

## ***Interactive comment on* “Molecular biology techniques and applications for ocean sensing” by J. P. Zehr et al.**

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I read this paper as not only a non-specialist, but also a non-life scientist. My background is ocean engineering. However, within my group we have recently grown a team developing in situ biogeochemical sensors, including molecular sensors (although early days yet). Zehr and his co-authors have set themselves an ambitious goal, "... to acquaint the non-specialist with the breadth of molecular biology techniques, in order to provide the scope and vision for how molecular biological techniques may ultimately be ported to ocean-sensing technology, in situ." Being exactly what I needed, I looked forward to reading the paper.

The paper succeeds for me in:

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1. Describing the essence of many molecular techniques with numerous relevant references to follow. Jargon is inevitable, but the authors do a reasonable job of explaining several of the techniques, although an on-line encyclopedia was essential!
2. Providing numerous examples of the questions in ocean sciences that these techniques can address. Here Figures 1 and 3 are particularly helpful.
3. Pointing to those techniques with the potential to be incorporated within in situ sensors.

Figure 1 is most useful. It would be enhanced if those techniques referred to later and without acronyms in the figure (e.g. automated rRNA intergenic spacer analysis) had their acronyms added at this early stage, improving the figure's usefulness as an introduction to the paper. Its usefulness would be further enhanced if a few sentences at the end of section 1 pointed the reader to the relevant sections in the paper dealing with the techniques mentioned.

A few specific questions from this non-specialist:

1. Page 627 line 8 - UV radiation is mentioned as a process causing mutations, can the authors provide an example that might be more relevant to the marine environment away from the surface?
2. Page 627 line 22 - 'most environmental organisms have not been cultivated' - the reference is dated 1998, is this still the case?
3. Page 633 - the heading for section 5 is cryptic - might a heading that was more general e.g. ... fingerprinting ... be appropriate?
3. Page 638 line 25 - the He et al. paper (for which I am grateful for the reference) mentioned use of the device in marine sediments, not mentioned here.

Have the authors achieved their goal? For me, yes; their paper, with an on-line encyclopedia for terminology and background, and delving into some of the more applied

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references, has raised my level of appreciation of what molecular techniques are appropriate to answering questions in ocean science.

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