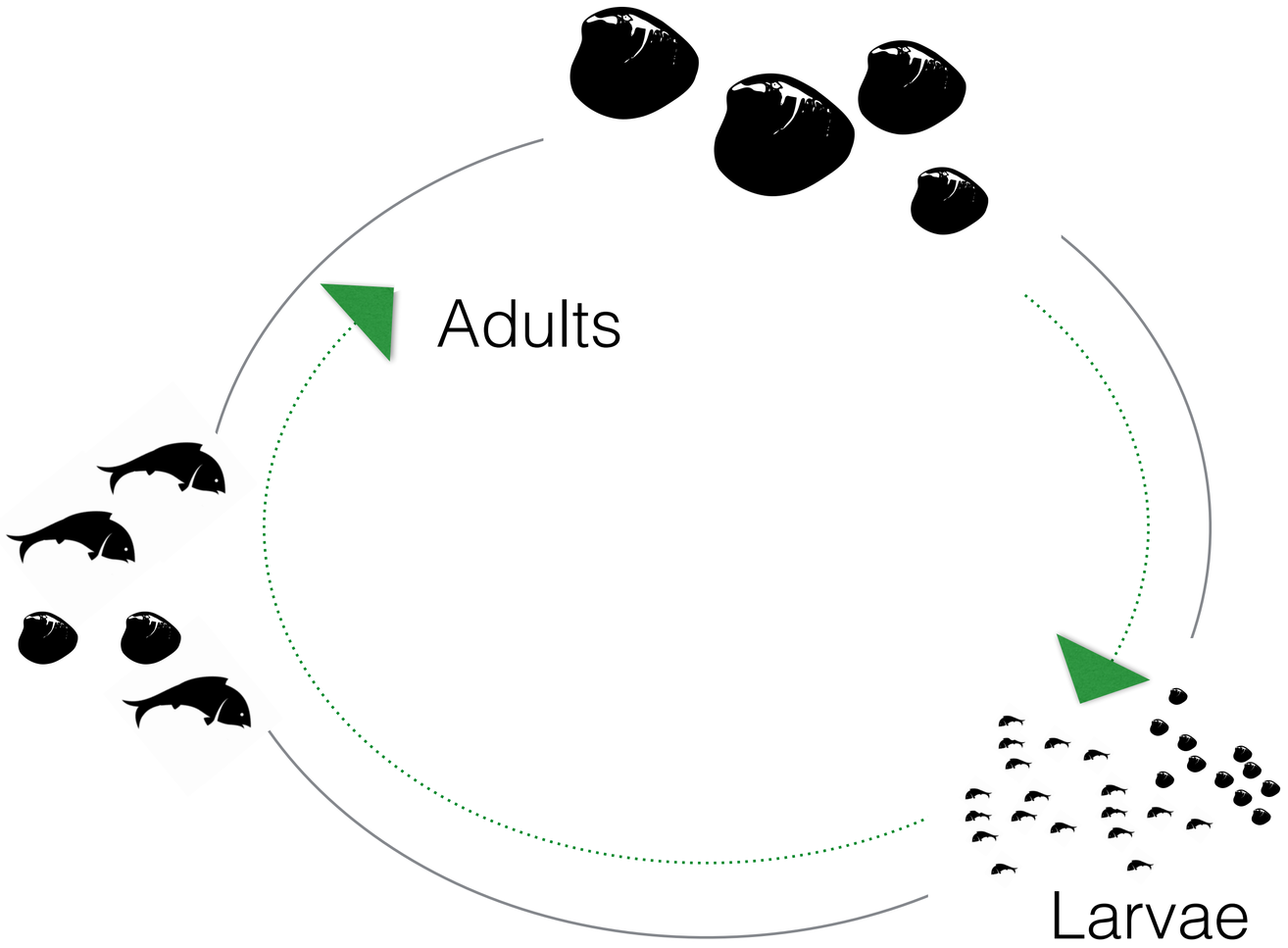

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