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Effect of elevated pCO_2 on the production of DMSP and DMS in green seaweeds

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UKOA Annual Science Meeting, Exeter

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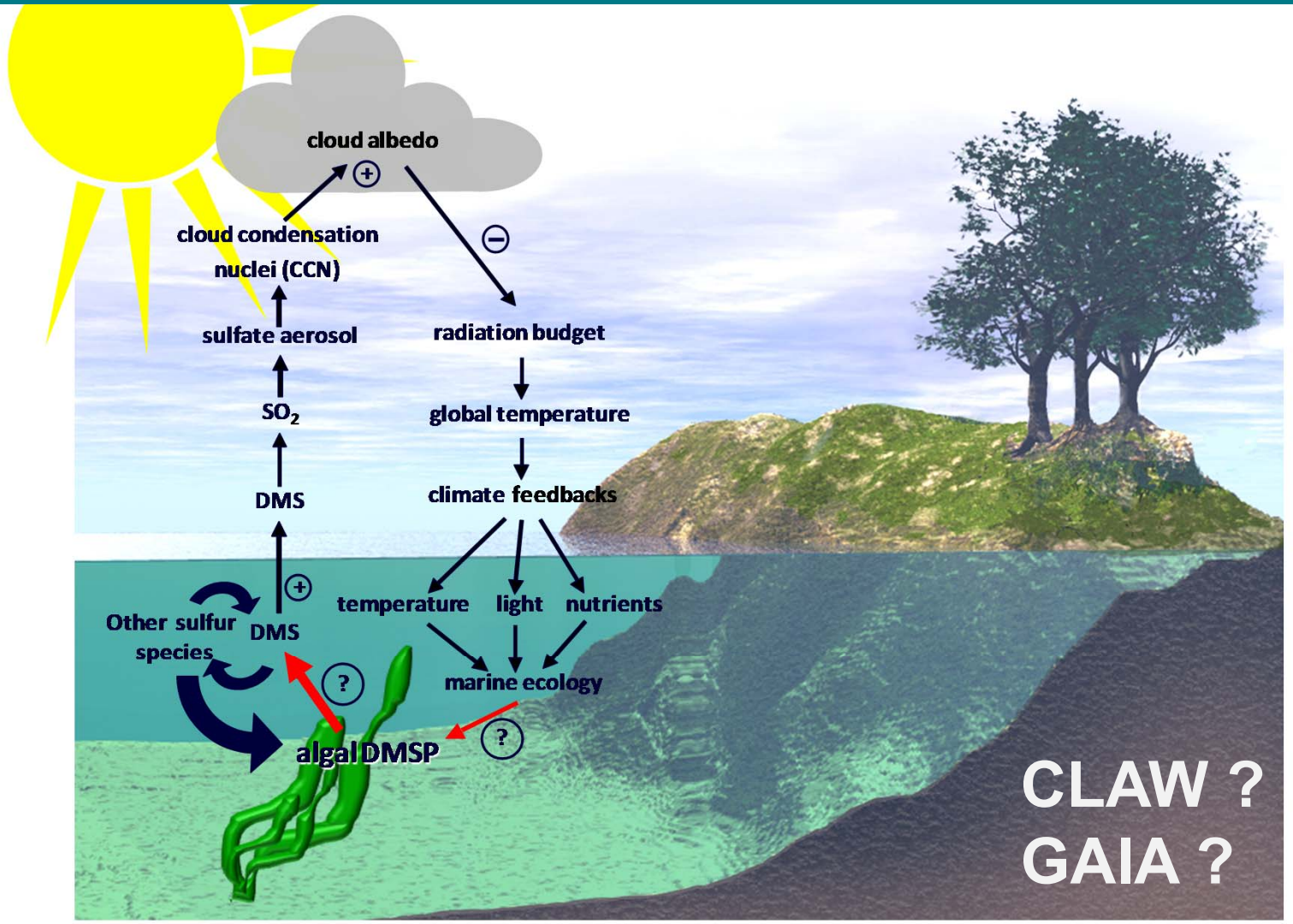
DMS and climate feedback?



