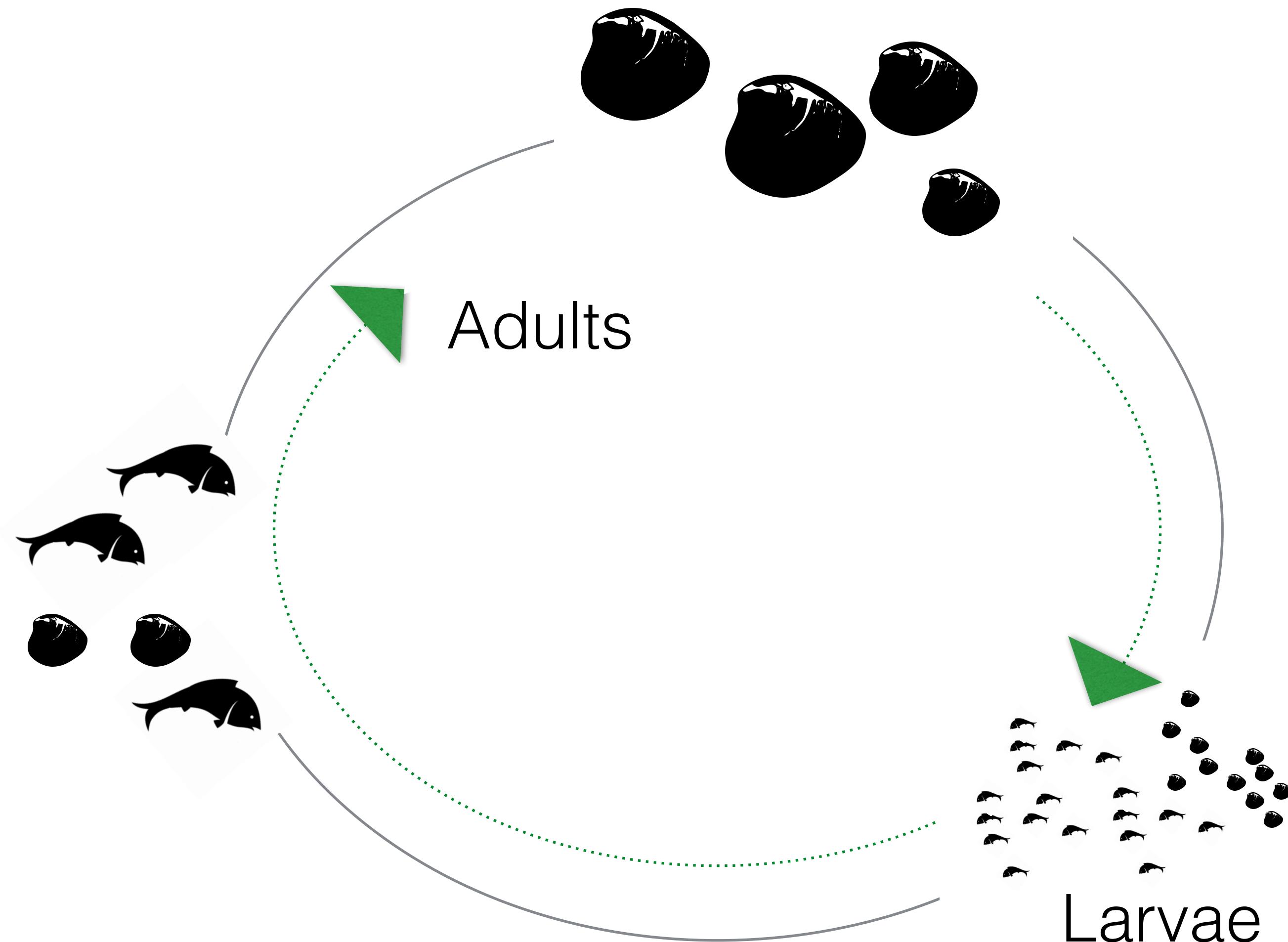
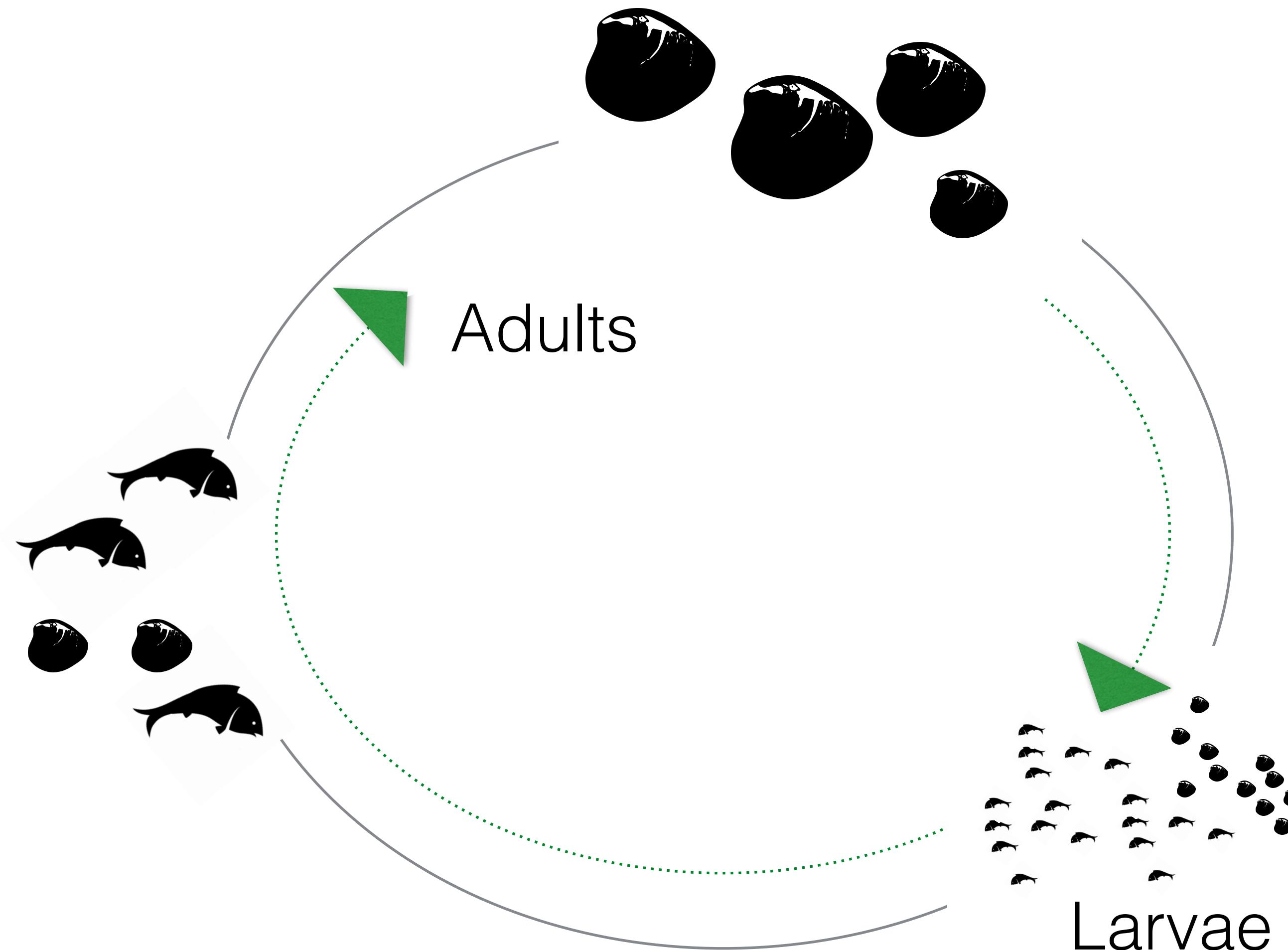


KEY MECHANISMS OF ACCLIMATIZATION AND ADAPTATION TO GLOBAL OCEAN CHANGE



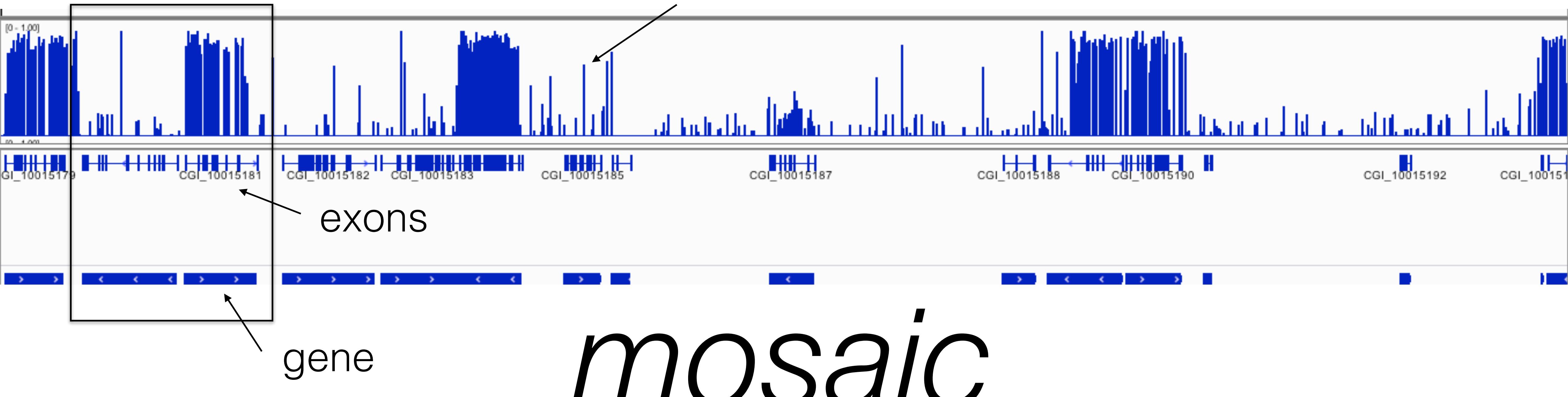
- 1) What is the function of DNA methylation in marine invertebrates?**
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- 3) To what degree is epigenetic variation heritable?**

KEY MECHANISMS OF ACCLIMATIZATION AND ADAPTATION TO GLOBAL OCEAN CHANGE



- 1) **What is the function of DNA methylation in marine invertebrates?**
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DNA methylation level (0-100%) @ cytosines

