**Introduction**

After obtaining decent results for the prompt that focused on extracting only function, mechanism, and context, we tried to abstract the “part of” element as well. Note, that the second prompt trial (page 7) is after the results of the below prompt.

**Prompt**

Find the function of the organism, as in what is the organism trying to accomplish?

Find the mechanism of the organism, describe how the organism does the function.

Find the context of the organism performing the function. This could be a place, condition, or situation.

Find the part of the organism that is performing the function.

**Test on OpenAI Playground**

Text: Building a home from foam\u2014t\u00fangara frog foam nest architecture and three-phase construction process. frogs that build foam nests floating on water face the problems of over-dispersion of the secretions used and eggs being dangerously exposed at the foam : air interface. nest construction behaviour of tungara frogs, engystomops pustulosus, has features that may circumvent these problems. pairs build nests in periodic bursts of foam production and egg deposition, three discrete phases being discernible. the first is characterized by a bubble raft without egg deposition and an approximately linear increase in duration of mixing events with time. this phase may reduce initial over-dispersion of foam precursor materials until a critical concentration is achieved. the main building phase is marked by mixing events and start-to-start intervals being nearly constant in duration. during the final phase, mixing events do not change in duration but intervals between them increase in an exponential-like fashion. pairs joining a colonial nesting abbreviate their initial phase, presumably by exploiting a pioneer pair's bubble raft, thereby reducing energy and material expenditure, and time exposed to predators. finally, eggs are deposited only in the centre of nests with a continuously produced, approximately 1 cm deep egg-free cortex that protectively encloses hatched larvae in stranded nests.

Function: The Tungara frog is trying to build a home for its eggs.

Mechanism: The Tungara frog produces secretions that it uses to build a foam nest. The secretions float on water and form a bubble raft. The frog then deposits eggs in the raft.

Context: The Tungara frog builds its nest in a body of water.

Part of the organism: The Tungara frog produces secretions from its body that it uses to build the foam nest.