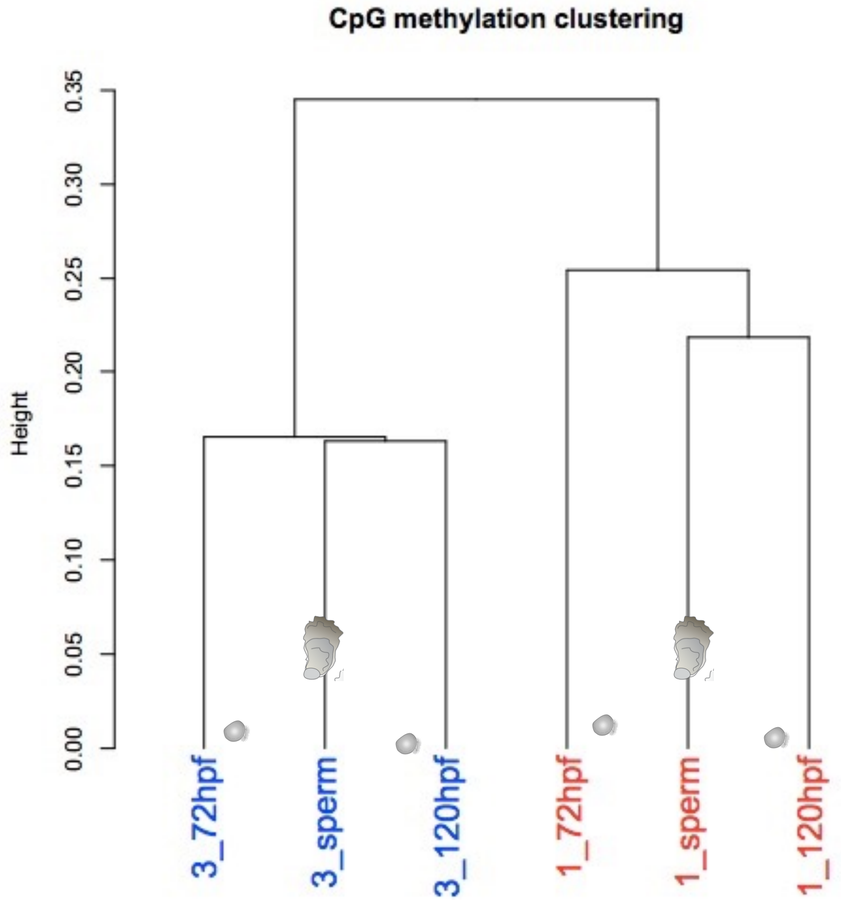
Family Specific DNA Methylation Patterns Exist