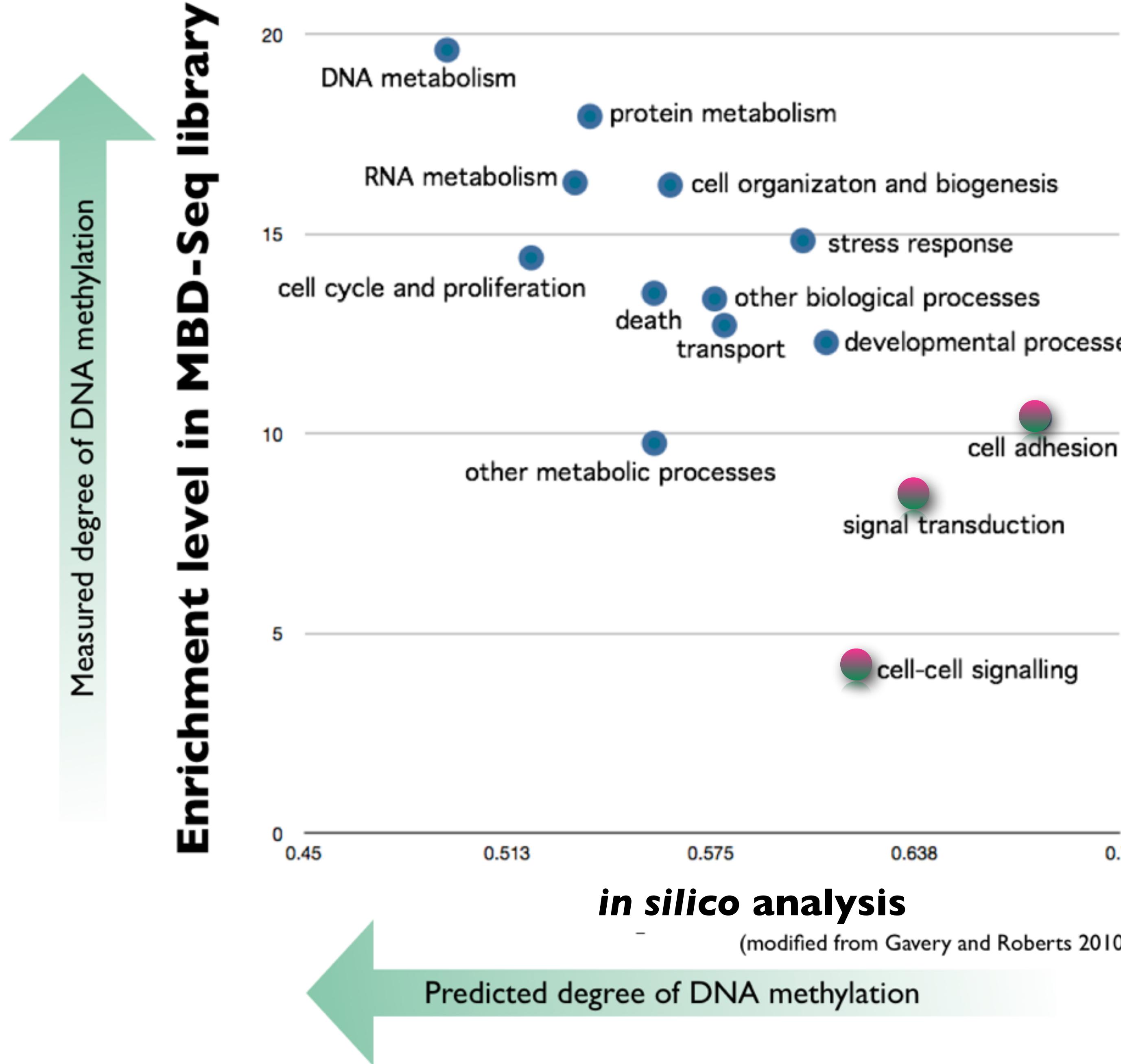


associated with gene bodies

*Methylation
landscape*

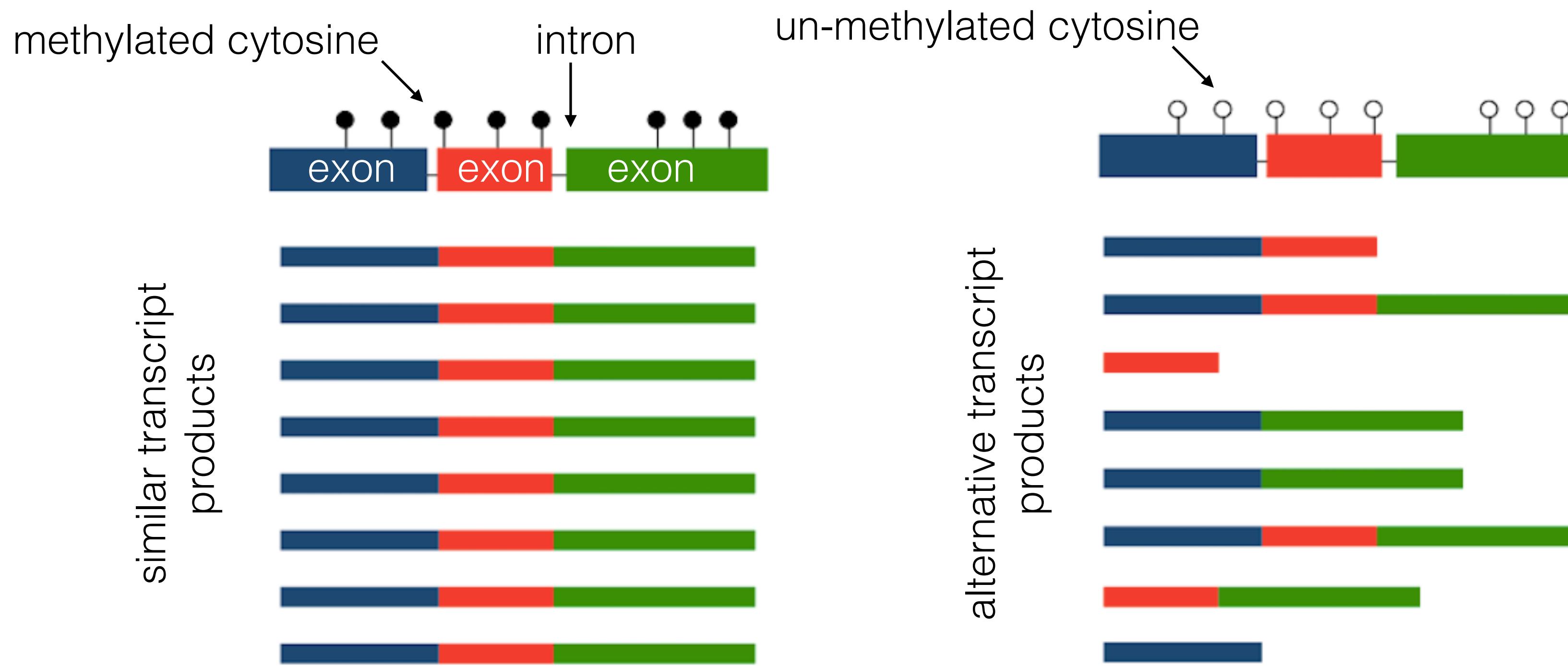
Why are only a subset of genes methylated?

Methylation landscape



Roberts and Gavery 2012

Could STOCHASTIC VARIATION contribute to ACCLIMATIZATION and ADAPTATION?



housekeeping

response to
change

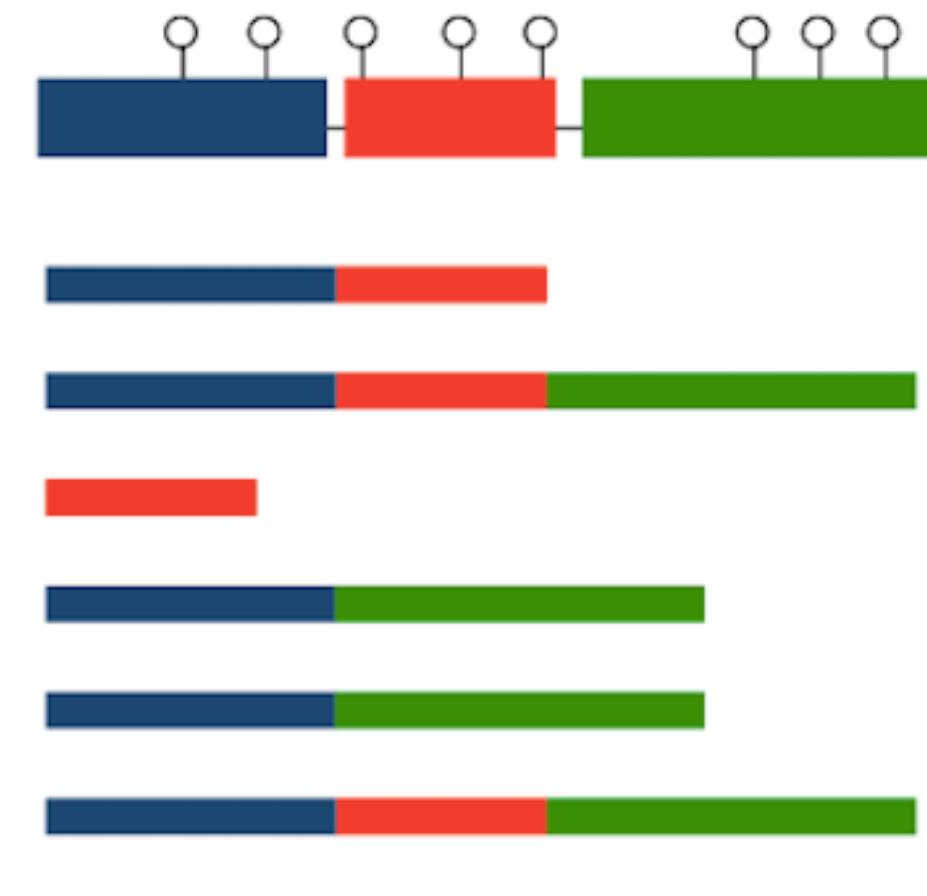
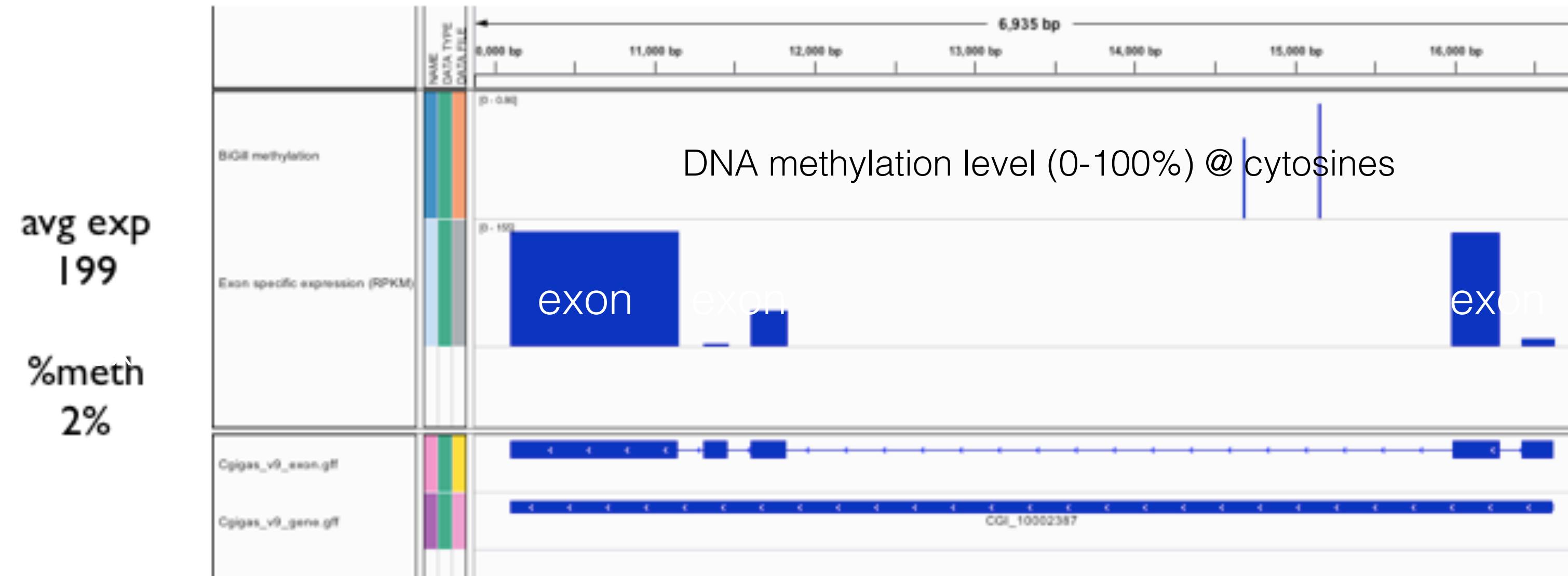
BRIEFINGS IN FUNCTIONAL GENOMICS, VOL 13, NO 3, 217-222