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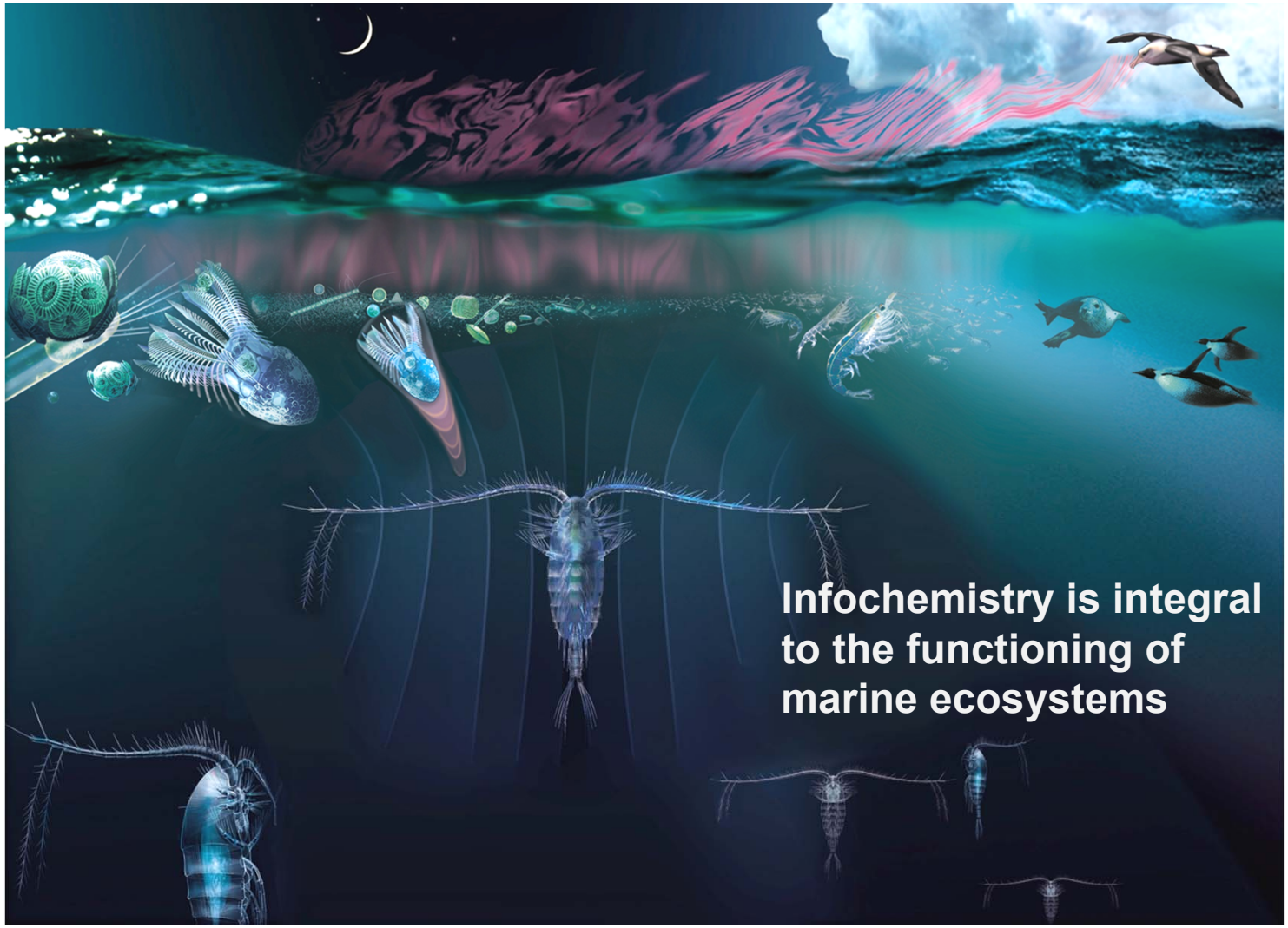
DMS and Infochemistry



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Conclusions

OA affects DMS production
Loss of >40% DMS production in future
- Modulated by light intensity

Reproductive cells contain DMSP
'Upside-down' benthic-pelagic coupling
- Transfers 20-60% benthic DMSP to plankton
- MZP grazing converts DMSP to DMS

OA affects release of RC
Often tenfold increase in RC/DMSP in future

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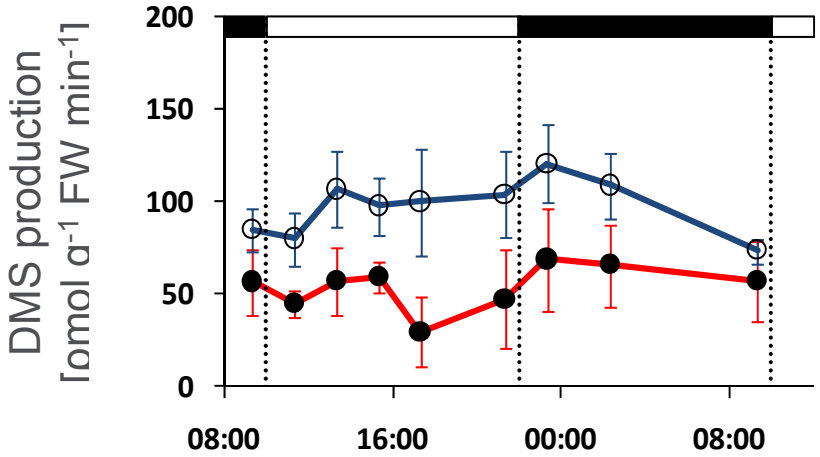
Culture of *Ulva clathrata*

