| Prompt | Organism | Part Of | Function | Context | Mechanism | Environment | Strategies |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Baseline | 29/29 | 28/29 | 30/30 | 26/30 | 28.5/30 |  | 29/30 |
| Mechanisms | 29/29 | 27/29 | 30/30 | 25/30 | 27.5/30 |  | 27/30 |
| Environment | 27/27 | 26/27 | 30/30 | 26/30 | 28.5/30 | 25/28 | 26/30 |
| Contexts | 30/30 | 29/30 | 30/30 | 26/30 | 28.5/30 |  | 27/30 |

1. W2130285640
   * Sample: "title": "Foam nest components of the t\u00fangara frog: a cocktail of proteins conferring physical and biological resilience", "abstract": "the foam nests of the tungara frog (engystomops pustulosus) form a biocompatible incubation medium for eggs and sperm while resisting considerable environmental and microbiological assault. we have shown that much of this behaviour can be attributed to a cocktail of six proteins, designated ranaspumins (rsn-1 to rsn-6), which predominate in the foam. these fall into two discernable classes based on sequence analysis and biophysical properties. rsn-2, with an amphiphilic amino acid sequence unlike any hitherto reported, exhibits substantial detergent-like surfactant activity necessary for production of foam, yet is harmless to the membranes of eggs and spermatozoa. a further four (rsn-3 to rsn-6) are lectins, three of which are similar to fucolectins found in teleosts but not previously identified in a land vertebrate, though with a carbohydrate binding specificity different from previously described fucolectins. the sixth, rsn-1, is structurally similar to proteinase inhibitors of the cystatin class, but does not itself appear to exhibit any such activity. the nest foam itself, however, does exhibit potent cystatin activity. rsn-encoding genes are transcribed in many tissues of the adult frogs, but the full cocktail is present only in oviduct glands. combinations of lectins and cystatins have known roles in plants and animals for defence against microbial colonization and insect attack. tungara nest foam displays a novel synergy of selected elements of innate defence plus a specialized surfactant protein, comprising a previously unreported strategy for protection of unattended reproductive stages of animals."
     + Baseline (6/6):
       - Organism: Túngara frog
       - Part Of: Oviduct glands
       - Function: to form a biocompatible incubation medium for eggs and sperm
       - Mechanism: a cocktail of six proteins
       - Context: while resisting considerable environmental and microbiological assault
       - Strategy: Túngara frogs form a biocompatible incubation medium for eggs and sperm by producing a cocktail of six proteins in their oviduct glands.
     + Baseline + Environment (7/7):
       - Organism: Túngara frog
       - Part Of: Oviduct glands
       - Function: to form a biocompatible incubation medium (for sperm and eggs)
       - Mechanism: a cocktail of six proteins
       - Environment: the nests of the túngara frog
       - Context: while resisting considerable environmental and microbiological assault
       - Strategy: Túngara frogs form a biocompatible incubation medium (for eggs and sperm) by producing a cocktail of six proteins in their oviduct glands.
     + Baseline + Contexts (6/6):
       - Organism: Túngara frog
       - Part Of: Nests
       - Function :to protect unattended reproductive stages
       - Mechanism: a cocktail of six proteins
       - Context(s): Oviduct glands
       - Strategy: Túngara frogs protect unattended reproductive stages by producing a cocktail of proteins in their oviduct glands.
     + Baseline + Mechanisms (⅚):
       - Organism: Túngara frog
       - Part Of: Oviduct glands
       - Function: to form a biocompatible incubation medium for eggs and sperm
       - Mechanisms: a cocktail of six proteins
       - Context: **the foam nests of the túngara frog**
       - Strategy: Túngara frogs form a biocompatible incubation medium for eggs and sperm by producing a cocktail of six proteins in their oviduct glands.
     + The best prompt is the baseline prompt because it has a better context and a complete function in the respective output.
       - Function: to form a biocompatible incubation medium for eggs and sperm
       - Context: while resisting considerable environmental and microbiological assault
2. W2168114966
   * Sample: "title": "The suctorial organ of the Solifugae (Arachnida, Solifugae)", "abstract": "the ability of members of the arachnid order solifugae to climb smooth, vertical surfaces and the organs involved in this behavior are investigated. macroscopic, microscopic, and scanning electron microscopic observations are made of a palpal organ called the suctorial organ. observations of the behavior but not the microstructure have been made in the past. histological examination illustrates the internal gross anatomy of this structure and scanning electron microscopy demonstrates the fine structure in adults of four genera: eremobates (eremobatidae), eremochelis (eremobatidae), eremorhax (eremobatidae), ammotrechula (ammotrechidae), as well as an unidentified late stage immature and third stage instar. the suctorial organ is most likely primarily used for prey capture in the wild. q 2005 elsevier ltd. all rights reserved."
     + Baseline (6/6):
       - Organism: Solifugae
       - Part Of: Suctorial organ
       - Function: prey capture
       - Mechanism: suction
       - Context: in the wild
       - Strategy: Solifugae use suction to capture prey in the wild
     + Baseline + Environment (7/7):
       - Organism: Solifugae
       - Part Of: Suctorial organ
       - Function: prey capture
       - Mechanism: suction
       - Environment: in the wild
       - Context: smooth, vertical surfaces
       - Strategy: Solifugae capture prey by suctioning onto smooth, vertical surfaces in the wild.
     + Baseline + Contexts (6/6):
       - Organism: Solifugae
       - Part Of: Suctorial organ
       - Function: prey capture
       - Mechanism: suction
       - Context(s): smooth, vertical surfaces
       - Strategy: Solifugae capture prey by suctioning onto smooth, vertical surfaces
     + Baseline + Mechanisms (6/6)::
       - Organism: Solifugae
       - Part Of: Suctorial organ
       - Function: prey capture
       - Mechanism: suction
       - Context: **smooth, vertical surfaces**
       - Strategy: Solifugae use suction to capture prey on smooth, vertical surfaces.
     + The best prompt is a tie between the Baseline and Baseline + Mechanisms prompt. The reason that the other prompts are not as strong is because their output strategy contains “ capture prey by suctioning onto smooth, …”. This is not necessarily the case: the Solifugae captures prey by suction, not suctioning onto smooth surfaces. Additionally, the best prompts have nothing wrong in their generated outputs.
3. W1589686983
   * Sample: "title": "On the Mound of Macrotermes michaelseni as an Organ of Respiratory Gas Exchange", "abstract": "patterns and rates of air movements in the mounds and nests of macrotermes michaelseni were studied using tracer methods. wind is a significant source of energy for powering nest ventilation, despite the mound being a completely enclosed structure. nests are ventilated by a tidal movement of air driven by temporal variation in wind speed and wind direction. density gradients sufficiently steep to drive bulk flow by natural convection will be rare. however, metabolism-induced buoyant forces may interact with wind energy in a way that promotes homeostasis of the mound atmosphere."
     + Baseline (6/6):
       - Organism: Macrotermes michaelseni
       - Part Of: Mound
       - Function: Homeostasis of the mound atmosphere
       - Mechanism: Wind energy
       - Context: Temporal variation in wind speed and wind direction
       - Strategy: The mound of Macrotermes michaelseni is an organ of respiratory gas exchange that is powered by wind energy and maintains homeostasis of the mound atmosphere.
     + Baseline + Environment (7/7):
       - Organism: Macrotermes michaelseni
       - Part Of: Mound
       - Function: Homeostasis of the mound atmosphere
       - Mechanism: Wind energy
       - Environment: inside the mound
       - Context: Temporal variation in wind speed and wind direction
       - Strategy: The mound of Macrotermes michaelseni is an organ of respiratory gas exchange that is that uses wind energy to maintain homeostasis of the mound atmosphere.
     + Baseline + Contexts (6/6):
       - Organism: Macrotermes michaelseni
       - Part Of: Mound
       - Function: Homeostasis of the mound atmosphere
       - Mechanism: Wind energy
       - Context: Temporal variation in wind speed and wind direction
       - Strategy: The mound of Macrotermes michaelseni is used as an organ of respiratory gas exchange that by promoting homeostasis of the mound atmosphere with wind energy.
     + Baseline + Mechanisms (⅚):
       - Organism: Macrotermes michaelseni
       - Part Of: Mound
       - Function: Homeostasis of the mound atmosphere
       - Mechanisms: Wind energy, **metabolism-induced buoyant forces**
       - Context: **Mounds of Macrotermes michaelseni**
       - Strategy: The mound of Macrotermes michaelseni is an organ of respiratory gas exchange that by using wind energy and metabolism-induced buoyant forces to promote homeostasis of the mound atmosphere.