**A context dependent role for
DNA methylation in bivalves**

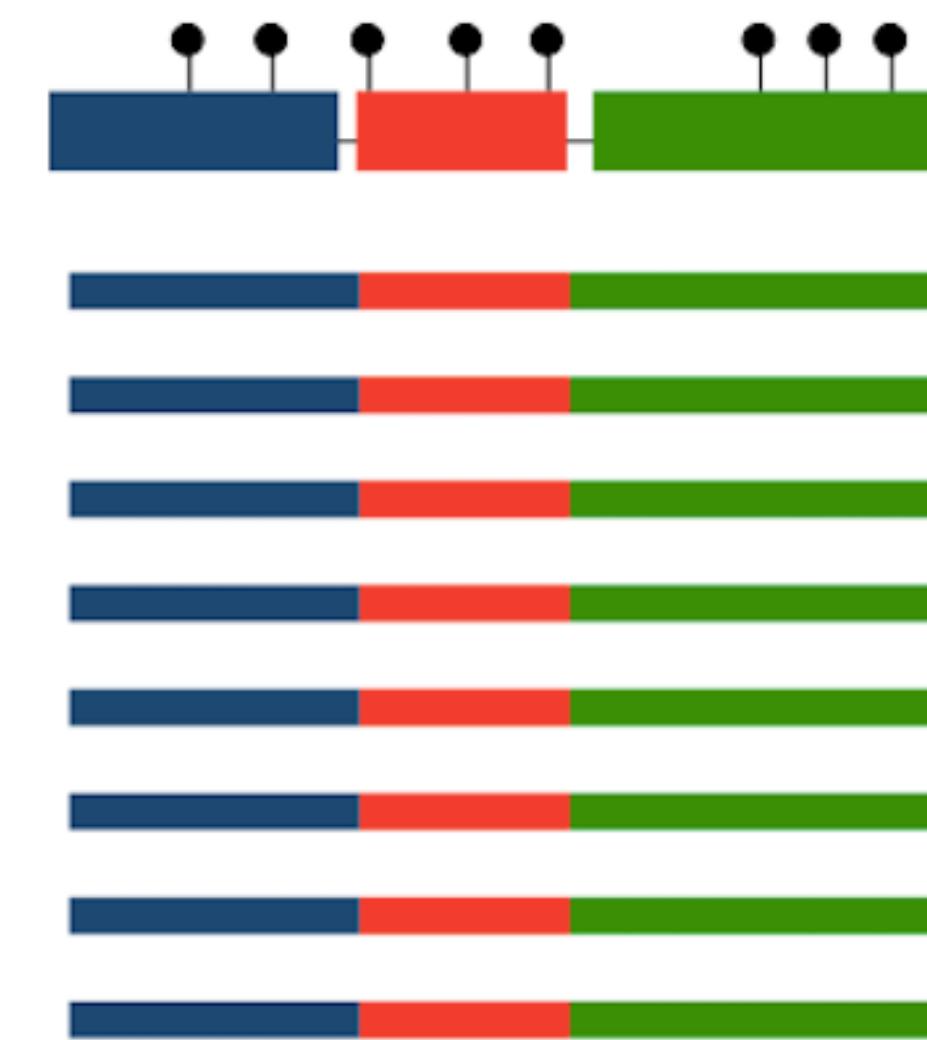
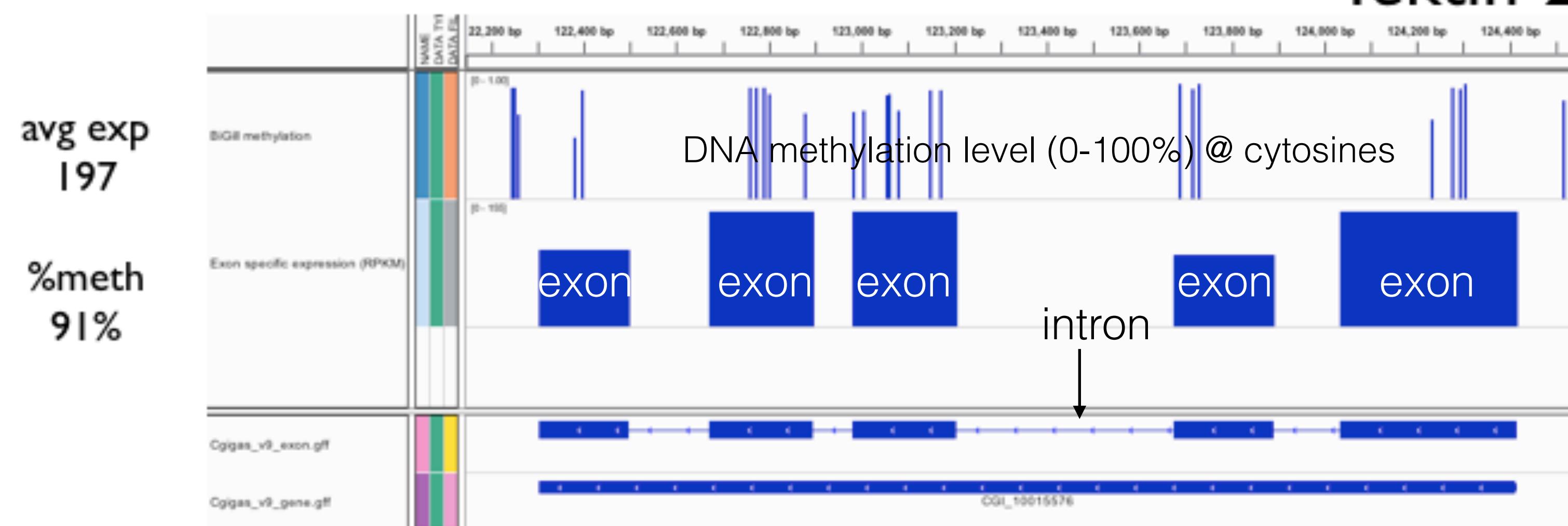
Mackenzie R. Gavery and Steven B. Roberts
Advance Access publication date 7 January 2014

Could STOCHASTIC VARIATION contribute to ACCLIMATIZATION and ADAPTATION?