- **after 5-week incubation at low light**
- **diel study**

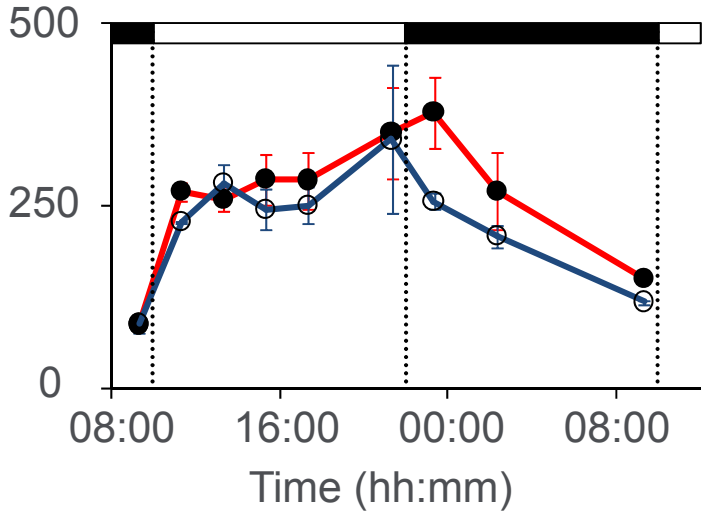
461 µatm 881 µatm

115 µmol m^{-2} s^{-1}



Future: 42% reduction over 24 h
(142 vs. 82 nmol d^{-1}; $p<0.05$)

350 µmol m^{-2} s^{-1}



Light-dependent overall increase
(330 and 389 nmol d^{-1}; $p>0.05$)

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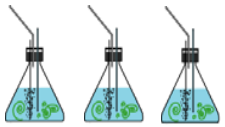
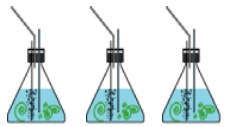
Culture of *Ulva clathrata*

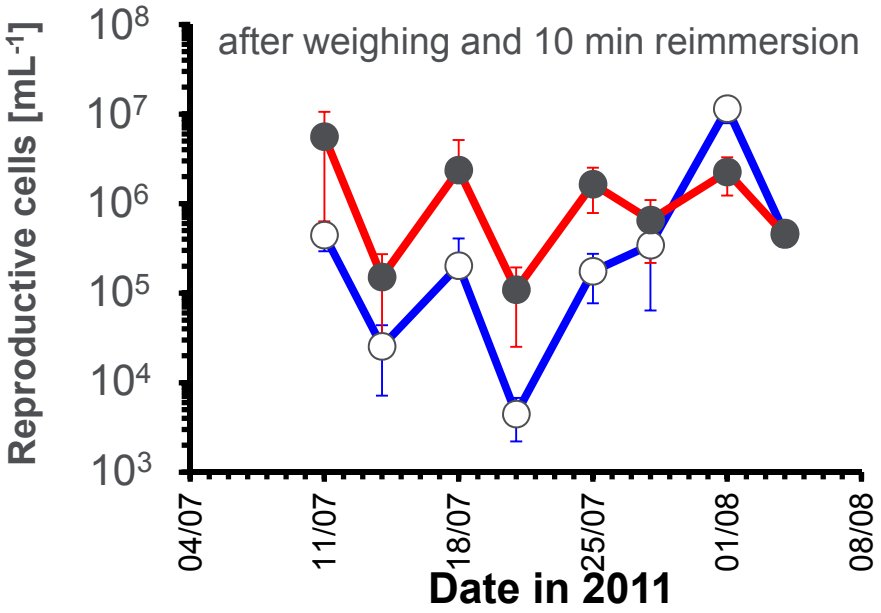
- **29 day incubation**
- **'Present' and 'Future'**

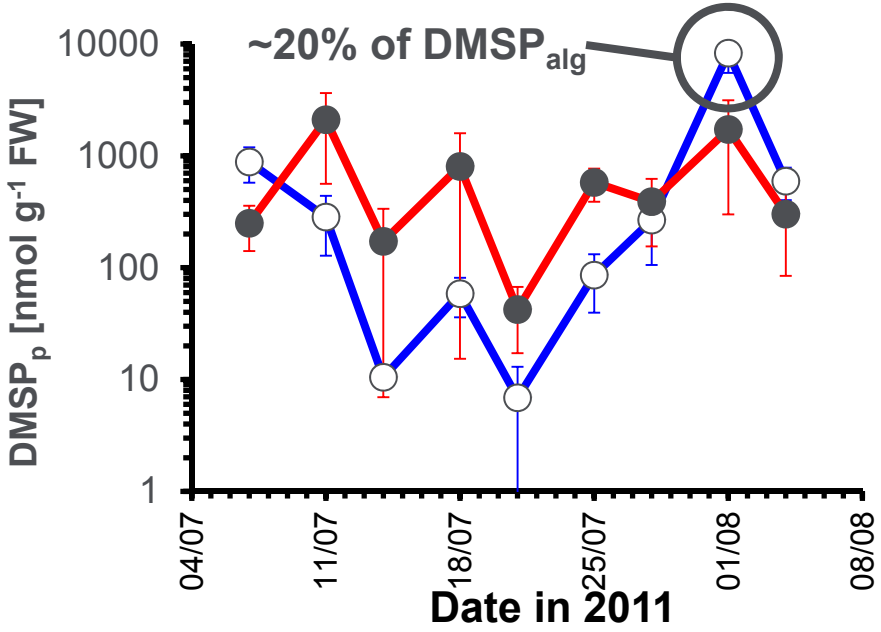


385 µatm



750 µatm





Future: Often 10-fold higher release

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