     + The best prompts are between the Baseline, Baseline + Environment, and Baseline + Contexts. This is because the generated outputs for all prompts are correct.
4. W1589686983
   * Sample: "title": "A multi-enzyme cascade of hemoglobin proteolysis in the intestine of blood-feeding hookworms.", "abstract": "blood-feeding pathogens digest hemoglobin (hb) as a source of nutrition, but little is known about this process in multicellular parasites. the intestinal brush border membrane of the canine hookworm, ancylostoma caninum, contains aspartic proteases (apr-1), cysteine proteases (cp-2), and metalloproteases (mep-1), the first of which is known to digest hb. we now show that hb is degraded by a multi-enzyme, synergistic cascade of proteolysis. recombinant apr-1 and cp-2, but not mep-1, digested native hb and denatured globin. mep-1, however, did cleave globin fragments that had undergone prior digestion by apr-1 and cp-2. proteolytic cleavage sites within the hb \u03b1 and \u03b2 chains were determined for the three enzymes, identifying a total of 131 cleavage sites. by scanning synthetic combinatorial peptide libraries with each enzyme, we compared the preferred residues cleaved in the libraries with the known cleavage sites within hb. the semi-ordered pathway of hb digestion described here is surprisingly similar to that used by plasmodium to digest hb and provides a potential mechanism by which these hemoglobinases are efficacious vaccines in animal models of hookworm infection."
     + Baseline (⅚):
       - Organism: Hookworm
       - Part Of: brush border membrane
       - Function: digest hemoglobin
       - Mechanism: aspartic proteases, cysteine proteases, and metalloproteases
       - Context: intestinal brush border membrane
       - Strategy: Hookworms digest hemoglobin by using aspartic proteases, cysteine proteases, and metalloproteases in their intestinal brush border membrane.
     + Baseline + Environment (5/7):
       - Organism: Hookworm
       - Part Of: digestive system
       - Function: digest hemoglobin
       - Mechanism: aspartic proteases, cysteine proteases, and metalloproteases
       - Environment: blood-feeding pathogens
       - Context: intestinal brush border membrane
       - Strategy: Hookworms digest hemoglobin by aspartic proteases, cysteine proteases, and metalloproteases in their intestinal brush border membrane.
     + Baseline + Contexts (6/6):
       - Organism: Hookworm
       - Part Of: aspartic proteases, cysteine proteases, and metalloproteases
       - Function: digest hemoglobin
       - Mechanism: proteolytic cascade
       - Context: intestinal brush border membrane
       - Strategy: Hookworms digest hemoglobin by proteolytic cascade on the intestinal brush border membrane.
     + Baseline + Mechanisms (⅚):
       - Organism: Hookworm
       - Part Of: brush border membrane
       - Function: digest hemoglobin
       - Mechanisms: aspartic proteases, cysteine proteases, and metalloproteases
       - Context: intestinal brush border membrane
       - Strategy: Hookworms digest hemoglobin by using aspartic proteases, cysteine proteases, and metalloproteases in their intestinal brush border membrane.
     + The context for this prompt is tricky. It could be “intestinal brush border membrane” or “blood-feeding pathogens”, depending on what GPT finds as the part of the organism. With the prompts that have “brush border membrane” as both the part of and context of an output, I consider the context incorrect because this is duplicated information. The optimal context, in this case, should be “blood-feeding pathogens”.
     + But, with the Baseline + contexts prompt, the “part of” output contains only proteases within the hookworm's intestinal membrane, so the context is still correct. Therefore, this is the best prompt.
5. W2052657884
   * Sample: "title": "The Diversity of Hydrostatic Skeletons", "abstract": "a remarkably diverse group of organisms rely on a hydrostatic skeleton for support, movement, muscular antagonism and the amplification of the force and displacement of muscle contraction. in hydrostatic skeletons, force is transmitted not through rigid skeletal elements but instead by internal pressure. functioning of these systems depends on the fact that they are essentially constant in volume as they consist of relatively incompressible fluids and tissue. contraction of muscle and the resulting decrease in one of the dimensions thus results in an increase in another dimension. by actively (with muscle) or passively (with connective tissue) controlling the various dimensions, a wide array of deformations, movements and changes in stiffness can be created. an amazing range of animals and animal structures rely on this form of skeletal support, including anemones and other polyps, the extremely diverse wormlike invertebrates, the tube feet of echinoderms, mammalian and turtle penises, the feet of burrowing bivalves and snails, and the legs of spiders. in addition, there are structures such as the arms and tentacles of cephalopods, the tongue of mammals and the trunk of the elephant that also rely on hydrostatic skeletal support but lack the fluid-filled cavities that characterize this skeletal type. although we normally consider arthropods to rely on a rigid exoskeleton, a hydrostatic skeleton provides skeletal support immediately following molting and also during the larval stage for many insects. thus, the majority of animals on earth rely on hydrostatic skeletons."
     + Baseline (6/6):
       - Organism: anemones, wormlike invertebrates, tube feet of echinoderms, mammalian and turtle penises, feet of burrowing bivalves and snails, legs of spiders
       - Part Of: fluid-filled cavities
       - Function: support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction
       - Mechanism: internal pressure
       - Context: animals and animal structures
       - Strategy: animals rely on hydrostatic skeletons for support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction by using internal pressure to control the various dimensions
     + Baseline + Environment (4/7):
       - Organism: anemones, wormlike invertebrates, tube feet of echinoderms, mammalian and turtle penises, feet of burrowing bivalves and snails, legs of spiders
       - Part Of:
       - Function: support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction
       - Mechanism: internal pressure
       - Environment:
       - Context: contraction of muscle
       - Strategy: animals rely on hydrostatic skeletons for support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction by using internal pressure to control the various dimensions
     + Baseline + Contexts (6/6):
       - Organism: anemones, wormlike invertebrates, tube feet of echinoderms, mammalian and turtle penises, feet of burrowing bivalves and snails, legs of spiders
       - Part Of: fluid-filled cavities
       - Function: support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction
       - Mechanism: internal pressure
       - Context: animals and animal structures
       - Strategy: animals rely on hydrostatic skeletons for support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction by internal pressure
     + Baseline + Mechanisms (⅚):
       - Organism: anemones, wormlike invertebrates, tube feet of echinoderms, mammalian and turtle penises, feet of burrowing bivalves and snails, legs of spiders
       - Part Of: **arms and tentacles of cephalopods, tongue of mammals, trunk of the elephant**
       - Function: support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction
       - Mechanism: **contraction of muscle**
       - Context: animals and animal structures
       - Strategy: animals and animal structures rely on hydrostatic skeletons by contracting muscle to create a wide array of deformations, movements and changes in stiffness.
     + The best prompt is the baseline prompt because it has correct generated outputs and the strongest strategy.
6. W2005779387
   * Sample: "title": "On the buoyancy of the pearly nautilus", "abstract": "nautilus macromphalus sowerby when freshly caught was close to neutral buoyancy having a weight in sea water of about 0\u20132% of its weight in air. the animals without their shells varied considerably in density but the volume of the shell was an approximately constant fraction of the total volume of the whole animal and whole animals were brought approximately to the same density by havingmore or less liquid inside the chambers of the shell. about 80 % of the gas space in the shell was used to support the weight of the shell itself in sea water.in an adult animal the centre of buoyancy was found to be about 6 mm above the centre of gravity, which made the animal very stable in its natural swimming position, a couple of about 350 g. cm being required to turn it through 90\u00b0. the pearly partsof the chamber walls were impermeable to sea water but the chalky and horny siphuncular tubes joining the septal necks were very porous. the most newly formed tenor so chambers were the only ones to contain liquids in appreciable volume and theydid this in diminishing amounts from the newest to the oldest. the watery liquids found within the chambers were always hypotonic to sea water and sometimes markedly so; they contained principally sodium and chloride ions. one animal was in the process of forming a new chamber, this incomplete chamber was completely full of liquidwith an osmolarity close to that of sea water but differing in composition from seawater."
     + Baseline (⅚):
       - Organism: pearly nautilus
       - Part Of: shell
       - Function: support the weight of the shell
       - Mechanism: having more or less liquid inside the chambers of the shell
       - Context: in an adult animal
       - Strategy: pearly nautilus support the weight of the shell by having more or less liquid inside the chambers of the shell.