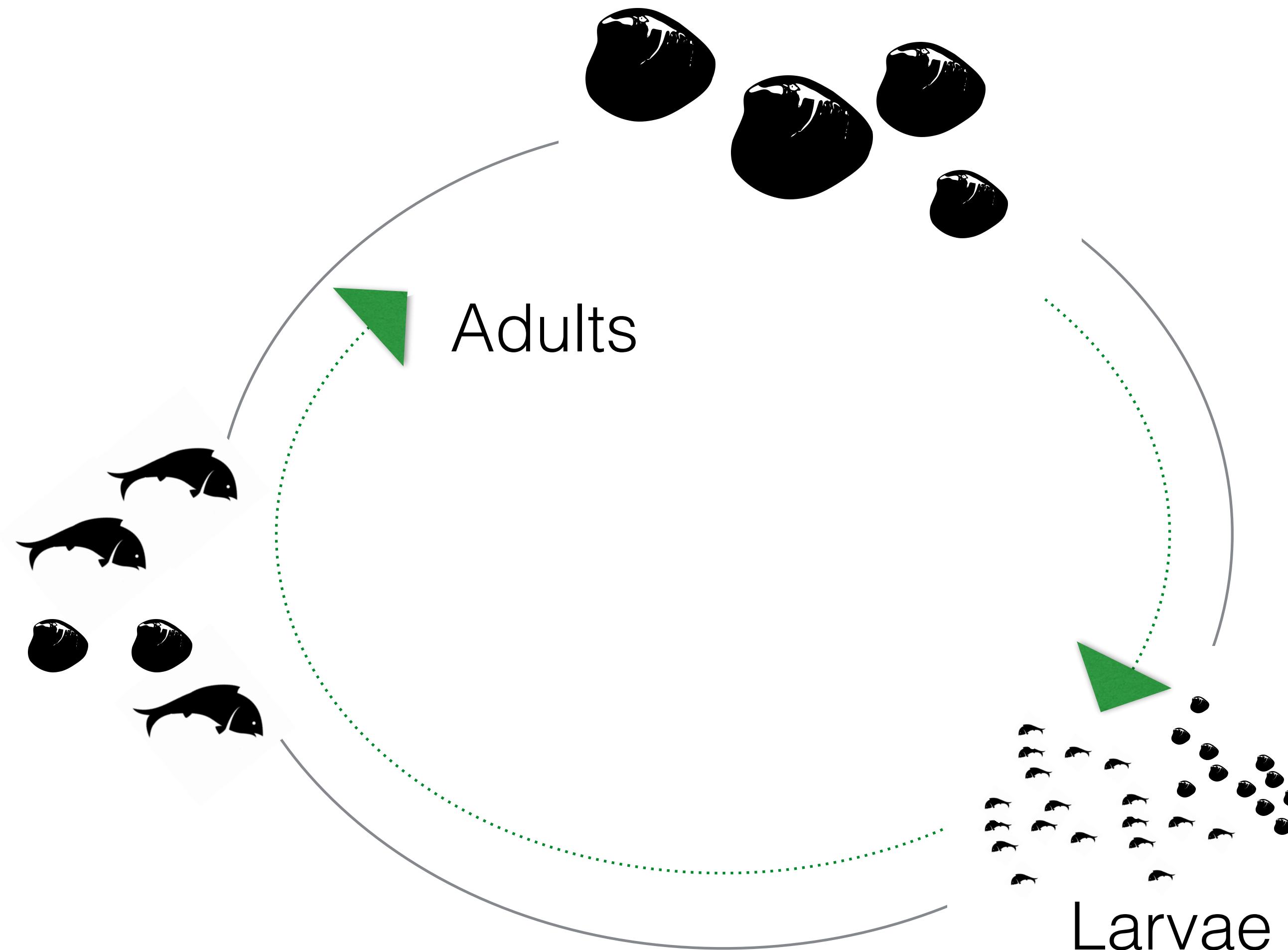
Heat shock 70 kDa protein 12A



Tektin-2

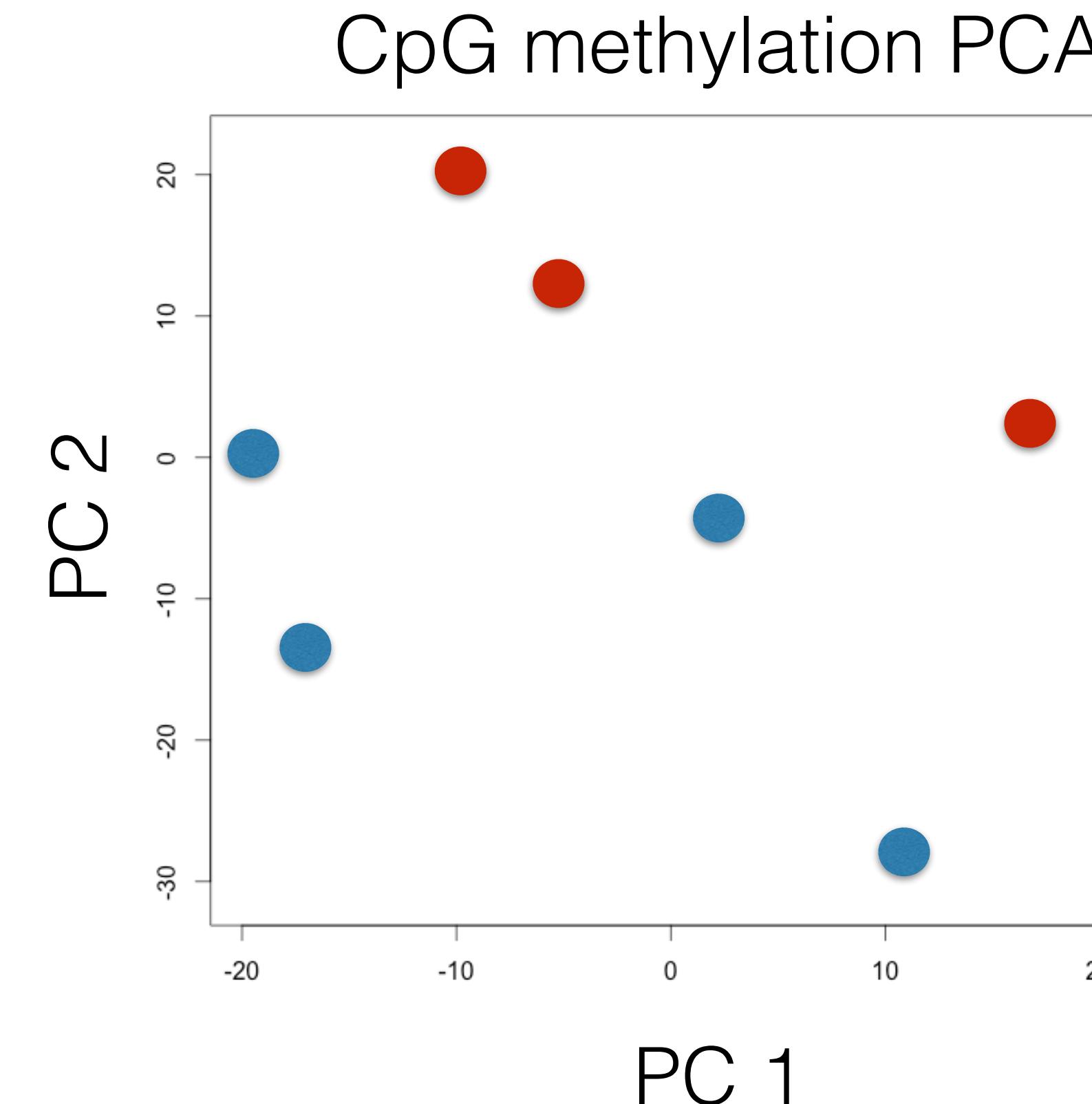


KEY MECHANISMS OF ACCLIMATIZATION AND ADAPTATION TO GLOBAL OCEAN CHANGE



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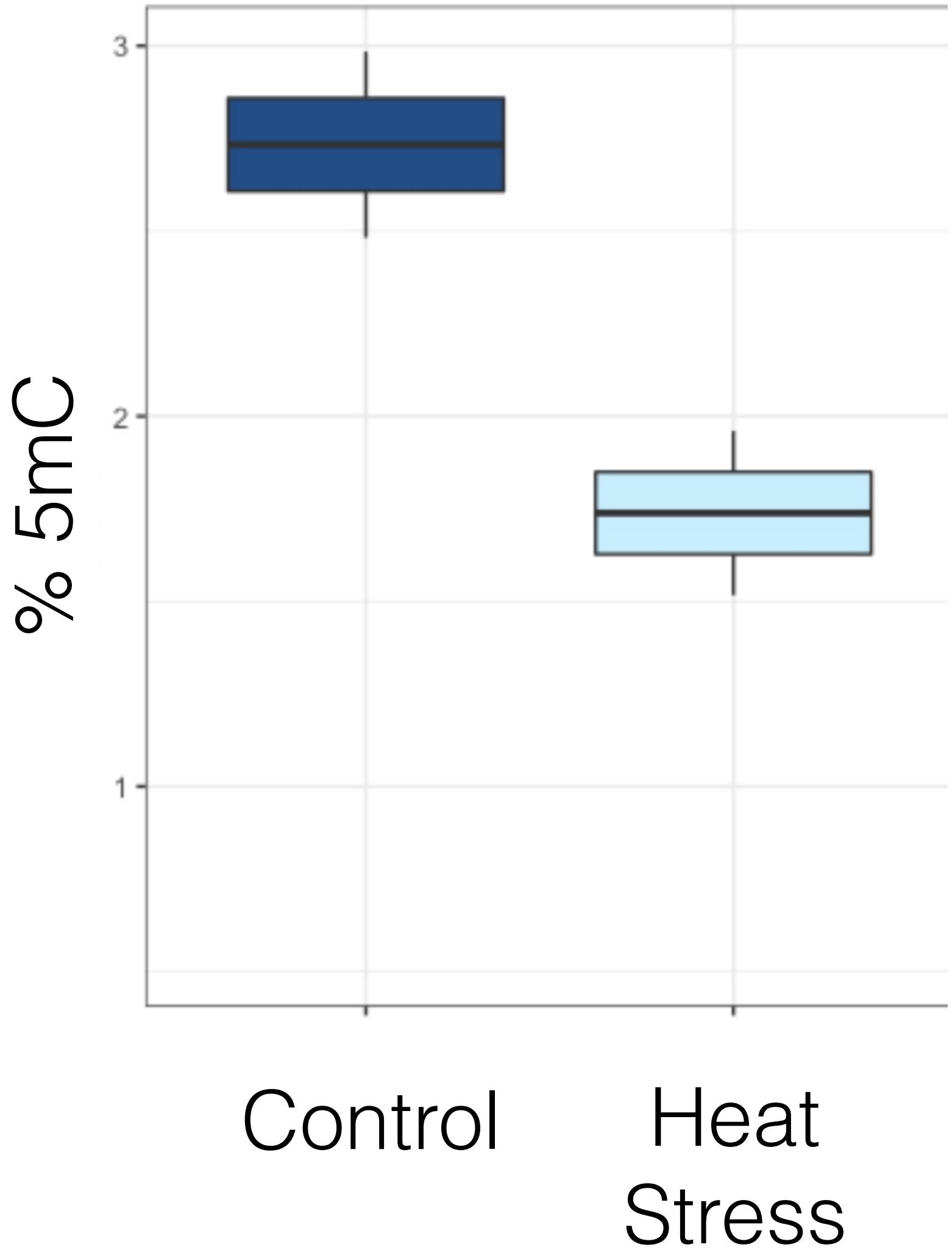
Local Environmental Differences Influence DNA Methylation Patterns