Cold Spring Harbor Laboratory

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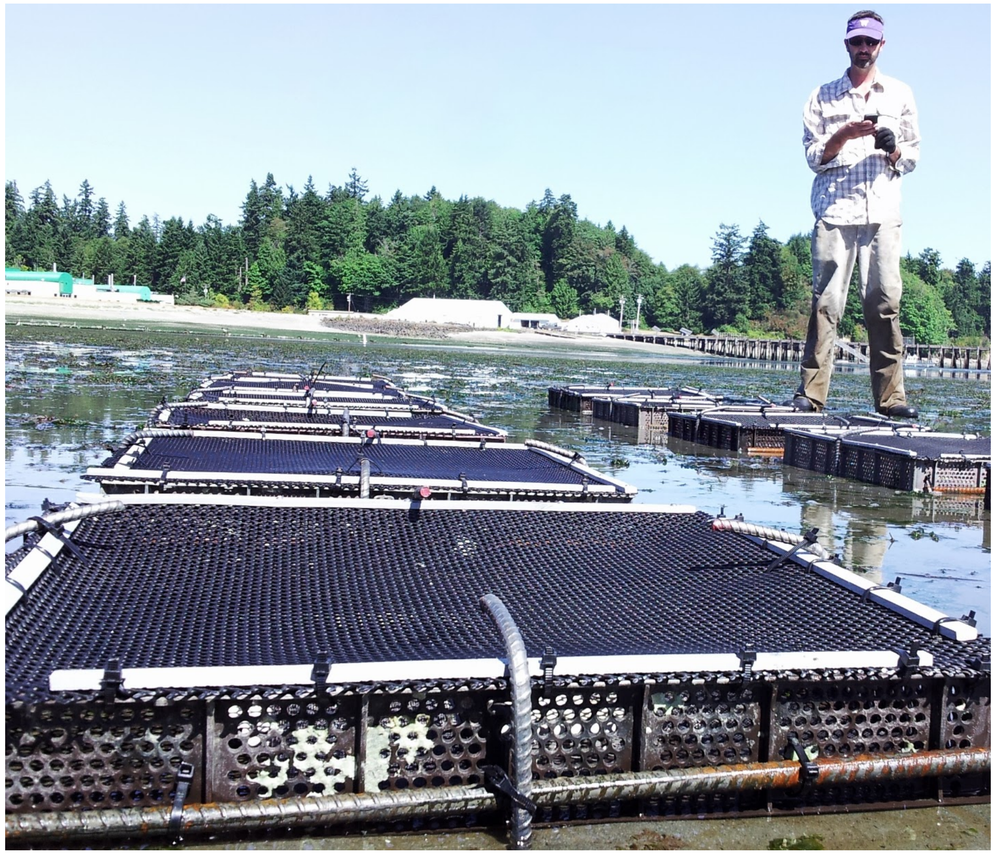
New Results

Indication of family-specific DNA methylation patterns in developing oysters

Claire E. Olson , Steven B. Roberts

doi: http://dx.doi.org/10.1101/012831

Population DNA Methylation Patterns Persist in Transplant Experiment



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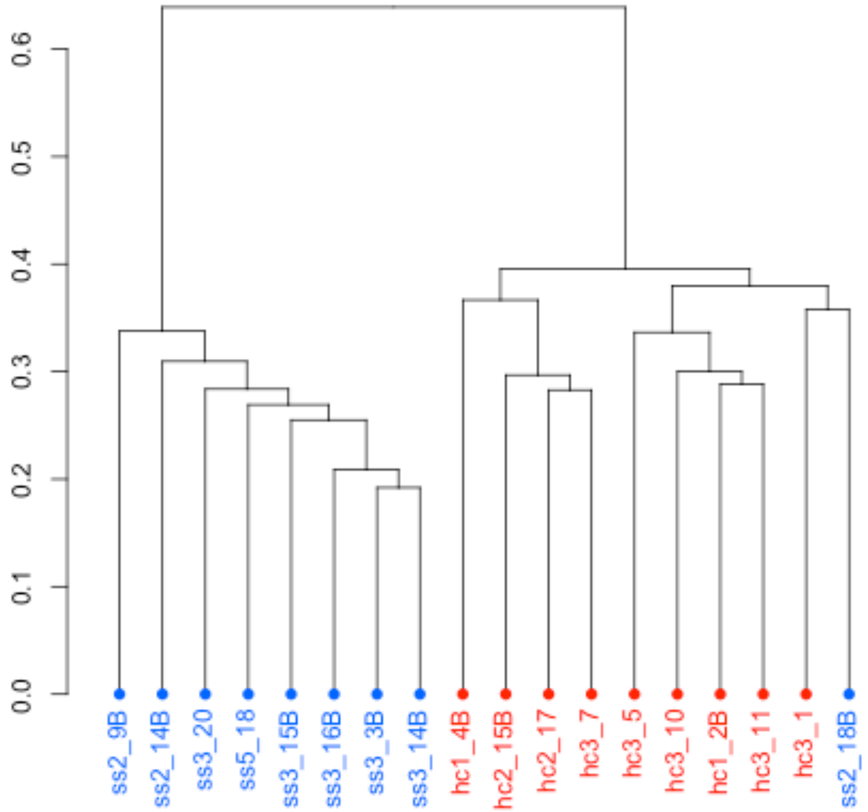
CpG methylation clustering