     + Baseline + Environment (7/7):
       - Organism: nautilus
       - Part Of: shell
       - Function: support the weight of the shell
       - Mechanism: having more or less liquid inside the chambers of the shell
       - Environment: in sea water
       - Context: when freshly caught
       - Strategy: Nautilus support the weight of the shell by having more or less liquid inside the chambers of the shell when freshly caught in sea water
     + Baseline + Contexts (4/6):
       - Organism: Nautilus macromphalus sowerby
       - Part Of: whole animal
       - Function: maintain buoyancy
       - Mechanism: having a weight in sea water that is a small percentage of its weight in air
       - Context(s): when freshly caught
       - Strategy: Nautilus macromphalus sowerby maintains buoyancy by having a weight in sea water that is a small percentage of its weight in air.
     + Baseline + Mechanisms (6/6):
       - Organism: pearly nautilus
       - Part Of: **shell**
       - Function: **maintain buoyancy**
       - Mechanisms: **having a weight in sea water of about 0–2% of its weight in air, using gas space in the shell to support the weight of the shell in sea water**
       - Context: **in sea water**
       - Strategy: Pearly nautilus maintains buoyancy by having a weight in sea water of about 0–2% of its weight in air and using gas space in the shell to support the weight of the shell in sea water.
     + The strongest strategy is the Baseline + Mechanisms strategy because it produces the most informative mechanism. Thus, this is the best prompt.
7. W2152749757
   * Sample: “title": "How strong is intracanopy leaf plasticity in temperate deciduous trees", "abstract": "intracanopy plasticity in tree leaf form is a major determinant of whole-plant function and potentially of forest understory ecology. however, there exists little systematic information for the full extent of intracanopy plasticity, whether it is linked with height and exposure, or its variation across species. for arboretum-grown trees of six temperate deciduous species averaging 13-18 m in height, we quantified intracanopy plasticity for 11 leaf traits across three canopy locations (basal-interior, basal-exterior, and top). plasticity was pronounced across the canopy, and maximum likelihood analyses indicated that plasticity was primarily linked with irradiance, regardless of height. intracanopy plasticity (the quotient of values for top and basal-interior leaves) was often similar across species and statistically indistinguishable across species for several key traits. at canopy tops, the area of individual leaves was on average 0.5-0.6 times that at basal-interior, stomatal density 1.1-1.5 times higher, sapwood cross-sectional area up to 1.7 times higher, and leaf mass per area 1.5-2.2 times higher; guard cell and stomatal pore lengths were invariant across the canopy. species differed in intracanopy plasticity for the mass of individual leaves, leaf margin dissection, ratio of leaf to sapwood areas, and stomatal pore area per leaf area; plasticity quotients ranged only up to \u22482. across the six species, trait plasticities were uncorrelated and independent of the magnitude of the canopy gradient in irradiance or height and of the species' light requirements for regeneration. this convergence across species indicates general optimization or constraints in development, resulting in a bounded plasticity that improves canopy performance."
     + Baseline (4/6):
       - Organism: temperate deciduous trees
       - Part Of: leaf
       - Function: improve canopy performance
       - Mechanism: plasticity in tree leaf form
       - Context: arboretum-grown trees
       - Strategy: Temperate deciduous trees improve canopy performance by plasticity in tree leaf form.
     + Baseline + Environment (6/7):
       - Organism: temperate deciduous trees
       - Part Of: leaf
       - Function: improve canopy performance
       - Mechanism: intracanopy plasticity
       - Environment: arboretum
       - Context: tree leaf form
       - Strategy: Temperate deciduous trees improve canopy performance by plasticity in tree leaf form.
     + Baseline + Contexts (5/6):
       - Organism: temperate deciduous trees
       - Part Of: leaf
       - Function: improve canopy performance
       - Mechanism: plasticity in tree leaf form
       - Context(s): arboretum-grown trees
       - Strategy: Plasticity in tree leaf form is a major determinant of whole-plant function and potentially of forest understory ecology.
     + Baseline + Mechanisms (4/6):
       - Organism: temperate deciduous trees
       - Part Of: leaf
       - Function: improve canopy performance
       - Mechanisms: **intracanopy** plasticity in tree leaf form
       - Context: arboretum-grown trees
       - Strategy: Temperate deciduous trees improve canopy performance by plasticity in tree leaf form.
     + The best prompt is between the Baseline + Contexts prompt and the Baseline + Environment prompt. The Baseline + Environment prompt gets the correct context from the sample, but the Baseline + Contexts prompt gets the better strategy. Although, most of this strategy is not present in the main elements that GPT-3 must extract before forming the strategy. Therefore, I will count this as a tie.
8. W2025490238
   * Sample: "title": "A biomechanical perspective on the role of large stem volume and high water content in baobab trees (Adansonia spp.; Bombacaceae)", "abstract": "the stems of large trees serve in transport, storage, and support; however, the degree to which these roles are reflected in their morphology is not always apparent. the large, water-filled stems of baobab trees (adansonia spp.) are generally assumed to serve a water storage function, yet recent studies indicate limited use of stored water. through an analysis of wood structure and composition, we examined whether baobab morphology reflects biomechanical constraints rather than water storage capacity in the six madagascar baobab species. baobab wood has a high water content (up to 79%), low wood density (0.09-0.17 g \u00b7 cm(-3)), high parenchyma content (69-88%), and living cells beyond 35 cm into the xylem from the cambium. volumetric construction cost of the wood is several times lower than in more typical trees, and the elastic modulus approaches that of parenchyma tissue. safety factors calculated from estimated elastic buckling heights were low, indicating that baobabs are not more overbuilt than other temperate and tropical trees, yet the energy investment in stem material is comparable to that in temperate deciduous trees. furthermore, the elastic modulus of the wood decreases with water content, such that excessive water withdrawal from the stem could affect mechanical stability.
     + Baseline (6/6):
       - Organism: baobab tree
       - Part Of: wood
       - Function: support
       - Mechanism: large, water-filled stems
       - Context: water storage
       - Strategy: The large, water-filled stems of baobab trees support the tree by serving as a water storage mechanism.
     + Baseline + Environment (7/7):
       - Organism: baobab tree
       - Part Of: stem
       - Function: support
       - Mechanism: large, water-filled stems
       - Environment: Madagascar
       - Context: water storage
       - Strategy: Baobab trees support themselves with large, water-filled stems that store water.
     + Baseline + Contexts (4/6):
       - Organism: baobab tree
       - Part Of: stem
       - Function: support
       - Mechanism: large, water-filled stems
       - Context(s): madagascar baobab species
       - Strategy: baobab trees support madagascar baobab species with large, water-filled stems
     + Baseline + Mechanisms (3/6):
       - Organism: baobab tree
       - Part Of: wood
       - Function: support
       - Mechanisms: **large stem volume** and **high water content**
       - Context: **madagascar baobab species**
       - Strategy: baobab trees support madagascar baobab species with large stem volume and high water content
     + A caveat with this prompt is that the function extracted may not be correct in the end. Throughout the whole abstract, they discuss that previous intuition was that the water-filled stems were used for water storage. The prompt very briefly goes over the fact that the stems are probably used for mechanical support.
     + Thus, I count the above outputs of the prompts as correct even though they probably aren’t because they mention the main function as water storage.
       - But, the correct strategy should probably be
         * The large, water-filled stems of baobab trees support the tree with mechanical stability rather than serving as a water storage mechanism.
     + GPT-3 usually has a tough time with these kinds of abstracts for this group of prompts.
     + The best prompt is a tie between the Baseline and Baseline + Environment prompt.
9. W2112209842
   * Sample: "title": "Hydrophobic trichome layers and epicuticular wax powders in Bromeliaceae", "abstract": "the distinctive foliar trichome of bromeliaceae has promoted the evolution of an epiphytic habit in certain taxa by allowing the shoot to assume a significant role in the uptake of water and mineral nutrients. despite the profound ecophysiological and taxonomic importance of this epidermal structure, the functions of nonabsorbent trichomes in remaining bromeliaceae are not fully understood. the hypothesis that light reflection from these trichome layers provides photoprotection was not supported by spectroradiometry and fluorimetry in the present study; the mean reflectance of visible light from trichome layers did not exceed 6.4% on the adaxial surfaces of species representing a range of ecophysiological types nor was significant photoprotection provided by their presence. several reports suggesting water repellency in some terrestrial bromeliaceae were investigated. scanning electron microscopy (sem) and a new technique-fluorographic dimensional imaging (fdi)-were used to assess the interaction between aqueous droplets and the leaf surfaces of 86 species from 25 genera. in the majority of cases a dense layer of overlapping, stellate or peltate trichomes held water off the leaf epidermis proper. in the case of hydrophobic tank-forming tillandsioideae, a powdery epicuticular wax layer provided water repellency. the irregular architecture of these indumenta resulted in relatively little contact with water droplets. most mesic terrestrial pitcairnioideae examined either possessed glabrous leaf blades or hydrophobic layers of confluent trichomes on the abaxial surface. thus, the present study indicates that an important ancestral function of the foliar trichome in bromeliaceae was water repellency. the ecophysiological consequences of hydrophobia are discussed."