MBD-BS Sequencing



Temperature and Desiccation Decreases Global DNA Methylation

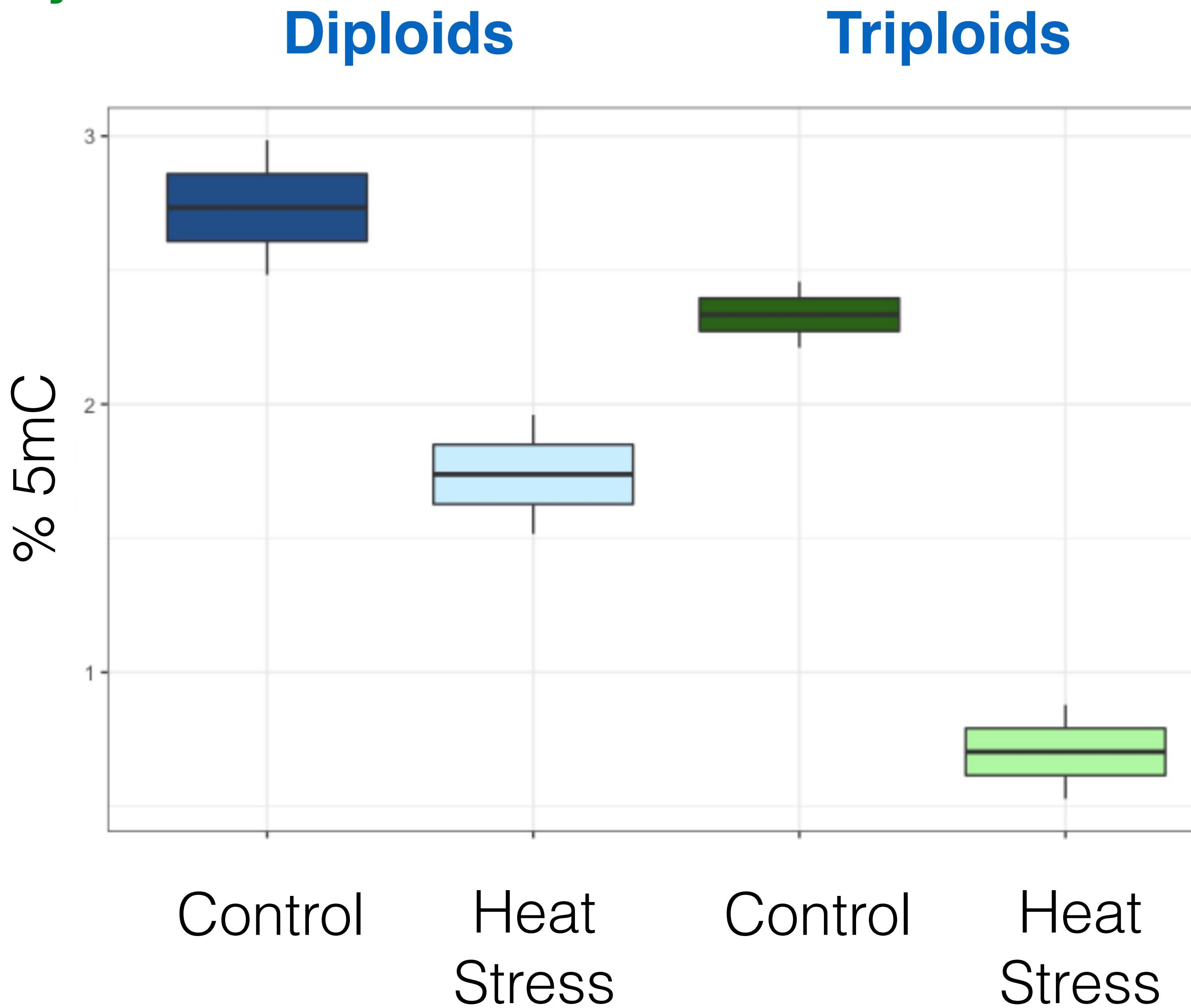


DNA Methylation ELISA

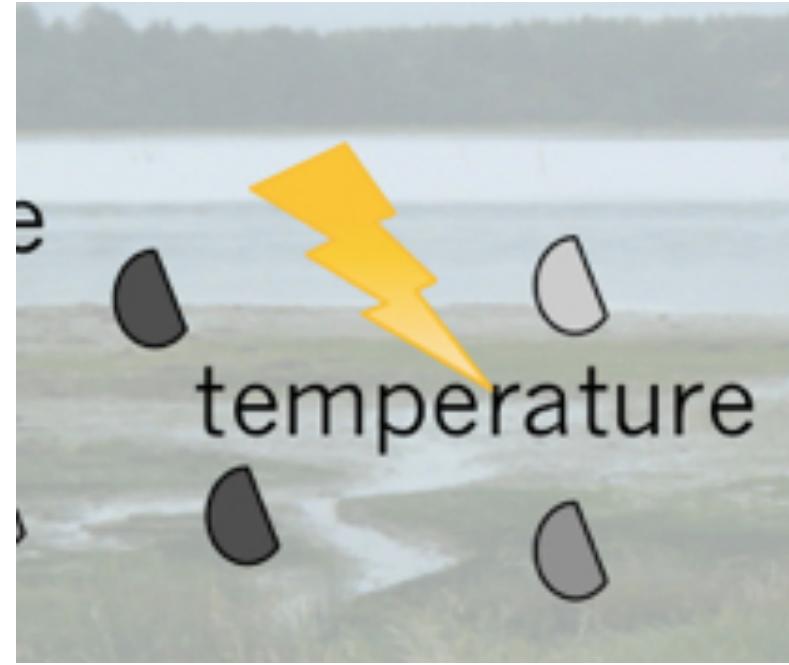
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DNA Methylation ELISA



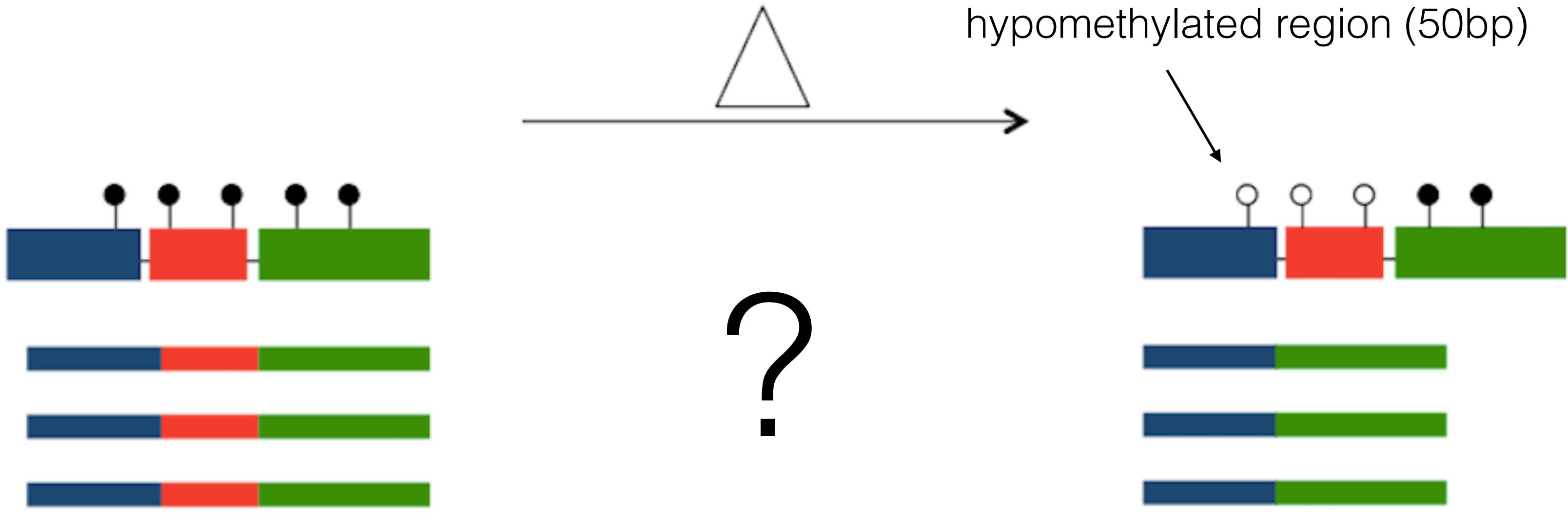
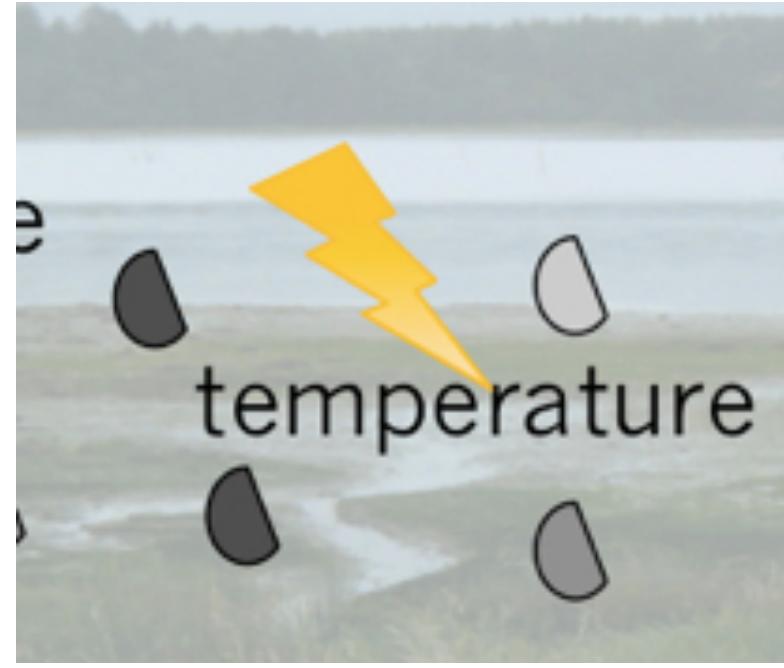
Temperature Alters CpG Methylation



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

MBD-Array

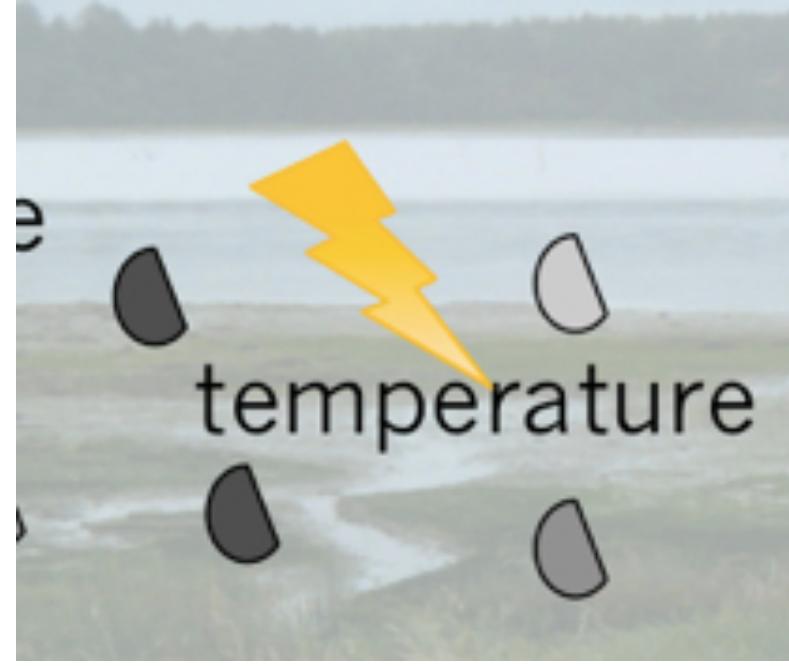
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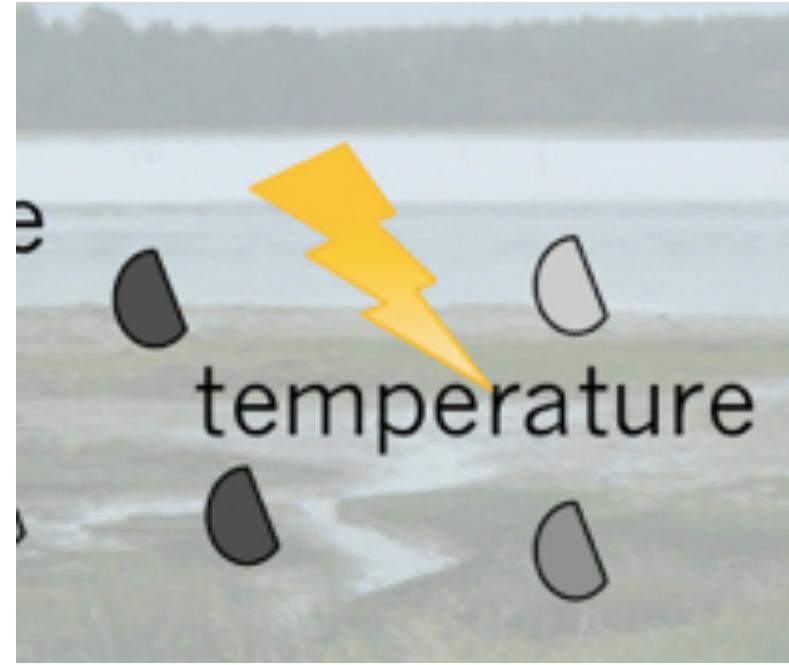
Temperature Alters CpG Methylation