**Content**

* W2103410568
  + Sample: "title": "Building a home from foam\u2014t\u00fangara frog foam nest architecture and three-phase construction process", "abstract": "frogs that build foam nests floating on water face the problems of over-dispersion of the secretions used and eggs being dangerously exposed at the foam : air interface. nest construction behaviour of tungara frogs, engystomops pustulosus, has features that may circumvent these problems. pairs build nests in periodic bursts of foam production and egg deposition, three discrete phases being discernible. the first is characterized by a bubble raft without egg deposition and an approximately linear increase in duration of mixing events with time. this phase may reduce initial over-dispersion of foam precursor materials until a critical concentration is achieved. the main building phase is marked by mixing events and start-to-start intervals being nearly constant in duration. during the final phase, mixing events do not change in duration but intervals between them increase in an exponential-like fashion. pairs joining a colonial nesting abbreviate their initial phase, presumably by exploiting a pioneer pair's bubble raft, thereby reducing energy and material expenditure, and time exposed to predators. finally, eggs are deposited only in the centre of nests with a continuously produced, approximately 1 cm deep egg-free cortex that protectively encloses hatched larvae in stranded nests."
  + Strategy:
    - Function: The túngara frog is trying to build a home for its eggs.
    - Mechanisms: The frog secretes a foam that it uses to build the nest. The foam is produced in bursts, and the egg is deposited in the center of the nest.
    - Context: The frog builds the nest on water.
    - Part Of: The frog's body secretes the foam.
  + Notes:
    - The function, mechanism, and context are correct.
    - But, the mechanism could include more information.
    - The Part of the organism is not known because it is not stated in the text.
* W2138292607
  + Sample: A nocturnal mammal, the greater mouse-eared bat, calibrates a magnetic compass by the sun. recent evidence suggests that bats can detect the geomagnetic field, but the way in which this is used by them for navigation to a home roost remains unresolved. the geomagnetic field may be used by animals both to indicate direction and to locate position. in birds, directional information appears to be derived from an interaction of the magnetic field with either the sun or the stars, with some evidence suggesting that sunset/sunrise provides the primary directional reference by which a magnetic compass is calibrated daily. we demonstrate that homing greater mouse-eared bats (myotis myotis) calibrate a magnetic compass with sunset cues by testing their homing response after exposure to an altered magnetic field at and after sunset. magnetic manipulation at sunset resulted in a counterclockwise shift in orientation compared with controls, consistent with sunset calibration of the magnetic field, whereas magnetic manipulation after sunset resulted in no change in orientation. unlike in birds, however, the pattern of polarization was not necessary for the calibration. for animals that occupy ecological niches where the sunset is rarely observed, this is a surprising finding. yet it may indicate the primacy of the sun as an absolute geographical reference not only for birds but also within other vertebrate taxa.
  + Strategy:
    - Function: The greater mouse-eared bat is trying to calibrate a magnetic compass by the sun.
    - Mechanisms: The greater mouse-eared bat detects the geomagnetic field and uses it to navigate to a home roost.
    - Context: The greater mouse-eared bat is performing this function in a nocturnal environment.
    - Part Of: The greater mouse-eared bat's brain is performing the mechanism.
  + Notes:
    - The function, mechanism, and context are correct.
    - But, the mechanism could include more information.
    - The Part of the organism is not known because it is not stated in the text.
* W2005539166
  + Sample: "title": "Polarization sensitivity in two species of cuttlefish - Sepia plangon (Gray 1849) and Sepia mestus (Gray 1849) - demonstrated with polarized optomotor stimuli.", "abstract": "the existence of polarization sensitivity (ps), most likely resulting from the orthogonal arrangement of microvilli in photoreceptors, has been proposed in cephalopods for some time, although it has rarely been examined behaviourally. here, we tested the mourning cuttlefish, sepia plangon, and the reaper cuttlefish, sepia mestus, for polarization sensitivity using a large-field optomotor stimulus containing polarization contrast. polaroid filter drums with stripes producing alternating e-vectors were rotated around free-moving animals. polarized optomotor responses were displayed, and these responses were similar to those performed in response to a black-and-white, vertically-striped drum, whereas no responses were displayed to a plain polarizing control drum producing just a vertical e-vector. this indicates that the animals are able to see the contrast between adjacent stripes in the polarizing drum. to our knowledge, this is the first demonstration of functional polarization sensitivity in cuttlefish."
  + Strategy:
    - Function: The function of the organism is to be able to see the contrast between adjacent stripes in the polarizing drum.
    - Mechanisms: The mechanism of the organism is that it has polarizing filters in its photoreceptors that allow it to see the contrast between adjacent stripes.
    - Context: The context of the organism is that it is free-moving and able to see the polarizing optomotor stimulus.
    - Part Of:The part of the organism that is performing the mechanism is the photoreceptor.
  + Notes:
    - Correct!
* W2151557512
  + Sample: "title": "Identification and characterization of a multidomain hyperthermophilic cellulase from an archaeal enrichment.", "abstract": "archaea are microorganisms that use a wide range of carbon and energy sources. graham et al. describe an archaeal consortium that can grow at temperatures above 90 \u00b0c using crystalline cellulose as a carbon source, with potential applications in enzymatic degradation under extreme conditions."
  + Strategy:
    - Function: The function of the organism is to identify and characterize a multidomain hyperthermophilic cellulase from an archaeal enrichment.
    - Mechanisms: The mechanism of the organism is to use a wide range of carbon and energy sources.
    - Context: The context of the organism is to grow at temperatures above 90 °c using crystalline cellulose as a carbon source.
    - Part: The part of the organism that is performing the mechanism is the archaeal consortium.
  + Notes:
    - <https://pubmed.ncbi.nlm.nih.gov/21730956/>
      * Abstract may not be correct
    - The function is not correct, GPT takes the function of the paper, not the organism
    - The context should be the function
    - The mechanism is correct
    - The context should be extreme conditions
    - There is no part of the organism mentioned in the abstract
* W2160542693
  + Sample: "title": "DIFFERENCES IN POLYSACCHARIDE STRUCTURE BETWEEN CALCIFIED AND UNCALCIFIED SEGMENTS IN THE CORALLINE CALLIARTHRON CHEILOSPORIOIDES (CORALLINALES, RHODOPHYTA) 1", "abstract": "the articulated coralline calliarthron cheilosporioides manza produces segmented fronds composed of calcified segments (intergenicula) separated by uncalcified joints (genicula), which allow fronds to bend and reorient under breaking waves in the wave-swept intertidal zone. genicula are formed when calcified cells decalcify and restructure to create flexible tissue. the present study has identified important differences in the main agaran disaccharidic repeating units [\u21923)-\u03b2-d-galp (1\u2192 4)-\u03b1-l-galp(1\u2192] synthesized by genicular and intergenicular segments. based on chemical and spectroscopical analyses, we report that genicular cells from c. cheilosporioides biosynthesize a highly methoxylated galactan at c-6 position with low levels of branching with xylose side stubs on c-6 of the [\u21923)-\u03b2-d-galp (1\u2192] units, whereas intergenicular segments produce xylogalactans with high levels of xylose and low levels of 6-o-methyl \u03b2-d-gal units. these data suggest that, during genicular development, xylosyl branched, 3-linked \u03b2-d-galp units present in the xylogalactan backbones from intergenicular walls are mostly replaced by 6-o-methyl-d-galactose units. we speculate that this structural shift is a consequence of a putative and specific methoxyl transferase that blocks the xylosylation on c-6 of the 3-linked \u03b2-d-galp units. changes in galactan substitutions may contribute to the distinct mechanical properties of genicula and may lend insight into the calcification process in coralline algae."
  + Strategy:
    - Function: The organism is trying to create flexible tissue.
    - Mechanisms: The organism produces a highly methoxylated galactan at the c-6 position with low levels of branching and xylose side stubs.
    - Context: The organism is performing this function in the wave-swept intertidal zone.
    - Part of the organism: The genicular cells are performing the mechanism.
  + Notes:
    - The mechanism is incorrect, but everything else is correct.