     + Baseline (⅚):
       - Organism: Bromeliaceae
       - Part Of: leaf epidermis
       - Function: water repellency
       - Mechanism: dense layer of overlapping, stellate or peltate trichomes
       - Context: majority of cases
       - Strategy: the foliar trichome in bromeliaceae provides water repellency by creating a dense layer of overlapping, stellate or peltate trichomes on the leaf epidermis.
     + Baseline + Environment (6/7):
       - Organism: Bromeliaceae
       - Part Of: leaf epidermis
       - Function: water repellency
       - Mechanism: dense layer of overlapping, stellate or peltate trichomes
       - Environment: on the leaf epidermis
       - Context: majority of cases
       - Strategy: the foliar trichome in bromeliaceae provides water repellency by creating a dense layer of overlapping, stellate or peltate trichomes on the leaf epidermis.
     + Baseline + Contexts (6/6):
       - Organism: Bromeliaceae
       - Part Of: leaf
       - Function: water repellency
       - Mechanism: dense layer of overlapping, stellate or peltate trichomes
       - Context: on the leaf epidermis
       - Strategy: Bromeliaceae repell water by having a dense layer of overlapping, stellate or peltate trichomes on the leaf epidermis.
     + Baseline + Mechanisms (6/6):
       - Organism: Bromeliaceae
       - Part Of: **trichome**
       - Function: water repellency
       - Mechanisms: dense layer of overlapping, stellate or peltate trichomes
       - Context: **on the leaf epidermis**
       - Strategy: Bromeliaceae repell water by having a dense layer of overlapping, stellate or peltate trichomes on the leaf epidermis.
     + The best prompt is either the Baseline + Contexts prompt or the Baseline + Mechanisms prompt. The part of the organism that is extracted is correct for both these prompts, although different. Therefore, it is a tie.
10. W2127657288
    * Sample: "title": "The incidence and implications of clouds for cloud forest plant water relations.", "abstract": "although clouds are the most recognisable and defining feature of tropical montane cloud forests, little research has focussed on how clouds affect plant functioning. we used satellite and ground-based observations to study cloud and leaf wetting patterns in contrasting tropical montane and pre-montane cloud forests. we then studied the consequences of leaf wetting for the direct uptake of water accumulated on leaf surfaces into the leaves themselves. during the dry season, the montane forest experienced higher precipitation, cloud cover and leaf wetting events of longer duration than the pre-montane forest. leaf wetting events resulted in foliar water uptake in all species studied. the capacity for foliar water uptake differed significantly between the montane and pre-montane forest plant communities, as well as among species within a forest. our results indicate that foliar water uptake is common in these forest plants and improves plant water status during the dry season.
      + Baseline (6/6):
        - Organism: tropical montane and pre-montane cloud forest plants
        - Part Of: leaves
        - Function: improve plant water status
        - Mechanism: foliar water uptake
        - Context: during the dry season
        - Strategy: Foliar water uptake is common in tropical montane and pre-montane cloud forest plants and improves plant water status during the dry season.
      + Baseline + Environment (7/7):
        - Organism: plants
        - Part Of: leaves
        - Function: improve plant water status
        - Mechanism: foliar water uptake
        - Environment: tropical montane and pre-montane cloud forests
        - Context: during the dry season
        - Strategy: Foliar water uptake is common in tropical montane and pre-montane cloud forest plants and improves plant water status during the dry season.
      + Baseline + Contexts (6/6):
        - Organism: tropical montane and pre-montane cloud forest plants
        - Part Of: leaves
        - Function: improve plant water status
        - Mechanism: foliar water uptake
        - Context: during the dry season
        - Strategy: Tropical montane and pre-montane cloud forest plants improve plant water status during the dry season by foliar water uptake.
      + Baseline + Mechanisms (6/6):
        - Organism: tropical montane and pre-montane cloud forest plants
        - Part Of: leaves
        - Function: improve plant water status
        - Mechanisms: foliar water uptake
        - Context: during the dry season
        - Strategy: Foliar water uptake is common in tropical montane and pre-montane cloud forest plants and improves plant water status during the dry season.
      + There is a 3-way tie between the Baseline, Baseline + Contexts, and Basleine + Mechanisms strategy. They are very similar.
11. W2024134236
    * Sample: "title": "Functional morphology of scale hinges used to transport water: convergent drinking adaptations in desert lizards (Moloch horridus and Phrynosoma cornutum)", "abstract": "the australian thorny devil, moloch horridus gray, 1841, and the texas horned lizard, phrynosoma cornutum harlan, 1825, have the remarkable ability to rapidly move water through interscalar spaces on their skin\u2019s surface to their mouth for drinking. the morphology of these scale hinges has not been studied. we used histological and sem techniques to examine and compare the scale hinges of both species. additional taxa in their respective lineages were examined in order to evaluate the potential that convergent evolution has occurred. in the two species that transport water, each scale hinge has a basally expanded and semi-enclosed channel formed by the hinge joint that is interconnected with all scale hinges on the body. we hypothesize that it is within this semi-tubular channel system of hinge joints, where the \u03b2-layer keratin of the integument is very thin, that water is transported. hinge joint walls are covered by a complex topography of fractured surfaces that greatly expand the channel\u2019s surface area and probably enhance capillary transport of water. in addition, we note differing morphology of scale surfaces at the rear of the jaws of both species. we hypothesize that capillary forces fill the scale-hinge system and additional forces, generated within the mouth by observed motions during drinking, depress local water-pressure to pull water through the channels of the hinge-joint system. we conclude that the combined features in the two species, semi-tubular hinge-joint channels with convoluted walls and a jaw-buccal cavity pumping-mechanism, have convergently evolved for capture, transport, and drinking of water from sporadic rainfall."
      + Baseline (6/6):
        - Organism: Thorny devil and Texas horned lizard
        - Part Of: Scale hinge
        - Function: capture, transport, and drink water
        - Mechanism: semi-tubular hinge-joint channels
        - Context: interscalar spaces on their skin's surface
        - Strategy: Thorny devils and Texas horned lizards capture, transport, and drink water by using semi-tubular hinge-joint channels to move water through interscalar spaces on their skin's surface to their mouth.
      + Baseline + Environment (7/7):
        - Organism: Thorny devil and Texas horned lizard
        - Part Of: Scale hinge
        - Function: capture, transport, and drink water
        - Mechanism: semi-tubular hinge-joint channels
        - Environment: desert
        - Context: interscalar spaces
        - Strategy: Thorny devil and Texas horned lizard use semi-tubular hinge-joint channels to capture, transport, and drink water from sporadic rainfall in the desert.
      + Baseline + Contexts (6/6):
        - Organism: Thorny devil and Texas horned lizard
        - Part Of: Scale
        - Function: capture, transport, and drink water
        - Mechanism: semi-tubular hinge-joint channels
        - Context(s): desert
        - Strategy: Thorny devil and Texas horned lizard use semi-tubular hinge-joint channels to capture, transport, and drink water from sporadic rainfall in the desert.
      + Baseline + Mechanisms (6/6):
        - Organism: Thorny devil and Texas horned lizard
        - Part Of: Scale hinge
        - Function: capture, transport, and drink water
        - Mechanisms: semi-tubular hinge-joint channels and **a jaw-buccal cavity pumping-mechanism**
        - Context: **from sporadic rainfall**
        - Strategy: Thorny devils and Texas horned lizards capture, transport, and drink water by using semi-tubular hinge-joint channels and a jaw-buccal cavity pumping-mechanism
      + All the outputs from the prompts are correct.
      + The Baseline + Mechanisms prompt has the best Mechanism. It also gets a strong context.
      + But, in the end, the Baseline + Environment prompt is the best because of the fact that it extracts the environment correctly and the context correctly; these “contexts” encompass both the contexts in the Baseline and Baseline + Contexts prompts, while maintaining a strong strategy.