Oyster	Hypo-methylated	Hyper-methylated
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No obvious association
with genome feature
including *differentially*
expressed
genes

Temperature Alters CpG Methylation



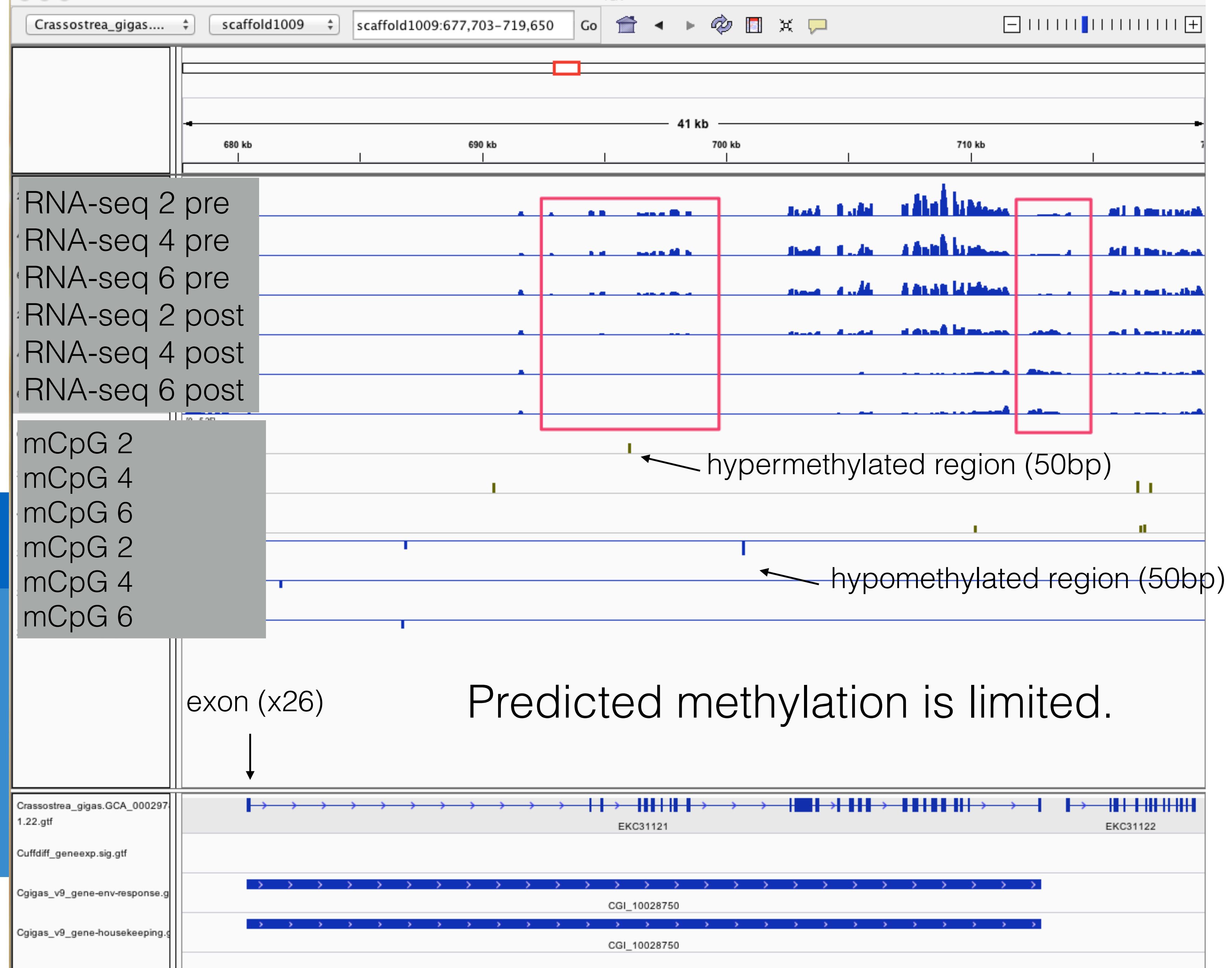
Oyster

2

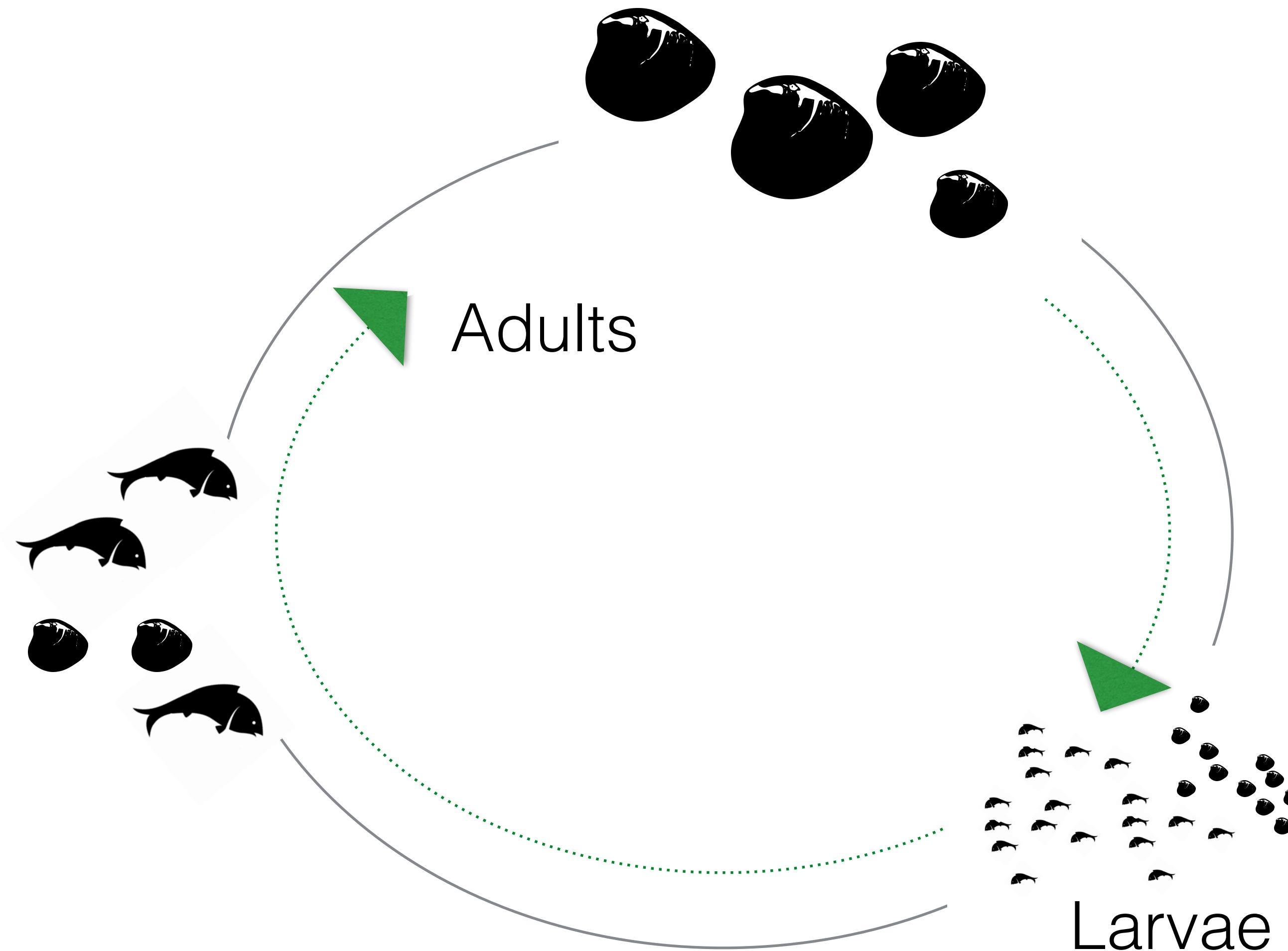
4

6

MBD-Array



KEY MECHANISMS OF ACCLIMATIZATION AND ADAPTATION TO GLOBAL OCEAN CHANGE

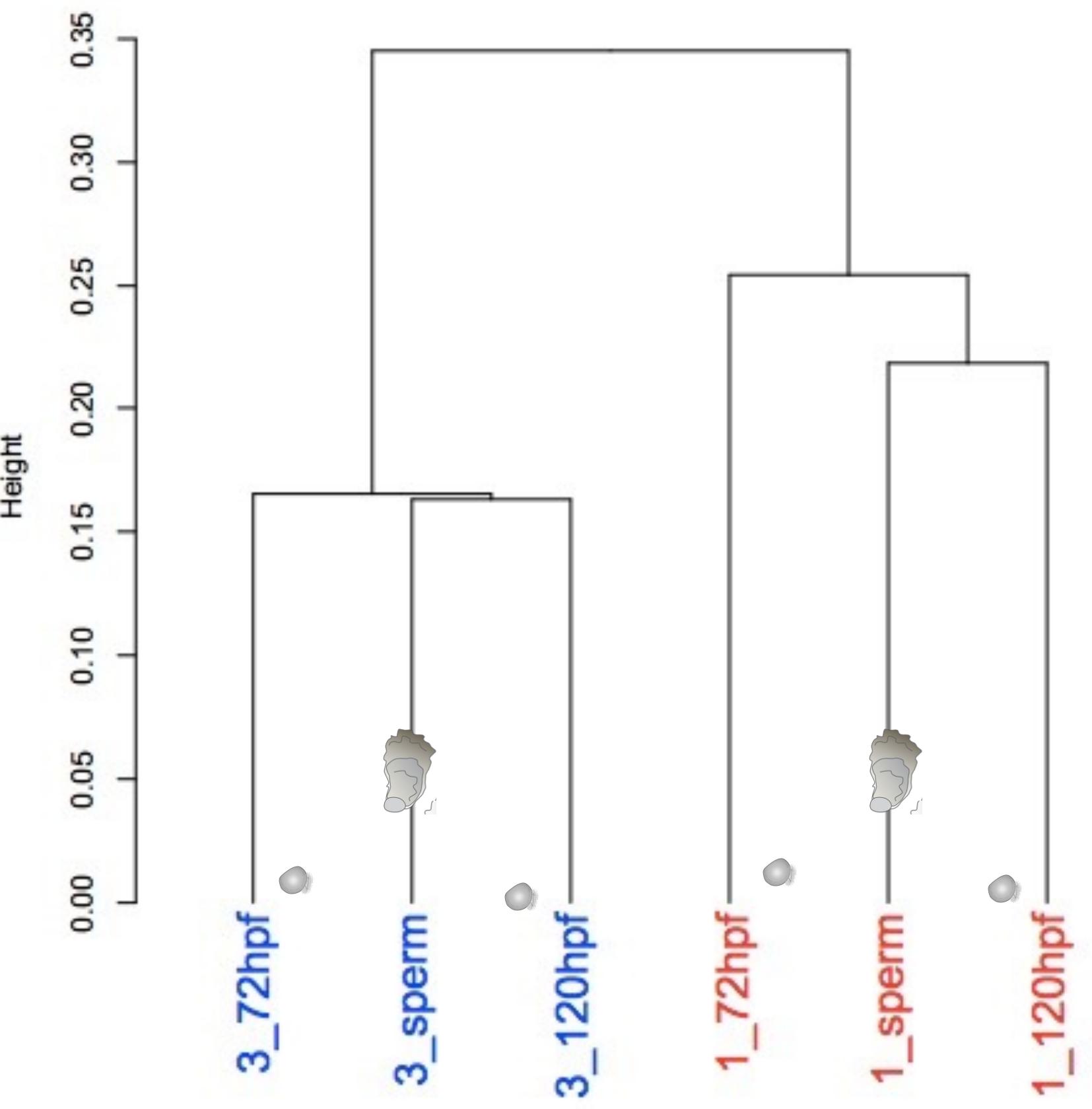