**Conclusion 1**

* GPT does a great job extracting the summaries from the title and abstract.
* The issue is that some of the abstracts do not mention a body part. It also slightly modifies the results as compared to before.
* For this reason, I believe that the “part of” element should be a separate prompt.

**Prompt**

The function of the organism is what it is trying to accomplish.

Find the organism that is performing the function.

Find the part of the organism that is performing the function, if stated in the text. If it is not stated, print "None".

**Content**

Text: Building a home from foam\u2014t\u00fangara frog foam nest architecture and three-phase construction process. frogs that build foam nests floating on water face the problems of over-dispersion of the secretions used and eggs being dangerously exposed at the foam : air interface. nest construction behaviour of tungara frogs, engystomops pustulosus, has features that may circumvent these problems. pairs build nests in periodic bursts of foam production and egg deposition, three discrete phases being discernible. the first is characterized by a bubble raft without egg deposition and an approximately linear increase in duration of mixing events with time. this phase may reduce initial over-dispersion of foam precursor materials until a critical concentration is achieved. the main building phase is marked by mixing events and start-to-start intervals being nearly constant in duration. during the final phase, mixing events do not change in duration but intervals between them increase in an exponential-like fashion. pairs joining a colonial nesting abbreviate their initial phase, presumably by exploiting a pioneer pair's bubble raft, thereby reducing energy and material expenditure, and time exposed to predators. finally, eggs are deposited only in the centre of nests with a continuously produced, approximately 1 cm deep egg-free cortex that protectively encloses hatched larvae in stranded nests.