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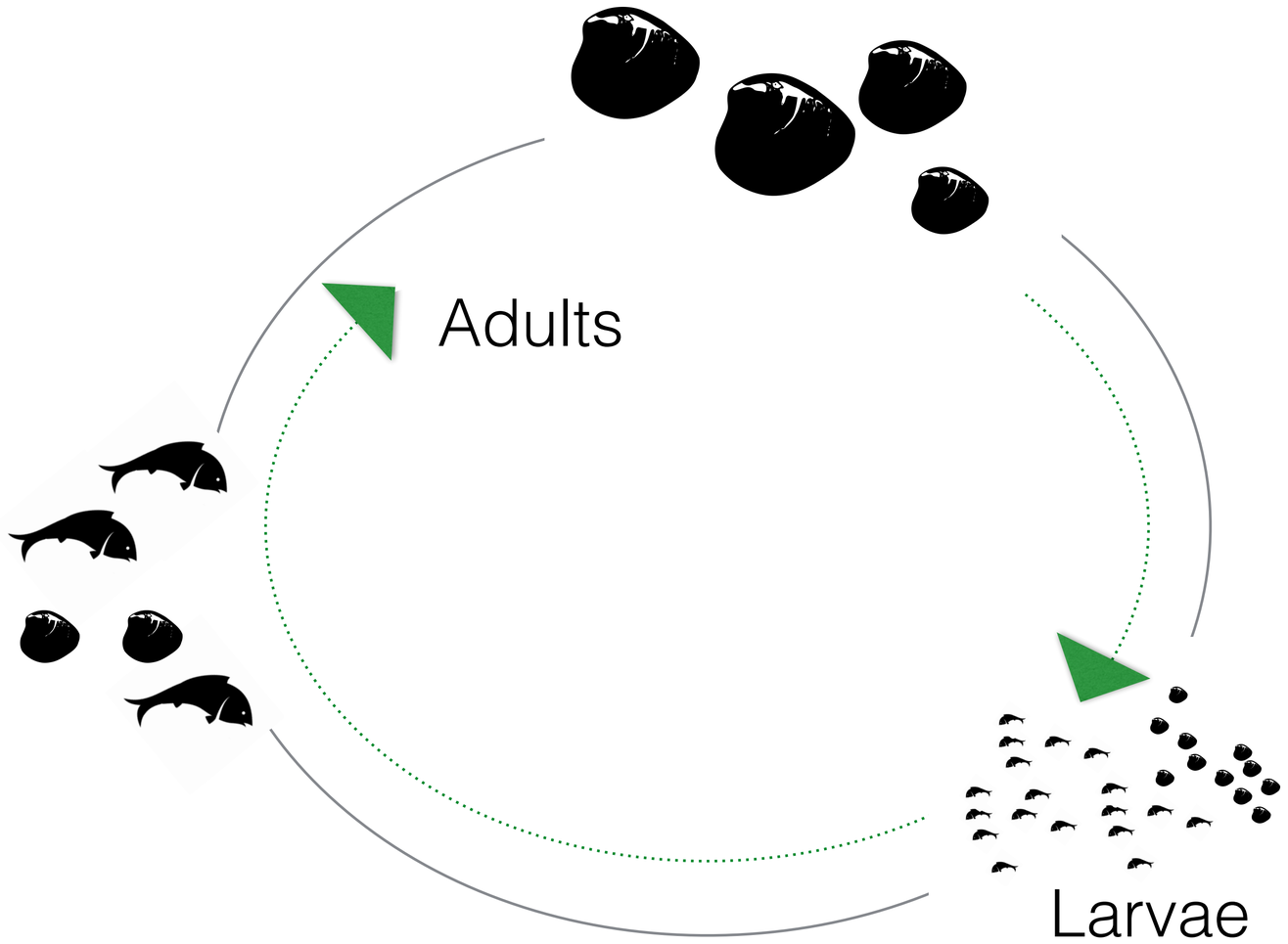