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Family Specific DNA Methylation Patterns Exist



CpG methylation clustering



Cold
Spring
Harbor
Laboratory

bioRxiv
beta

THE PREPRINT SERVER FOR BIOLOGY

New Results

Indication of family-specific DNA methylation patterns in developing oysters

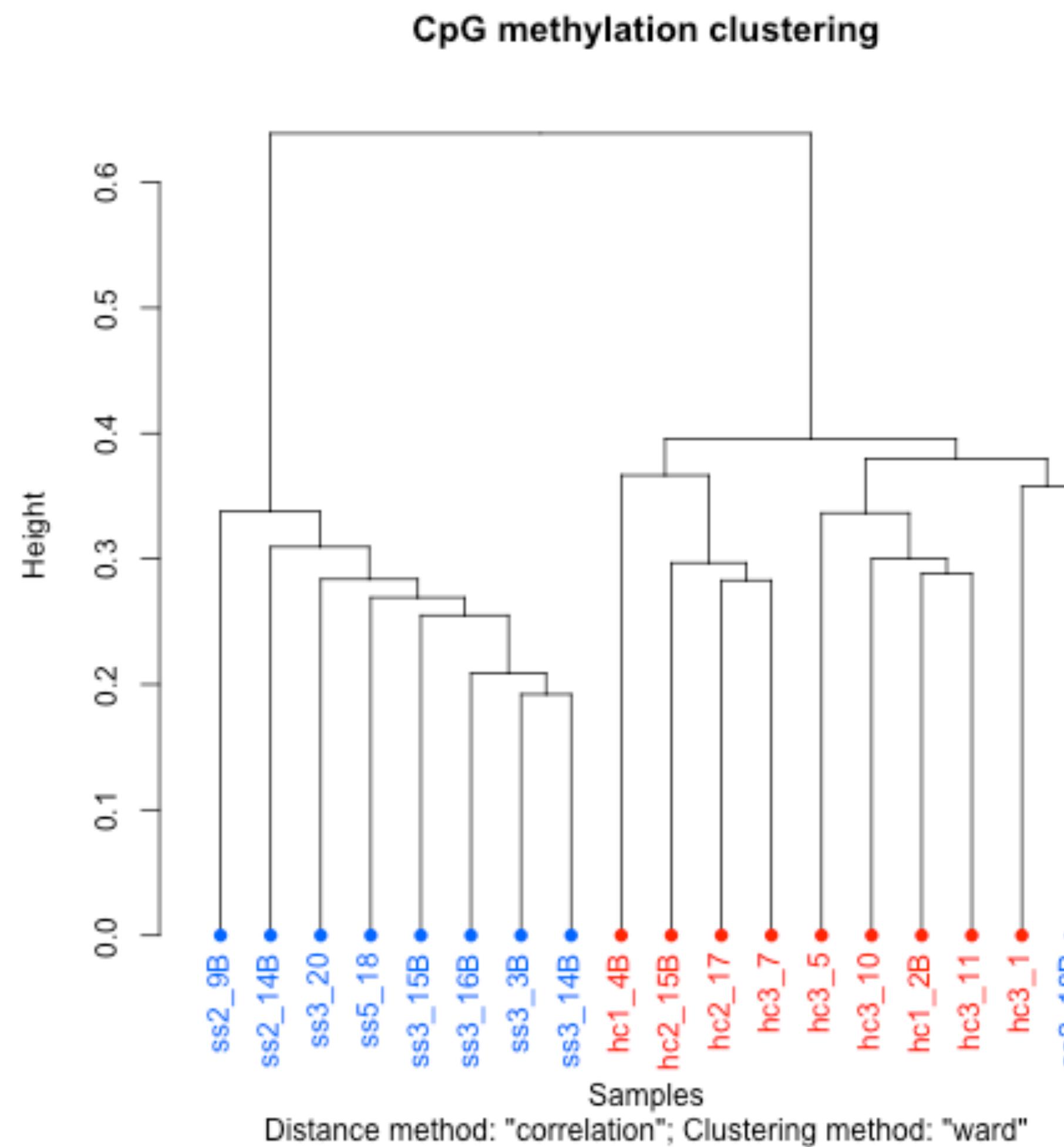
Claire E. Olson , Steven B. Roberts

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

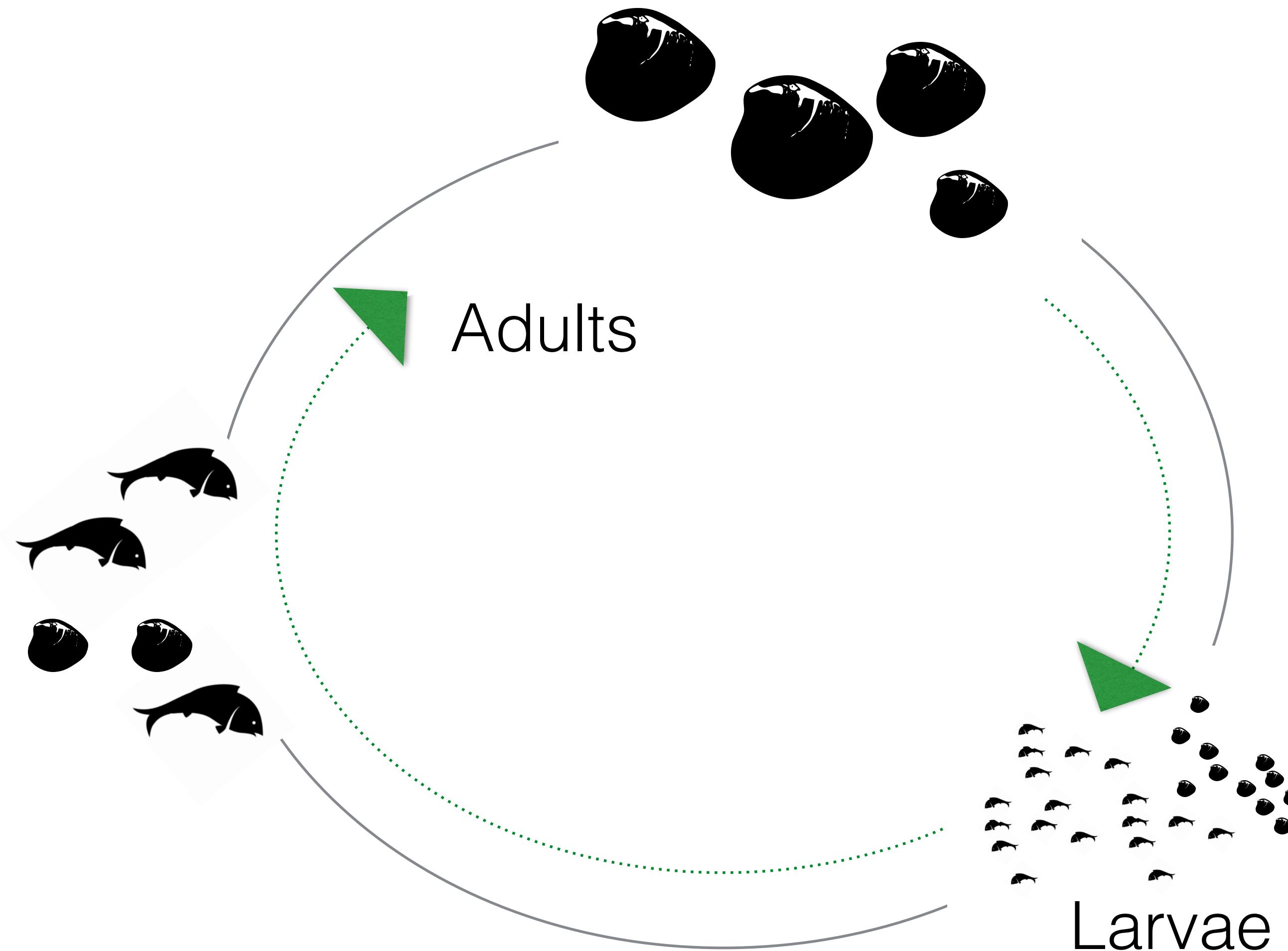
Population DNA Methylation Patterns Persist in Transplant Experiment