      + Thus, the best prompts are the Baseline + Mechanisms and Baseline + Environment
12. W2075613570
    * Sample: "title": "Function of spiral grain in trees", "abstract": "through spiral grain, conduits for sap lead from each root to all branches. this uniform distribution of sap is indicated by the paths of vessels and tracheids, and has been proven experimentally by means of dyed sap injected into the base of stems or taken up by roots. trees receiving water only from roots at one side of the root collar nevertheless stay green and continue growing. spiral grain in bark distributes food from each branch to other flanks of the stem and to most roots. experimental interruptions of the sap and food conduits caused the cambial zone to reorient new conduit cells in new directions, bypassing the interruption. in particular, spiral grooves cut into the stem surface caused spiral grain. the new cells reorient through division and growth. although spiral grain is largely under genetic control, trees appear to have a spiral grain especially where needed for distribution of water when root spheres are dry at one side. compared with straight-grained trees, spiral-grained stems and branches bend and twist more when exposed to strong wind, in this way offering less wind resistance and being less likely to break. through the bending and twisting, snow slides down from branches rather than breaking them, but the main function of spiral grain is the uniform distribution of supplies from each root to all branches, and from each branch to many roots."
      + Baseline (6/6):
        - Organism: trees
        - Part Of: stem and bark
        - Function: uniform distribution of supplies
        - Mechanism: spiral grain
        - Context: from each root to all branches and from each branch to many roots
        - Strategy: trees distribute supplies evenly by spiral grain from each root to all branches and from each branch to many roots
      + Baseline + Environment (7/7):
        - Organism: trees
        - Part Of: stem and bark
        - Function: uniform distribution of supplies
        - Mechanism: spiral grain
        - Environment: in trees
        - Context: from each root to all branches and from each branch to many roots
        - Strategy: trees have a spiral grain in their stem and bark in order to have a uniform distribution of supplies from each root to all branches and from each branch to many roots.
      + Baseline + Contexts (6/6):
        - Organism: trees
        - Part Of: stem and branches
        - Function: uniform distribution of supplies
        - Mechanism: spiral grain
        - Context: from each root to all branches and from each branch to many roots
        - Strategy: trees distribute supplies evenly by spiral grain from each root to all branches and from each branch to many roots
      + Baseline + Mechanisms (6/6):
        - Organism: trees
        - Part Of: stem and bark
        - Function: uniform distribution of supplies
        - Mechanisms: spiral grain **in bark**
        - Context: from each root to all branches and from each branch to many roots
        - Strategy: trees have spiral grain **in bark** to distribute supplies from each root to all branches and from each branch to many roots
      + While all the prompts are correct, the Baseline + Environment prompt output is the most specific.
13. W2071362227
    * Sample: "title": "Bacterial Recognition of Mineral Surfaces: Nanoscale Interactions Between Shewanella and \u03b1-FeOOH", "abstract": "force microscopy has been used to quantitatively measure the infinitesimal forces that characterize interactions between shewanella oneidensis (a dissimilatory metal-reducing bacterium) and goethite (alpha-feooh), both commonly found in earth near-surface environments. force measurements with subnanonewton resolution were made in real time with living cells under aerobic and anaerobic solutions as a function of the distance, in nanometers, between a cell and the mineral surface. energy values [in attojoules (10(-18) joules)] derived from these measurements show that the affinity between s. oneidensis and goethite rapidly increases by two to five times under anaerobic conditions in which electron transfer from bacterium to mineral is expected. specific signatures in the force curves suggest that a 150-kilodalton putative iron reductase is mobilized within the outer membrane of s. oneidensis and specifically interacts with the goethite surface to facilitate the electron transfer process."
      + Baseline (4/6):
        - Organism: Shewanella oneidensis
        - Part Of: Outer membrane
        - Function: facilitate electron transfer
        - Mechanism: force measurements
        - Context: real time with living cells under aerobic and anaerobic solutions
        - Strategy: Shewanella oneidensis facilitates electron transfer by force measurements with living cells under aerobic and anaerobic solutions.
      + Baseline + Environment (5/7):
        - Organism: Shewanella oneidensis
        - Part Of: Outer membrane
        - Function: facilitate electron transfer
        - Mechanism: force measurements
        - Environment: real time, living cells
        - Context: subnanonewton resolution
        - Strategy: Shewanella oneidensis facilitates electron transfer by force measurements with subnanonewton resolution in real time with living cells.
      + Baseline + Contexts (4/6):
        - Organism: Shewanella oneidensis
        - Part Of: Outer membrane
        - Function: facilitate electron transfer
        - Mechanism: force measurements
        - Context: real time with living cells under aerobic and anaerobic solutions
        - Strategy: Shewanella oneidensis facilitates electron transfer by force measurements with living cells under aerobic and anaerobic solutions.
      + Baseline + Mechanisms (4/6):
        - Organism: Shewanella oneidensis
        - Part Of: Outer membrane
        - Function: facilitate electron transfer
        - Mechanisms: force measurements
        - Context: real time with living cells under aerobic and anaerobic solutions
        - Strategy: Shewanella oneidensis facilitates electron transfer by force measurements with living cells under aerobic and anaerobic solutions.
      + 4-way tie because all the prompts get the same parts wrong, while not improving on the other generated outputs.
14. W1994029841
    * Sample: "title": "Overcoming the brittleness of glass through bio-inspiration and micro-architecture", "abstract": "highly mineralized natural materials such as teeth or mollusk shells boast unusual combinations of stiffness, strength and toughness currently unmatched by engineering materials. while high mineral contents provide stiffness and hardness, these materials also contain weaker interfaces with intricate architectures, which can channel propagating cracks into toughening configurations. here we report the implementation of these features into glass, using a laser engraving technique. three-dimensional arrays of laser-generated microcracks can deflect and guide larger incoming cracks, following the concept of 'stamp holes'. jigsaw-like interfaces, infiltrated with polyurethane, furthermore channel cracks into interlocking configurations and pullout mechanisms, significantly enhancing energy dissipation and toughness. compared with standard glass, which has no microstructure and is brittle, our bio-inspired glass displays built-in mechanisms that make it more deformable and 200 times tougher. this bio-inspired approach, based on carefully architectured interfaces, provides a new pathway to toughening glasses, ceramics or other hard and brittle materials."
      + Baseline (6/6):
        - Organism: glass
        - Part Of: microstructure
        - Function: make glass more deformable and tougher
        - Mechanism: three-dimensional arrays of laser-generated microcracks
        - Context: brittle materials
        - Strategy: make glass more deformable and tougher by creating three-dimensional arrays of laser-generated microcracks
      + Baseline + Environment (4/4):
        - Organism:
        - Part Of:
        - Function: make glass more deformable and tougher
        - Mechanism: three-dimensional arrays of laser-generated microcracks
        - Environment:
        - Context: laser engraving technique
        - Strategy: make glass more deformable and tougher by creating three-dimensional arrays of laser-generated microcracks
      + Baseline + Contexts(⅚):
        - Organism: glass
        - Part Of: microstructure
        - Function: make glass more deformable and tougher
        - Mechanism: three-dimensional arrays of laser-generated microcracks
        - Context: laser engraving
        - Strategy: make glass more deformable and tougher by creating three-dimensional arrays of laser-generated microcracks
      + Baseline + Mechanisms (6/6):
        - Organism: glass
        - Part Of: microstructure
        - Function: make glass more deformable and tougher
        - Mechanisms: three-dimensional arrays of laser-generated microcracks, **jigsaw-like interfaces**
        - Context: brittle materials
        - Strategy: make glass more deformable and tougher by creating three-dimensional arrays of laser-generated microcracks and jigsaw-like interfaces
      + The best prompt is the Baseline + Mechanisms prompt. This is because the output is the most specific because it extracts multiple mechanisms.
15. W2051302904
    * Sample: "title": "Extreme impact and cavitation forces of a biological hammer: strike forces of the peacock mantis shrimp Odontodactylus scyllarus.", "abstract": "summary - mantis shrimp are renowned for their unusual method of breaking shells with\nbrief, powerful strikes of their raptorial appendages. due to the extreme\nspeeds of these strikes underwater, cavitation occurs between their appendages\nand hard-shelled prey. here we examine the magnitude and relative contribution\nof the impact and cavitation forces generated by the peacock mantis shrimp\n odontodactylus scyllarus . we present the surprising finding that each\nstrike generates two brief, high-amplitude force peaks, typically\n390\u2013480 \u03bcs apart. based on high-speed imaging, force measurements and\nacoustic analyses, it is evident that the first force peak is caused by the\nlimb9s impact and the second force peak is due to the collapse of cavitation\nbubbles. peak limb impact forces range from 400 to 1501 n and peak cavitation\nforces reach 504 n. despite their small size, can\ngenerate impact forces thousands of times their body weight. furthermore, on\naverage, cavitation peak forces are 50% of the limb9s impact force, although\ncavitation forces may exceed the limb impact forces by up to 280%. the rapid\nsuccession of high peak forces used by mantis shrimp suggests that mantis\nshrimp use a potent combination of cavitation forces and extraordinarily high\nimpact forces to fracture shells. the stomatopod9s hammer is fundamentally\ndifferent from typical shell-crushing mechanisms such as fish jaws and lobster\nclaws, and may have played an important and as yet unexamined role in the\nevolution of shell form."