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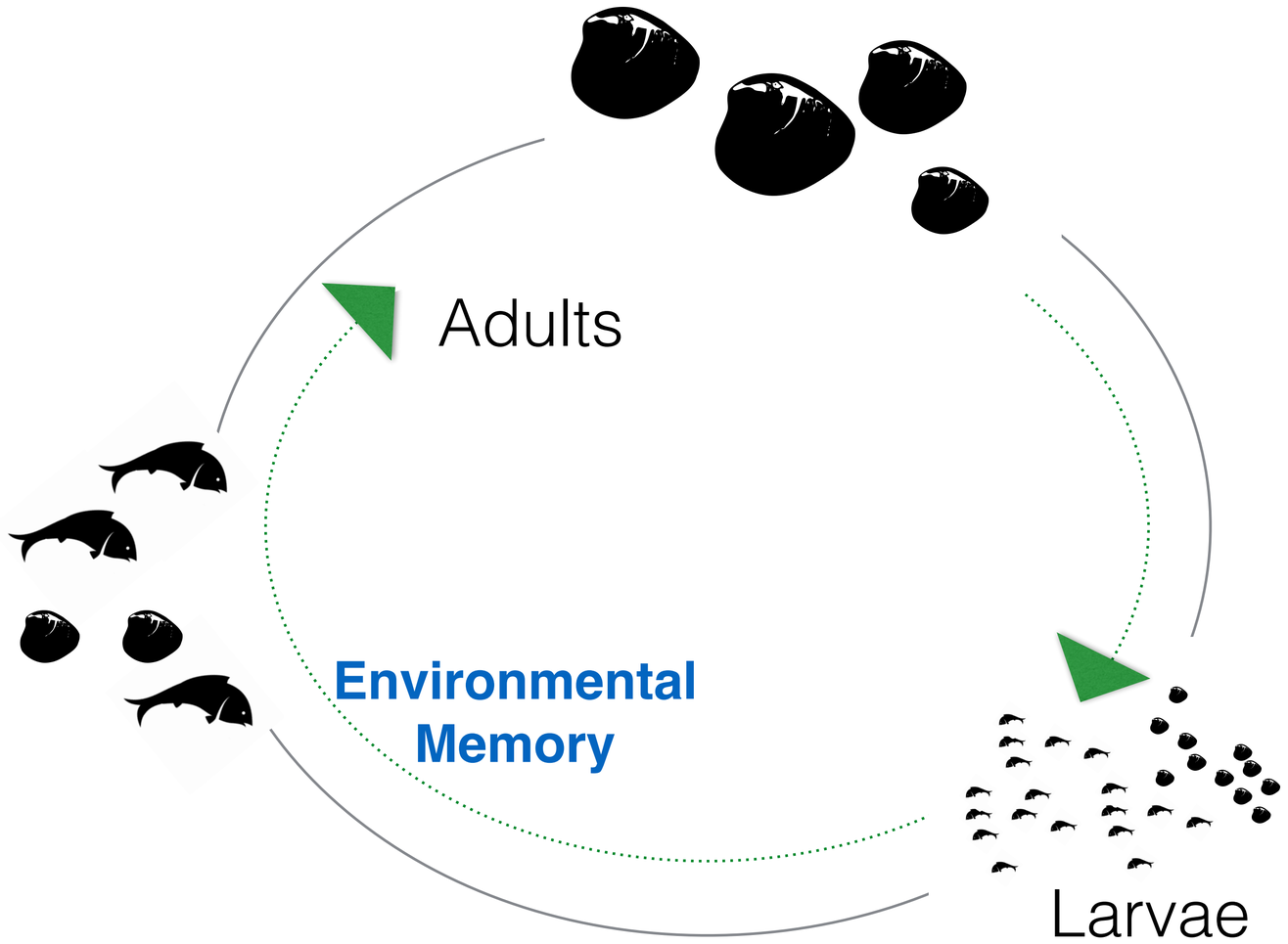