Population DNA Methylation Patterns Persist in Transplant Experiment

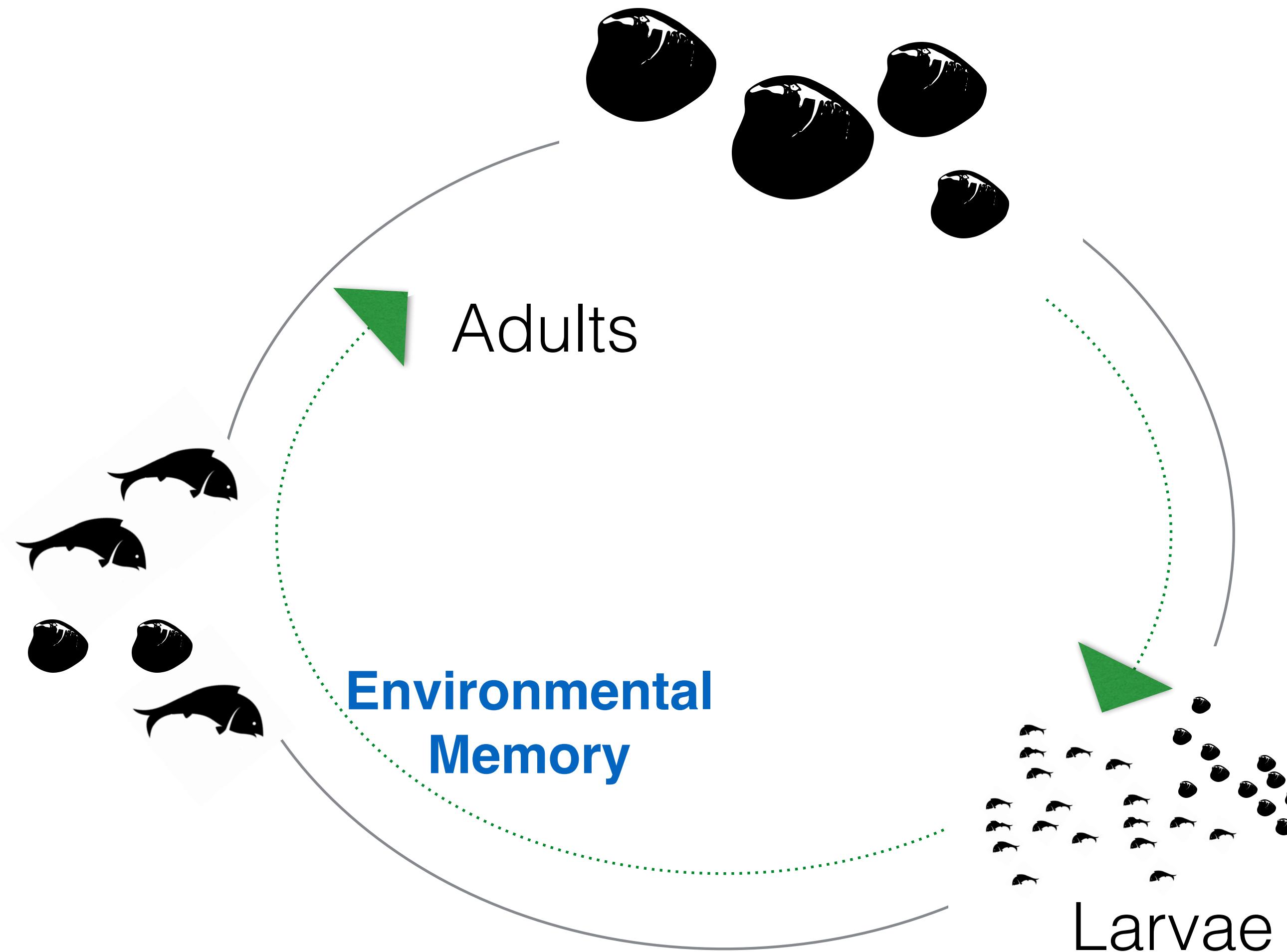


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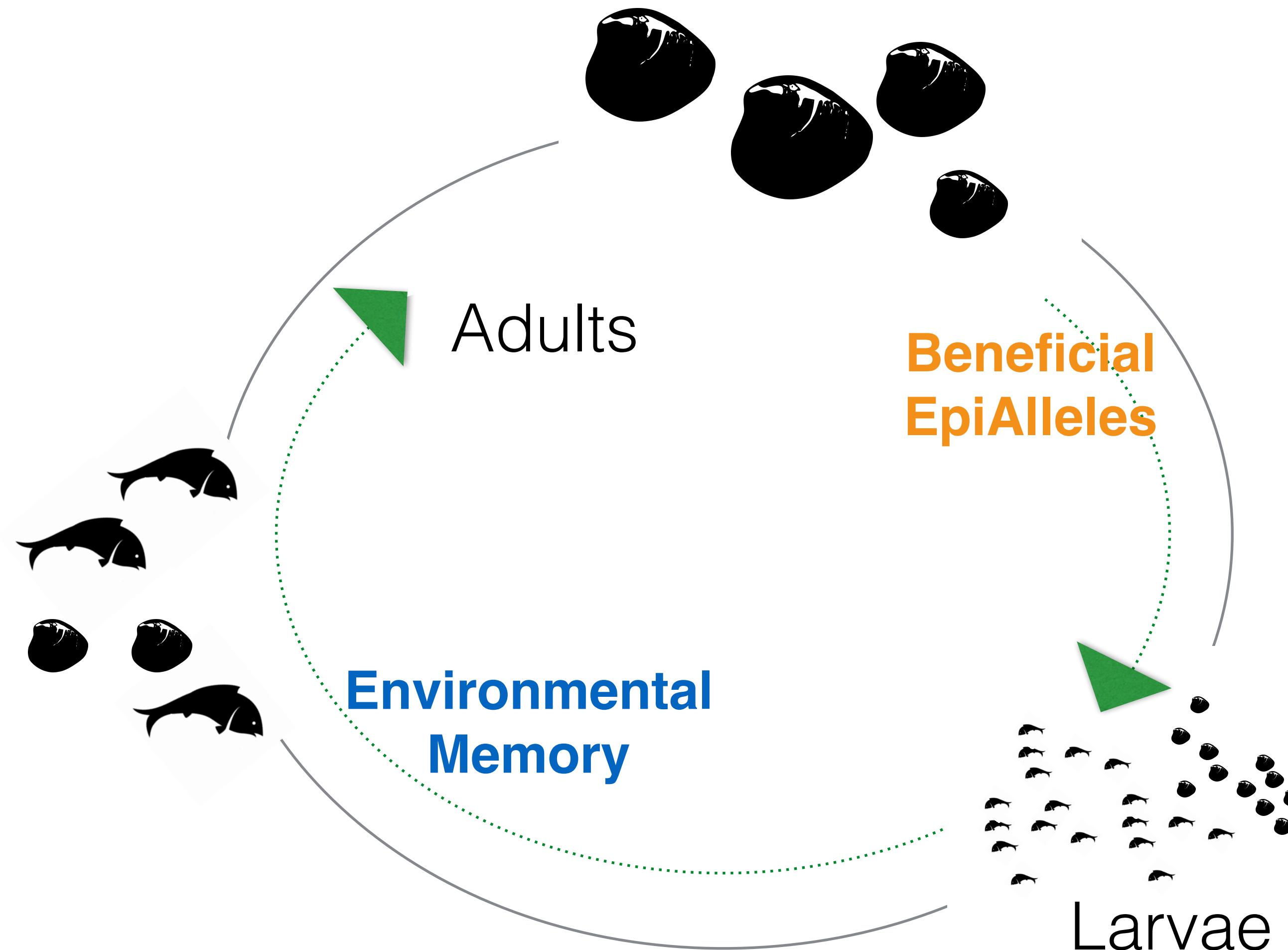
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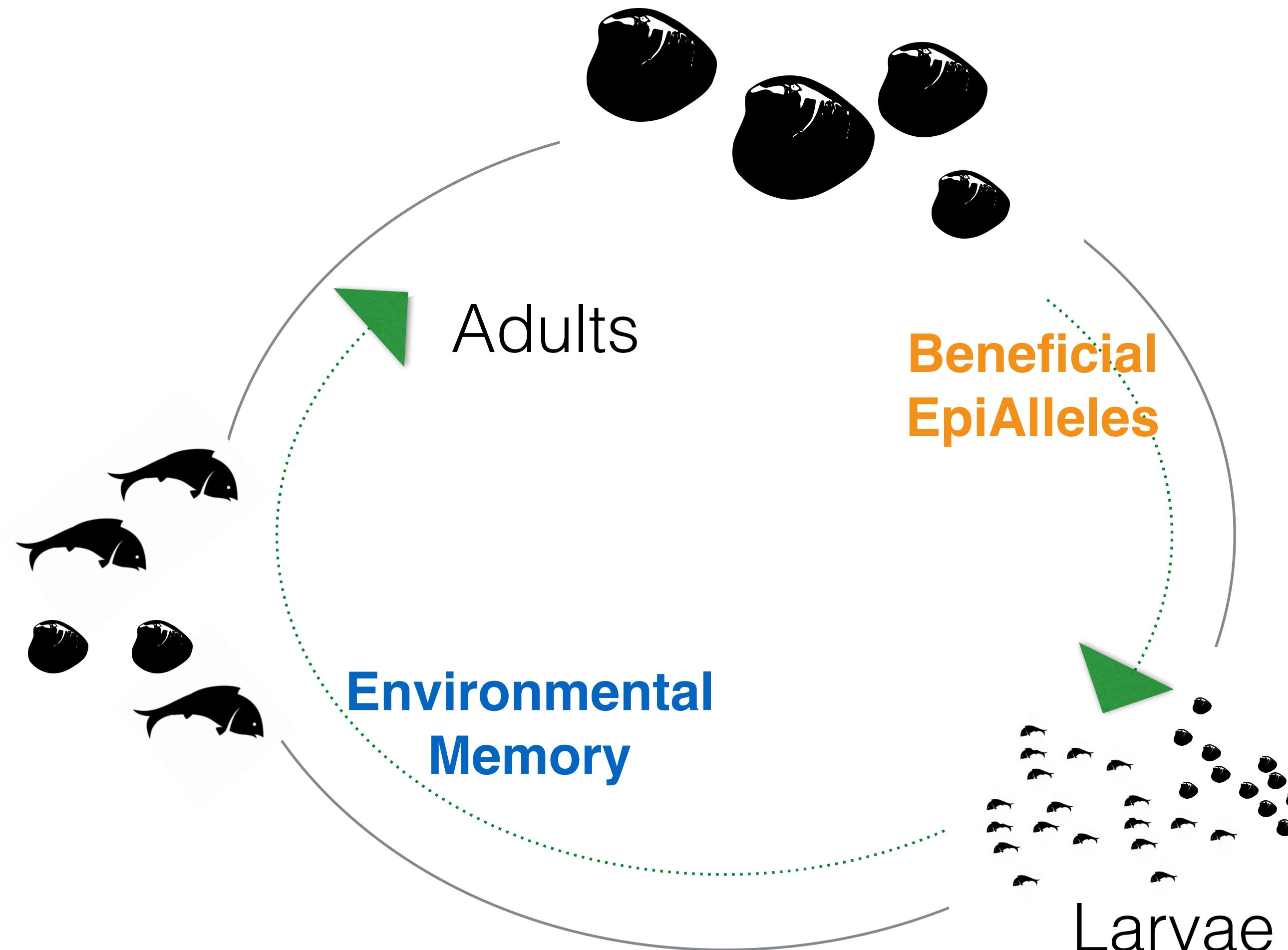
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**Increased phenotypes
via sparse methylation**

Acknowledgements

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Katherine Silliman

Jay Dimond

Laura Spencer



slides & more @

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

