Changes in *Nematostella vectensis* Cell Composition in Response to a Synthetic Immune Stimulant

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Introduction:

Why Use *Nematostella vectensis*?

- Closely related to coral[2].
- Easy to maintain[5],can induce reproduction[4,2]

Figure 1: *Nematostella* Phylogenetic Relationship to Coral

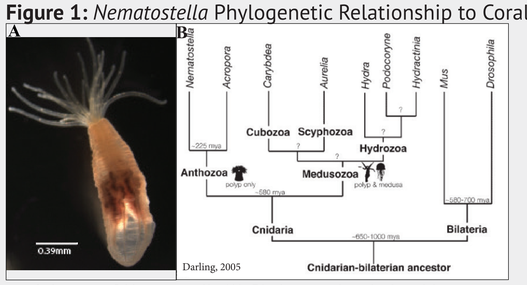

Figure 1: Image of *Nematostella* (A). Phylogenetic relationship among cnidarian[2](B).

Purpose of Experiment:

- Expose cells to LPS
- Track change in Cell Composition

Hypothesis:

- Cell composition will change after LPS exposure

Methods

- Organisms Sterilzed
- Cells Dissociated and Cultured
- Exposed to LPS
- Cell Composition Tracked with Hemocytometer

Figure 2: Layout of Cell Cultures

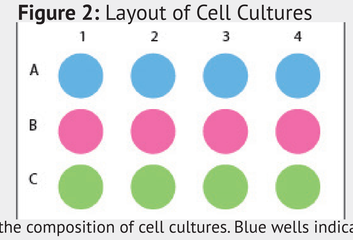

Figure 2: Shows the composition of cell cultures. Blue wells indicate cell cultures deriving from a single organism. Each blue well is a replicate culture sample for one individual.

Results:

Figure 3: Identified Morphological Cell Types

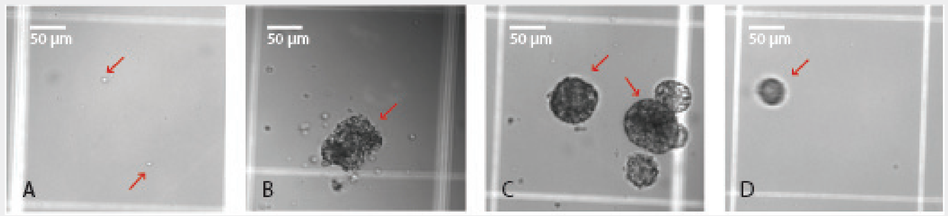

Figure 3: Profile of 4 cell types created during experimentation. A) CT1, most populous cell type B) CT2, large irregularly shaped, circulates small cells and debris C) CT3, circular or ovoidal, dark D) CT4 highly mobile, circular, lingers near debris and other cells

Figure 4: Composition of Large Cell Types After Exposure to LPS

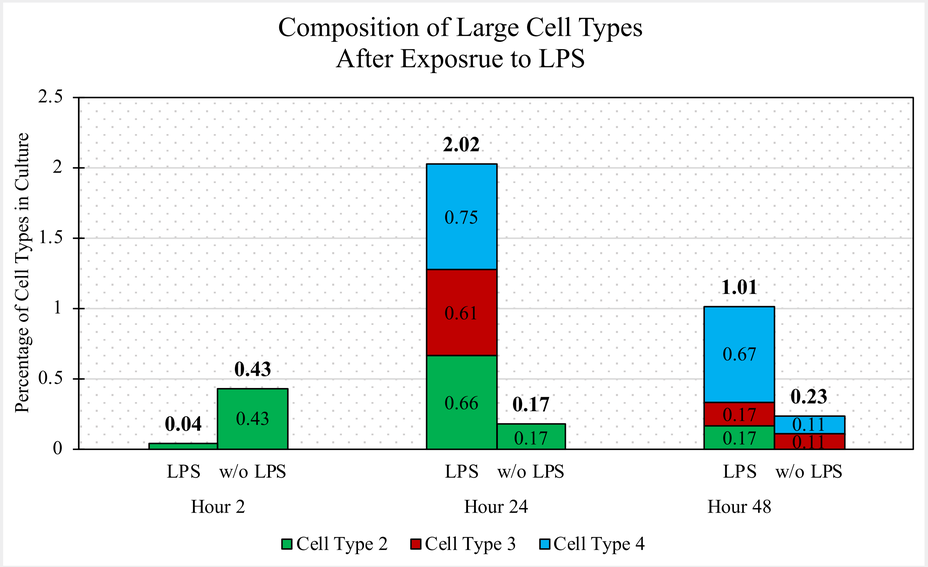

Figure 4: Composition distribution of large cells present in cultured cells exposed to LPS vs control cell cultures.

Conclusions:

- Cell composition changes with LPS exposure
- Large cell types increase
- Cellular response begins between 2-24 hours
- Peak in large cells followed by decrease

Discussion

- Cell types resemble a cells with 75% pathogen stress associated transcripts[1]
- Slower than wound healing response[3]
- Cell production rate is time dependent

Future Directions:

Further Experimentation:

- Identify CT2-4
- Transcriptome analysis
- Deterioration rate

Further Applications:

- Early identification of cnidarians under immune stress

References:

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