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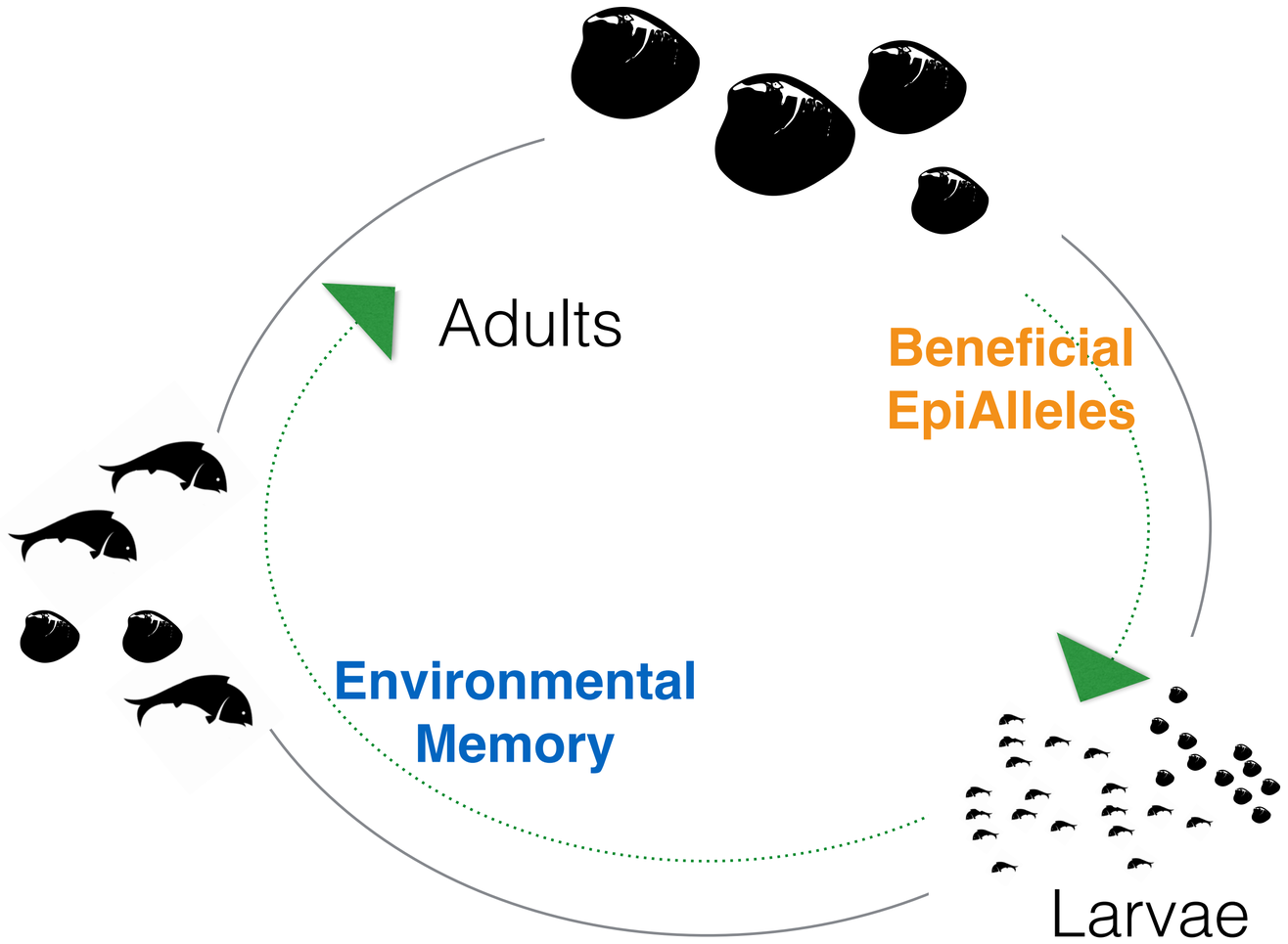

