Invertebrate Stress Response

1. General stress response
   1. Lacoste et al. 2001. Evidence for a form of adrenergic response to stress in *C. gigas*.
      1. Noradrenaline and dopamine released by hemocytes in response to stress, NA = 10xdopamine
      2. Return to basal levels within 2 hours
      3. More primitive animals has higher circulating levels of catecholamine
      4. ACTH can induce catecholamine release
   2. Farcy et al. Transcriptional expression levels of cell stress marker genes in *C. gigas*.
   3. Steinberg et al. 2008. Genes and environment.
      1. From Seiye 1936: 3 phases of stress response – bipartite alarm (modifications of biochemical and genetic parameters), resistance (defense mechanisms), exhaustion (collapse of cell function and death)
      2. Biphasic response of cell/organism to toxin: low-dose stimulation or beneficial effect, high dose is inhibitory or lethal
2. Temperature
   1. Rodriguez-Lanetty et al. 2009. Early molecular response of coral larvae to hyperthermal stress.
      1. Respiration rate increases with increasing T and time
      2. Only mortalities at hightest T and longest time (5% at 31C, 10 h)
      3. 55 differentially regulated, 29 unique contigs, 21 in NCBI
         1. upreg: hsps, histone H2B, B-cell receptor associated protein 31, NADPH oxidoreductase, BTG1, Egln2-prov protein gene
         2. downreg: nucleic acid metabolism (RNA binding protein, nuclear ribonucleoprotein, splicing factor genes), GFP-homologue gene, C-type lectin protein with mannose-binding site
      4. rapid response to hsps – survivorship under thermal stress
      5. GFP possibly expressed to prevent translation of proteins that would not function well under thermal stress
3. Evid