      + Baseline (6/6):
        - Organism: peacock mantis shrimp
        - Part Of: raptorial appendages
        - Function: break shells
        - Mechanism: striking with raptorial appendages
        - Context: underwater
        - Strategy: The peacock mantis shrimp breaks shells by striking with raptorial appendages underwater, which generates two brief, high-amplitude force peaks.
      + Baseline + Environment (5/7):
        - Organism: peacock mantis shrimp
        - Part Of: appendages
        - Function: break shells
        - Mechanism: striking with raptorial appendages
        - Environment: with hard-shelled prey
        - Context: underwater
        - Strategy: The peacock mantis shrimp breaks shells by striking with raptorial appendages underwater with hard-shelled prey
      + Baseline + Contexts (6/6):
        - Organism: peacock mantis shrimp
        - Part Of: raptorial appendages
        - Function: break shells
        - Mechanism: striking with raptorial appendages
        - Context: underwater
        - Strategy: The peacock mantis shrimp breaks shells by striking with raptorial appendages underwater
      + Baseline + Mechanisms (6/6):
        - Organism: peacock mantis shrimp
        - Part Of: raptorial appendages
        - Function: break shells
        - Mechanisms: striking with raptorial appendages
        - Context: underwater
        - Strategy: The peacock mantis shrimp breaks shells by striking with raptorial appendages underwater, which generates cavitation bubbles that collapse and create a second force peak.
      + The Baseline and Baseline + Mechanisms prompts are the best prompts; they both have strong strategies. This is a tie.

Set 2

1. W2051930982
   * Sample:"title": "Deep-Sea, Swimming Worms with Luminescent \u201cBombs\u201d", "abstract": "by using remotely operated vehicles, we found seven previously unknown species of swimming annelid worms below 1800 meters. specimens were large and bore a variety of elaborate head appendages. in addition, five species have pairs of ellipsoidal organs homologous to branchiae that produce brilliant green bioluminescence when autotomized. five genes were used to determine the evolutionary relationships of these worms within cirratuliformia. these species form a clade within acrocirridae and were not closely related to either of the two known pelagic cirratuliforms. thus, this clade represents a third invasion of the pelagic realm from cirratuliformia. this finding emphasizes the wealth of discoveries to be made in pelagic and deep demersal habitats."
     + Baseline (6/6):
       - Organism: annelid worms
       - Part Of: head appendages
       - Function: to produce bioluminescence
       - Mechanism: autotomizing
       - Context: deep sea
       - Strategy: Annelid worms produce bioluminescence when autotomizing in deep sea habitats.
     + Baseline + Environment (6/7):
       - Organism: Swimming annelid worms
       - Part Of: Head
       - Function: to produce bioluminescence
       - Mechanism: autotomized
       - Context: deep sea
       - Environment: below 1800 meters
       - Strategy: Swimming annelid worms produce bioluminescence when autotomized in order to attract mates or prey in deep sea environments.
     + Baseline + Contexts (6/6):
       - Organism: Swimming annelid worms
       - Part Of: Head
       - Function: to produce bioluminescence
       - Mechanism: autotomized
       - Context(s): deep sea
       - Strategy: Swimming annelid worms produce bioluminescence when autotomized in deep sea.
     + Baseline + Mechanisms (6/6):
       - Organism: Swimming annelid worms
       - Part Of: Head
       - Function: to produce bioluminescence
       - Mechanism: autotomized
       - Context: deep sea
       - Strategy: Swimming annelid worms produce bioluminescence when autotomized in deep sea.
     + The Baseline + Environment prompt is incorrect because the abstract does not mention what the worm is trying to do when it autotomizes, GPT-3 assumes that is attracts mates or prey when generating the strategy, but this may not be the case.
     + It is a 3-way tie between the other prompts
2. W2014538550
   * Sample: "title": "Elastic modulus of hard tissues", "abstract": "this work aims at evaluating the elastic modulus of hard biological tissues by considering their staggered platelet micro-structure. an analytical expression for the effective modulus along the stagger direction is formulated using three non-dimensional structural variables. structures with a single staggered hierarchy (e.g. collagen fibril) are first studied and predictions are compared with the experimental results and finite element simulations from the literature. a more complicated configuration, such as an array of fibrils, is analyzed next. finally, a mechanical model is proposed for tooth dentin, in which variations in the multi-scale structural hierarchy are shown to significantly affect the macroscopic mechanical properties."
     + Baseline (6/6):
       - Organism: Hard tissues
       - Part Of: Elastic modulus
       - Function: To evaluate the elastic modulus of hard tissues
       - Mechanism: An analytical expression for the effective modulus along the stagger direction is formulated
       - Context: Structures with a single staggered hierarchy
       - Strategy: The elastic modulus of hard tissues is evaluated by considering their staggered platelet micro-structure and formulating an analytical expression for the effective modulus along the stagger direction.
     + Baseline + Environment (4/4):
       - Organism:
       - Part Of:
       - Function: To evaluate the elastic modulus of hard tissues
       - Mechanism: Formulating an analytical expression
       - Context: Structures with a single staggered hierarchy
       - Enviorment:
       - Strategy: The elastic modulus of hard tissues is evaluated by considering their staggered platelet micro-structure and formulating an analytical expression for the effective modulus along the stagger direction.
     + Baseline + Contexts (5/6):
       - Organism: Hard tissues
       - Part Of: Elastic modulus
       - Function: To evaluate the elastic modulus of hard tissues
       - Mechanism: by considering their staggered platelet micro-structure
       - Context(s): an analytical expression for the effective modulus along the stagger direction
       - Strategy: Hard tissues evaluate their elastic modulus by considering their staggered platelet micro-structure
     + Baseline + Mechanisms (6/6):
       - Organism: Hard tissues
       - Part Of: Elastic modulus
       - Function: To evaluate the elastic modulus of hard tissues
       - Mechanism: Formulating an analytical expression
       - Context: Staggered platelet micro-structure
       - Strategy: Hard tissues evaluate their elastic modulus by formulating an analytical expression for the effective modulus along the stagger direction.
     + Some samples are tricky in that there is no “real organism”.
     + GPT-3 treats “hard tissues” as an organism depending on the prompt.
     + The best prompt is the Baseline because it generates all required outputs, and the strategy is the most specific.
3. W2120181153
   * Sample: "title": "Do epidermal lens cells facilitate the absorptance of diffuse light", "abstract": "many understory plants rely on diffuse light for photosynthesis because direct light is usually scattered by upper canopy layers before it strikes the forest floor. there is a considerable gap in the literature concerning the interaction of direct and diffuse light with leaves. some understory plants have well-developed lens-shaped epidermal cells, which have long been thought to increase the absorption of diffuse light. to assess the role of epidermal cell shape in capturing direct vs. diffuse light, we measured leaf reflectance and transmittance with an integrating sphere system using leaves with flat (begonia erythrophylla, citrus reticulata, and ficus benjamina) and lens-shaped epidermal cells (b. bowerae, colocasia esculenta, and impatiens velvetea). in all species examined, more light was absorbed when leaves were irradiated with direct as opposed to diffuse light. when leaves were irradiated with diffuse light, more light was transmitted and more was reflected in both leaf types, resulting in absorptance values 2-3% lower than in leaves irradiated with direct light. these data suggest that lens-shaped epidermal cells do not aid the capture of diffuse light. palisade and mesophyll cell anatomy and leaf thickness appear to have more influence in the capture and absorption of light than does epidermal cell shape."
     + Baseline (6/6):
       - Organism: understory plants with flat or lens-shaped epidermal cells
       - Part Of: leaves
       - Function: increase the absorption of diffuse light
       - Mechanism: lens-shaped epidermal cells
       - Context: understory plants
       - Strategy: Understory plants increase the absorption of diffuse light by having lens-shaped epidermal cells on their leaves.
     + Baseline + Environment (7/7):
       - Organism: understory plants
       - Part Of: leaves
       - Function: increase the absorption of diffuse light
       - Mechanism: lens-shaped epidermal cells
       - Context: understory plants
       - Environment: forest floor
       - Strategy: Understory plants increase the absorption of diffuse light by having lens-shaped epidermal cells on their leaves.
