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# Nuclear applications to study potential effects (directs or indirects) of ocean acidification on marine organisms

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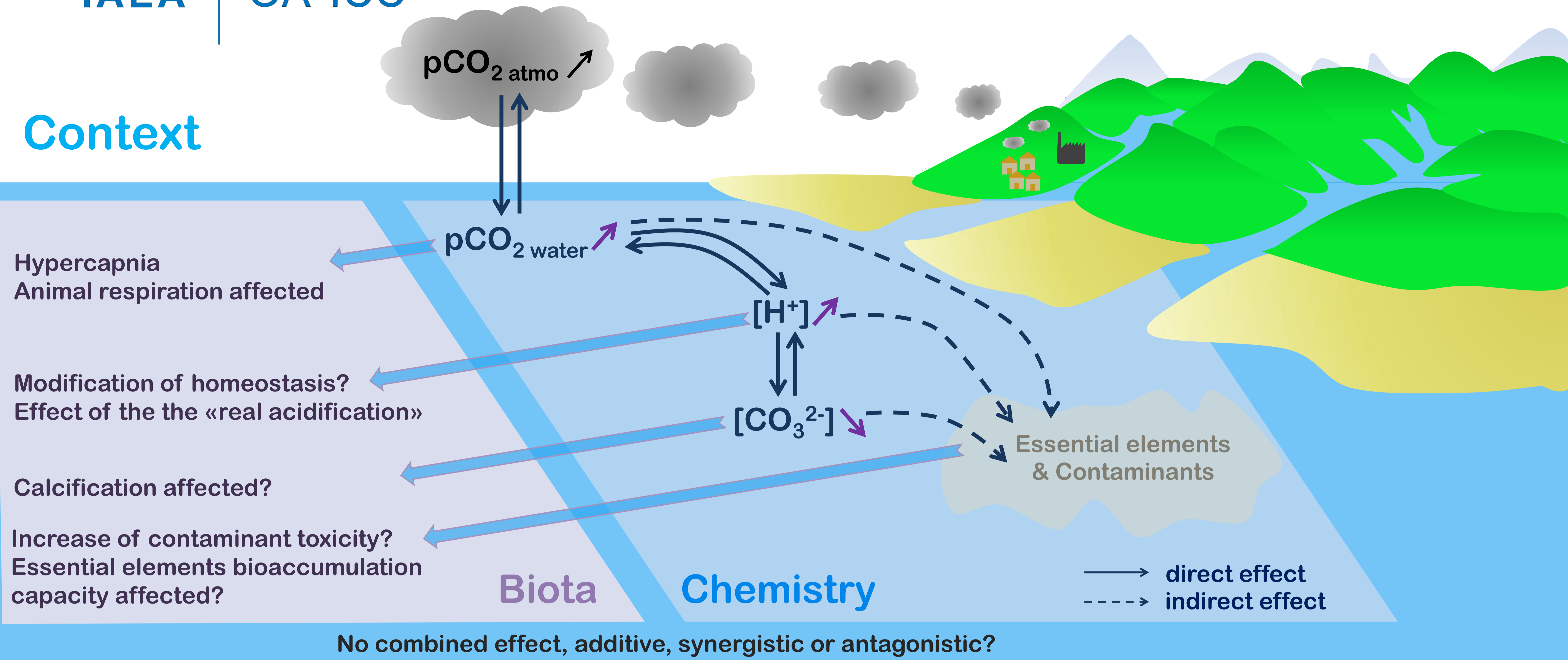
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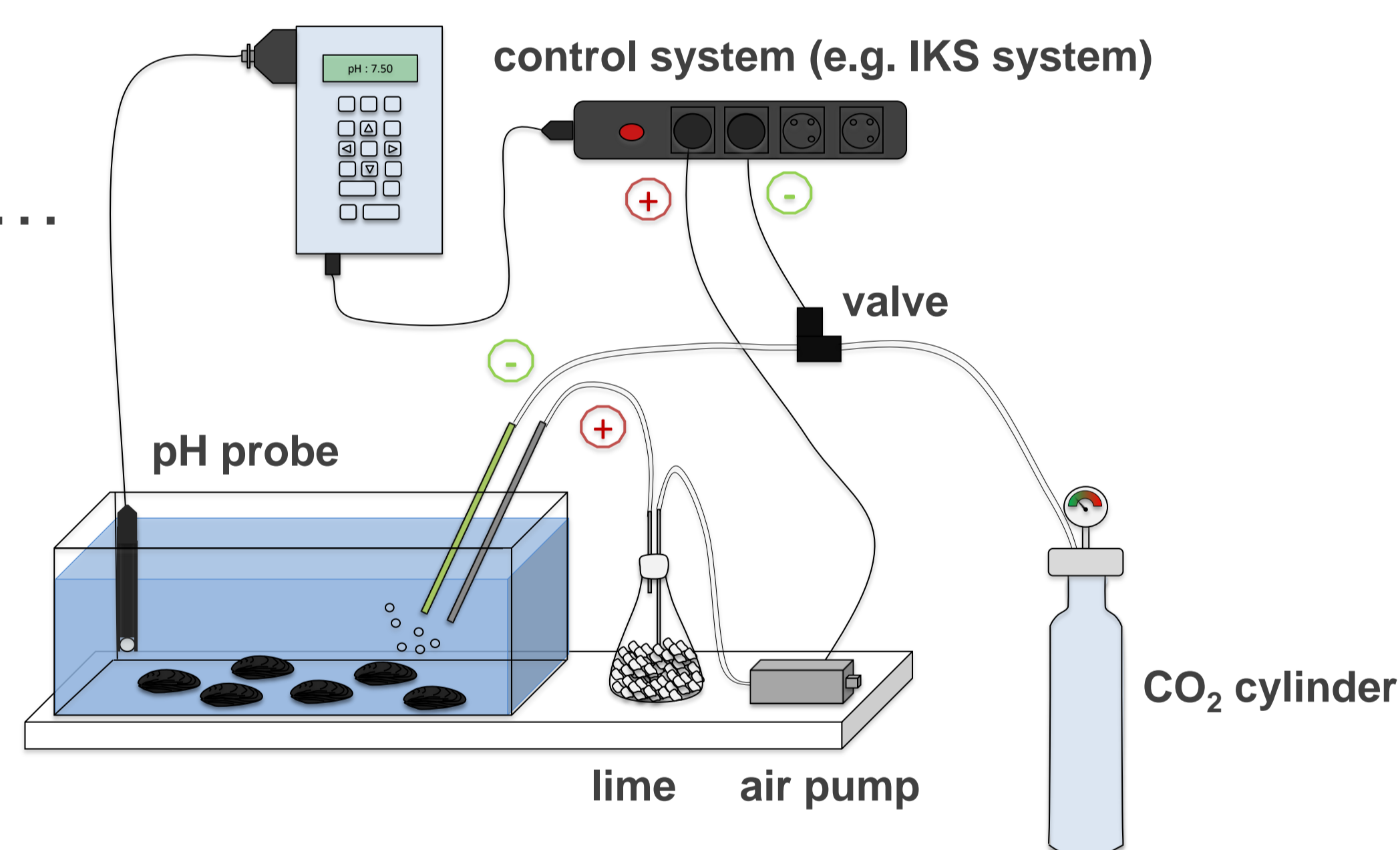
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## Context