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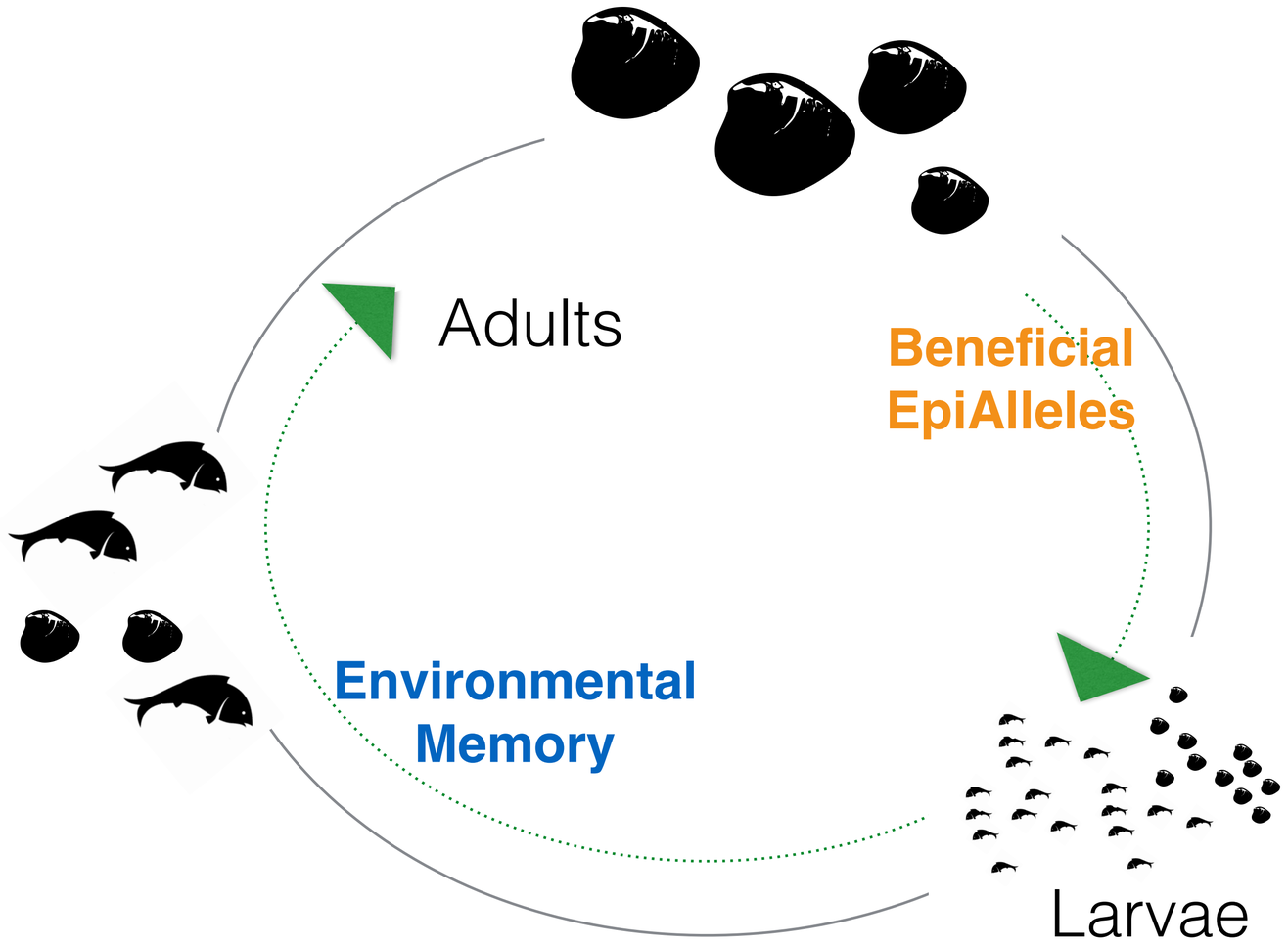

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Increased phenotypes via sparse methylation

Acknowledgements

Mackenzie Gavery
Claire Olson
Sam White
Brent Vadopalas
Hollie Putnam
Shelly Trigg
Yaamini Venkataraman
Katherine Silliman
Jay Dimond
Laura Spencer

slides & more @

https://github.com/sr320/talk-ALSO-2019