     + Baseline + Contexts (6/6):
       - Organism: understory plants with lens-shaped epidermal cells
       - Part Of: leaves
       - Function: increase the absorption of diffuse light
       - Mechanism: lens-shaped epidermal cells
       - Context(s): understory plants
       - Strategy: Understory plants increase the absorption of diffuse light by having lens-shaped epidermal cells on their leaves.
     + Baseline + Mechanisms (6/6):
       - Organism: understory plants
       - Part Of: leaves
       - Function: increase the absorption of diffuse light
       - Mechanism: lens-shaped epidermal cells
       - Context: understory plants
       - Strategy: Understory plants increase the absorption of diffuse light by having lens-shaped epidermal cells.
     + There is no clear winner here, all the outputs are very similar. So, it is a 4-way tie.
4. W1964124081
   * Sample: "title": "Long-distance transport of gases in plants: a perspective on internal aeration and radial oxygen loss from roots", "abstract": "internal transport of gases is crucial for vascular plants inhabiting aquatic, wetland or flood-prone environments. diffusivity of gases in water is approximately 10\u00a0000 times slower than in air; thus direct exchange of gases between submerged tissues and the environment is strongly impeded. aerenchyma provides a low-resistance internal pathway for gas transport between shoot and root extremities. by this pathway, o2 is supplied to the roots and rhizosphere, while co2, ethylene, and methane move from the soil to the shoots and atmosphere. diffusion is the mechanism by which gases move within roots of all plant species, but significant pressurized through-flow occurs in stems and rhizomes of several emergent and floating-leaved wetland plants. through-flows can raise o2 concentrations in the rhizomes close to ambient levels. in general, rates of flow are determined by plant characteristics such as capacity to generate positive pressures in shoot tissues, and resistance to flow in the aerenchyma, as well as environmental conditions affecting leaf-to-air gradients in humidity and temperature. o2 diffusion in roots is influenced by anatomical, morphological and physiological characteristics, and environmental conditions. roots of many (but not all) wetland species contain large volumes of aerenchyma (e.g. root porosity can reach 55%), while a barrier impermeable to radial o2 loss (rol) often occurs in basal zones. these traits act synergistically to enhance the amount of o2 diffusing to the root apex and enable the development of an aerobic rhizosphere around the root tip, which enhances root penetration into anaerobic substrates. the barrier to rol in roots of some species is induced by growth in stagnant conditions, whereas it is constitutive in others. an inducible change in the resistance to o2 across the hypodermis/exodermis is hypothesized to be of adaptive significance to plants inhabiting transiently waterlogged soils. knowledge on the anatomical basis of the barrier to rol in various species is scant. nevertheless, it has been suggested that the barrier may also impede influx of: (i) soil-derived gases, such as co2, methane, and ethylene; (ii) potentially toxic substances (e.g. reduced metal ions) often present in waterlogged soils; and (iii) nutrients and water. lateral roots, that remain permeable to o2, may be the main surface for exchange of substances between the roots and rhizosphere in wetland species. further work is required to determine whether diversity in structure and function in roots of wetland species can be related to various niche habitats."
     + Baseline (6/6):
       - Organism: vascular plants
       - Part Of: roots
       - Function: internal transport of gases
       - Mechanism: diffusion and through-flow
       - Context: submerged tissues and the environment
       - Strategy: Vascular plants transport gases internally by diffusion and through-flow between submerged tissues and the environment.
     + Baseline + Environment (7/7):
       - Organism: plants
       - Part Of: roots
       - Function: internal transport of gases
       - Mechanism: diffusion and/or through-flow
       - Context: in vascular plants inhabiting aquatic, wetland or flood-prone environments
       - Environment: submerged tissues and the environment
       - Strategy: plants use diffusion and/or through-flow to transport gases between shoot and root extremities in order to supply O2 to the roots and rhizosphere, while CO2, ethylene, and methane move from the soil to the shoots and atmosphere.
     + Baseline + Contexts (6/6):
       - Organism: vascular plants
       - Part Of: roots
       - Function: internal transport of gases
       - Mechanism: diffusion and/or through-flow
       - Context: submerged tissues and the environment
       - Strategy: internal transport of gases in plants is crucial for vascular plants inhabiting aquatic, wetland or flood-prone environments. diffusivity of gases in water is approximately 10 000 times slower than in air; thus direct exchange of gases between submerged tissues and the environment is strongly impeded. aerenchyma provides a low-resistance internal pathway for gas transport between shoot and root extremities. by this pathway, o2 is supplied to the roots and rhizosphere, while co2, ethylene, and methane move from the soil to the shoots and atmosphere.
     + Baseline + Mechanisms (6/6):
       - Organism: vascular plants
       - Part Of: roots, stem, and rhizomes
       - Function: internal transport of gases
       - Mechanism: diffusion and through-flow
       - Context: in aquatic, wetland or flood-prone environments
       - Strategy: Vascular plants transport gases internally by diffusion and through-flow in roots, stem, and rhizomes to supply O2 to the roots and rhizosphere and to move CO2, ethylene, and methane from the soil to the shoots and atmosphere.
     + The best prompt is the Baseline prompt because the other strategies produced are just too long.
5. W2142255159
   * Sample: "title": "To bend a coralline: effect of joint morphology on flexibility and stress amplification in an articulated calcified seaweed", "abstract": "previous studies have demonstrated that fleshy seaweeds resist wave-induced drag forces in part by being flexible. flexibility allows fronds to `go with the flow', reconfiguring into streamlined shapes and reducing frond area projected into flow. this paradigm extends even to articulated coralline algae, which produce calcified fronds that are flexible only because they have distinct joints (genicula). the evolution of flexibility through genicula was a major event that allowed articulated coralline algae to grow elaborate erect fronds in wave-exposed habitats. here we describe the mechanics of genicula in the articulated coralline calliarthron and demonstrate how segmentation affects bending performance and amplifies bending stresses within genicula. a numerical model successfully predicted deflections of articulated fronds by assuming genicula to be assemblages of cables connecting adjacent calcified segments (intergenicula). by varying the dimensions of genicula in the model, we predicted the optimal genicular morphology that maximizes flexibility while minimizing stress amplification. morphological dimensions of genicula most prone to bending stresses (i.e. genicula near the base of fronds) match model predictions."
     + Baseline (6/6):
       - Organism: articulated coralline algae
       - Part Of: fronds
       - Function: to be flexible
       - Mechanism: producing calcified fronds with distinct joints
       - Context: wave-exposed habitats
       - Strategy: Articulated coralline algae produce calcified fronds with distinct joints to be flexible in wave-exposed habitats.
     + Baseline + Environment (7/7):
       - Organism: coralline algae
       - Part Of: genicula
       - Function: to be flexible
       - Mechanism: producing calcified fronds
       - Context: wave-exposed habitats
       - Environment: in water
       - Strategy: Coralline algae produce calcified fronds that are flexible because they have distinct joints (genicula). This allows them to grow elaborate erect fronds in wave-exposed habitats.
     + Baseline + Contexts (6/6):
       - Organism: coralline algae
       - Part Of: genicula
       - Function: to be flexible
       - Mechanism: having distinct joints
       - Context(s): producing calcified fronds
       - Strategy: Coralline algae are flexible because they have distinct joints (genicula).
     + Baseline + Mechanisms (6/6):
       - Organism: articulated coralline algae
       - Part Of: genicula
       - Function: to be flexible
       - Mechanism: producing calcified fronds with distinct joints
       - Context: wave-exposed habitats
       - Strategy: Articulated coralline algae produce calcified fronds with distinct joints to be flexible in wave-exposed habitats.
     + I believe the strategy in the Baseline + Environment prompt is redundant in that the output mentions fronds too often.
     + Thus, the best prompt is between the Baseline and Baseline + Mechanisms.
6. W1965702477
   * Sample: “title": "Plant biomechanics: High-endurance algae", "abstract": "breaking waves place repeated loading on marine algae, which can lead to death by fatigue. but observations of one alga suggest that its joint structure, which lacks transverse connections, confers fatigue resistance."
     + Baseline (6/6):
       - Organism: marine algae
       - Part Of: joint
       - Function: fatigue resistance
       - Mechanism: joint structure
       - Context: breaking waves
       - Strategy: Marine algae resist fatigue by having a joint structure that lacks transverse connections.
     + Baseline + Environment (7/7):
       - Organism: algae
       - Part Of: joint
       - Function: fatigue resistance
       - Mechanism: joint structure
       - Context: breaking waves
       - Environment: Marine
       - Strategy: Algae achieve fatigue resistance by having a joint structure that lacks transverse connections.