## Experimental approach

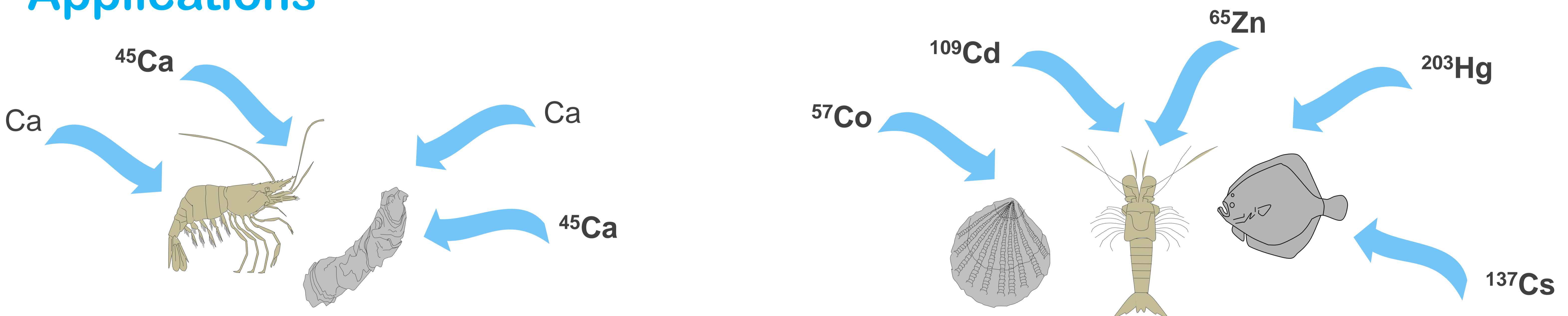
- **Gamma emitters:**  
 $^{51}Cr$ ,  $^{54}Mn$ ,  $^{57}Co$ ,  $^{65}Zn$ ,  $^{203}Hg$ ...
- **Beta emitters:**  
 $^{14}C$ ,  $^3H$ ,  $^{45}Ca$ ,  $^{63}Ni$ ...



## Advantages of radiotracers

- **Cost effective**
- **Low levels of elements used** (closed to background levels)
- **High sensitivity & specificity**
- **Easy handling**
- **Individual counting & Live organisms** (for gamma emitters)

## Applications



### Impacts of ocean acidification on calcification

- **Production of commercial species**  
Shrimps, bivalves, sea urchins...
- **High-value ecosystem as coral reefs**  
High biodiversity, tourism....

### Effects of ocean acidification on essential element and contaminant bioavailability

- **Potential element toxicity or depletion for organisms**  
→ environment risk
- **Concentration in seafood**  
→ human risk