Organism: Tungara frog

Part: None

* W2103410568
  + Sample: "title": "Building a home from foam\u2014t\u00fangara frog foam nest architecture and three-phase construction process", "abstract": "frogs that build foam nests floating on water face the problems of over-dispersion of the secretions used and eggs being dangerously exposed at the foam : air interface. nest construction behaviour of tungara frogs, engystomops pustulosus, has features that may circumvent these problems. pairs build nests in periodic bursts of foam production and egg deposition, three discrete phases being discernible. the first is characterized by a bubble raft without egg deposition and an approximately linear increase in duration of mixing events with time. this phase may reduce initial over-dispersion of foam precursor materials until a critical concentration is achieved. the main building phase is marked by mixing events and start-to-start intervals being nearly constant in duration. during the final phase, mixing events do not change in duration but intervals between them increase in an exponential-like fashion. pairs joining a colonial nesting abbreviate their initial phase, presumably by exploiting a pioneer pair's bubble raft, thereby reducing energy and material expenditure, and time exposed to predators. finally, eggs are deposited only in the centre of nests with a continuously produced, approximately 1 cm deep egg-free cortex that protectively encloses hatched larvae in stranded nests."
  + Strategy:
    - Organism: Tungara frog
    - Part Of: None
  + Notes:
    - Correct
* W2138292607
  + Sample: A nocturnal mammal, the greater mouse-eared bat, calibrates a magnetic compass by the sun. recent evidence suggests that bats can detect the geomagnetic field, but the way in which this is used by them for navigation to a home roost remains unresolved. the geomagnetic field may be used by animals both to indicate direction and to locate position. in birds, directional information appears to be derived from an interaction of the magnetic field with either the sun or the stars, with some evidence suggesting that sunset/sunrise provides the primary directional reference by which a magnetic compass is calibrated daily. we demonstrate that homing greater mouse-eared bats (myotis myotis) calibrate a magnetic compass with sunset cues by testing their homing response after exposure to an altered magnetic field at and after sunset. magnetic manipulation at sunset resulted in a counterclockwise shift in orientation compared with controls, consistent with sunset calibration of the magnetic field, whereas magnetic manipulation after sunset resulted in no change in orientation. unlike in birds, however, the pattern of polarization was not necessary for the calibration. for animals that occupy ecological niches where the sunset is rarely observed, this is a surprising finding. yet it may indicate the primacy of the sun as an absolute geographical reference not only for birds but also within other vertebrate taxa.
  + Strategy:
    - Organism: the greater mouse-eared bat
    - Part Of: None
  + Notes:
    - Correct
* W2005539166
  + Sample: "title": "Polarization sensitivity in two species of cuttlefish - Sepia plangon (Gray 1849) and Sepia mestus (Gray 1849) - demonstrated with polarized optomotor stimuli.", "abstract": "the existence of polarization sensitivity (ps), most likely resulting from the orthogonal arrangement of microvilli in photoreceptors, has been proposed in cephalopods for some time, although it has rarely been examined behaviourally. here, we tested the mourning cuttlefish, sepia plangon, and the reaper cuttlefish, sepia mestus, for polarization sensitivity using a large-field optomotor stimulus containing polarization contrast. polaroid filter drums with stripes producing alternating e-vectors were rotated around free-moving animals. polarized optomotor responses were displayed, and these responses were similar to those performed in response to a black-and-white, vertically-striped drum, whereas no responses were displayed to a plain polarizing control drum producing just a vertical e-vector. this indicates that the animals are able to see the contrast between adjacent stripes in the polarizing drum. to our knowledge, this is the first demonstration of functional polarization sensitivity in cuttlefish."
  + Strategy:
    - Organism: Cuttlefish
    - Part Of: None
  + Notes:
    - Incorrect, the part should be photoreceptors
* W2151557512
  + Sample: "title": "Identification and characterization of a multidomain hyperthermophilic cellulase from an archaeal enrichment.", "abstract": "archaea are microorganisms that use a wide range of carbon and energy sources. graham et al. describe an archaeal consortium that can grow at temperatures above 90 \u00b0c using crystalline cellulose as a carbon source, with potential applications in enzymatic degradation under extreme conditions."
  + Strategy:
    - Organism: an archaeal consortium
    - Part: None
  + Notes:
    - Correct
* W2160542693
  + Sample: "title": "DIFFERENCES IN POLYSACCHARIDE STRUCTURE BETWEEN CALCIFIED AND UNCALCIFIED SEGMENTS IN THE CORALLINE CALLIARTHRON CHEILOSPORIOIDES (CORALLINALES, RHODOPHYTA) 1", "abstract": "the articulated coralline calliarthron cheilosporioides manza produces segmented fronds composed of calcified segments (intergenicula) separated by uncalcified joints (genicula), which allow fronds to bend and reorient under breaking waves in the wave-swept intertidal zone. genicula are formed when calcified cells decalcify and restructure to create flexible tissue. the present study has identified important differences in the main agaran disaccharidic repeating units [\u21923)-\u03b2-d-galp (1\u2192 4)-\u03b1-l-galp(1\u2192] synthesized by genicular and intergenicular segments. based on chemical and spectroscopical analyses, we report that genicular cells from c. cheilosporioides biosynthesize a highly methoxylated galactan at c-6 position with low levels of branching with xylose side stubs on c-6 of the [\u21923)-\u03b2-d-galp (1\u2192] units, whereas intergenicular segments produce xylogalactans with high levels of xylose and low levels of 6-o-methyl \u03b2-d-gal units. these data suggest that, during genicular development, xylosyl branched, 3-linked \u03b2-d-galp units present in the xylogalactan backbones from intergenicular walls are mostly replaced by 6-o-methyl-d-galactose units. we speculate that this structural shift is a consequence of a putative and specific methoxyl transferase that blocks the xylosylation on c-6 of the 3-linked \u03b2-d-galp units. changes in galactan substitutions may contribute to the distinct mechanical properties of genicula and may lend insight into the calcification process in coralline algae."
  + Strategy:
    - Organism: Coralline algae
    - Part of the organism: Genicular cells
  + Notes:
    - Correct

**Conclusion 2**

* ⅘ sample outputs are correct.
* GPT-3 always gets the organism correctly.