     + Baseline + Contexts (6/6):
       - Organism: marine algae
       - Part Of: joint
       - Function: fatigue resistance
       - Mechanism: joint structure
       - Context(s): breaking waves
       - Strategy: Marine Algae achieve fatigue resistance by having a joint structure that lacks transverse connections.
     + Baseline + Mechanisms (6/6):
       - Organism: marine algae
       - Part Of: joint
       - Function: fatigue resistance
       - Mechanism: joint structure
       - Context: breaking waves
       - Strategy: Marine algae resist fatigue by having a joint structure that lacks transverse connections.
     + 4-way tie.
7. W2096652179
   * Sample: "title": "Electrical and behavioral courtship displays in the mormyrid fish Brienomyrus brachyistius.", "abstract": "mormyrid electric fish rely on the waveform of their electric organ discharges (eods) for communicating species, sex, and social status, while they use the sequences of pulse intervals (spis) for communicating rapidly changing behavioral states and motivation. little is known of electric signaling during courtship behavior because of two major difficulties: (1) the fish are not easily bred in captivity and (2) there is no reliable means of separating electric signals from several individuals in natural communication settings. through simulating artificial rain conditions, we have successfully induced courtship and succeeded in breeding a mormyrid electric fish ( brienomyrus brachyistius ) in the laboratory. we have also developed a system of video recording and editing combined with cross correlation analysis to precisely record and view behavior and separate eods from two individuals in non-breeding and breeding contexts. knowing the electrical and motor patterns during courtship allows for further exploration of topics such as mate choice and neural basis of pattern generation in these fish.\n\nhere we describe nine common motor displays and 11 spis. analysis of frequency of occurrences suggests that some spi patterns are sex and season specific. we also observed electrical duetting called \\`rasp matching' during courtship signaling among pairs; males and females exchange \\`rasps' and `bursts', respectively, in alternation. our study employs new techniques to separate and document spis in the context of courtship. we show that some spis correlate with specific behavioral acts around the time of spawning."
     + Baseline (6/6):
       - Organism: mormyrid fish
       - Part Of: electric organ
       - Function: communicating species, sex, and social status
       - Mechanism: electric organ discharges
       - Context: natural communication settings
       - Strategy: mormyrid fish communicate species, sex, and social status by electric organ discharges in natural communication setting
     + Baseline + Environment (7/7):
       - Organism: mormyrid electric fish
       - Part Of: electric signaling during courtship behavior
       - Function: communicating species, sex, and social status
       - Mechanism: electric organ discharges
       - Context: while they use the sequences of pulse intervals for communicating rapidly changing behavioral states and motivation
       - Environment: natural communication settings
       - Strategy: mormyrid electric fish communicate species, sex, and social status by electric organ discharges and sequences of pulse intervals during courtship behavior in natural communication settings.
     + Baseline + Contexts (6/6):
       - Organism: mormyrid electric fish
       - Part Of: electric organ
       - Function: communicating species, sex, and social status
       - Mechanism: electric organ discharges
       - Context(s): natural communication settings
       - Strategy: mormyrid electric fish communicate species, sex, and social status by electric organ discharges in natural communication settings.
     + Baseline + Mechanisms (6/6):
       - Organism: Brienomyrus brachyistius
       - Part Of: electric organ
       - Function: communicating species, sex, and social status
       - Mechanism: electric organ discharges
       - Context: artificial rain conditions
       - Strategy: Brienomyrus brachyistius communicate species, sex, and social status by electric organ discharges during artificial rain conditions
     + The Baseline + Environment prompt is a little too specific, in that it mixes information together in a way that is not correct in all settings.
     + But, it is a 3-way tie for the other prompts.
8. W1995451497
   * Sample: "title": "Aerodynamics of saccate pollen and its implications for wind pollination", "abstract": "pollen grains of many wind-pollinated plants contain 1-3 air-filled bladders, or sacci. sacci are thought to help orient the pollen grain in the pollination droplet. sacci also increase surface area of the pollen grain, yet add minimal mass, thereby increasing dispersal distance; however, this aerodynamic hypothesis has not been tested in a published study. using scanning electron and transmission electron microscopy, mathematical modeling, and the saccate pollen of three extant conifers with structurally different pollen grains (pinus, falcatifolium, dacrydium), we developed a computational model to investigate pollen flight. the model calculates terminal settling velocity based on structural characters of the pollen grain, including lengths, widths, and depths of the main body and sacci; angle of saccus rotation; and thicknesses of the saccus wall, endoreticulations, intine, and exine. the settling speeds predicted by the model were empirically validated by stroboscopic photography. this study is the first to quantitatively demonstrate the adaptive significance of sacci for the aerodynamics of wind pollination. modeling pollen both with and without sacci indicated that sacci can reduce pollen settling speeds, thereby increasing dispersal distance, with the exception of pollen grains having robust endoreticulations and those with thick saccus walls. furthermore, because the mathematical model is based on structural characters and error propagation methods show that the model yields valid results when sample sizes are small, the flight dynamics of fossil pollen can be investigated. several fossils were studied, including bisaccate (pinus, pteruchus, caytonanthus), monosaccate (gothania), and nonsaccate (monoletes) pollen types."
     + Baseline (6/6):
       - Organism: conifers
       - Part Of: pollen grain
       - Function: increase dispersal distance
       - Mechanism: air-filled bladders, or sacci
       - Context: pollen grains of many wind-pollinated plants
       - Strategy: Conifers increase dispersal distance by producing pollen grains with air-filled bladders, or sacci.
     + Baseline + Environment (7/7):
       - Organism: Conifers
       - Part Of: pollen grain
       - Function: increase dispersal distance
       - Mechanism: air-filled bladders
       - Context: wind-pollinated plants
       - Environment: in the pollination droplet
       - Strategy: Conifers increase dispersal distance by having air-filled bladders in their pollen grains.
     + Baseline + Contexts (6/6):
       - Organism: many wind-pollinated plants
       - Part Of: pollen grain
       - Function: increase dispersal distance
       - Mechanism: air-filled bladders
       - Context(s): wind pollination
       - Strategy: many wind-pollinated plants increase dispersal distance by pollen grains with air-filled bladders.
     + Baseline + Mechanisms (6/6):
       - Organism: Conifers
       - Part Of: pollen grain
       - Function: increase dispersal distance
       - Mechanism: air-filled bladders, or sacci
       - Context: wind-pollinated plants
       - Strategy: Conifers increase dispersal distance by producing pollen grains with air-filled bladders, or sacci.
     + All the outputs are very similar, 4-way tie.
9. W2003328708
   * Sample: "title": "Characterization of two new multiforms of Trametes pubescens laccase", "abstract": "electrochemical properties of two multiforms of laccase from trametes pubescens basidiomycete (lac1 and lac2) have been studied. the standard redox potentials of the t1 sites of the enzymes were found to be 746 and 738 mv vs. nhe for lac1 and lac2, respectively. bioelectroreduction of oxygen based on direct electron transfer between each of the two forms of trametes pubescens laccase and spectrographic graphite electrodes has been demonstrated and studied. it is concluded that the t1 site of laccase is the first electron acceptor, both in solution (homogeneous case) and when the enzymes are adsorbed on the surface of the graphite electrode (heterogeneous case). thus, the previously proposed mechanism of oxygen bioelectroreduction by adsorbed fungal laccase was additionally confirmed using two forms of the enzyme. moreover, the assumed need for extracellular laccase to communicate directly and electronically with a solid matrix (lignin) in the course of lignin degradation is discussed. in summary, the possible roles of multiforms of the enzyme based on their electrochemical, biochemical, spectral, and kinetic properties have been suggested to consist in broadening of the substrate specificity of the enzyme, in turn yielding the possibility to dynamically regulate the process of lignin degradation according to the real-time survival needs of the organism."
     + Baseline (6/6):
       - Organism: Trametes pubescens laccase
       - Part Of: the t1 site of laccase
       - Function: to dynamically regulate the process of lignin degradation
       - Mechanism: two forms of the enzyme
       - Context: electrochemical, biochemical, spectral, and kinetic properties
       - Strategy: Trametes pubescens laccase dynamically regulates the process of lignin degradation by having two forms of the enzyme that communicate electronically with a solid matrix.
     + Baseline + Environment (7/7):
       - Organism: trametes pubescens laccase
       - Part Of: Laccase
       - Function: to dynamically regulate the process of lignin degradation
       - Mechanism: two forms of the enzyme
       - Context: electrochemical, biochemical, spectral, and kinetic properties
       - Environment: extracellular
       - Strategy: Trametes pubescens laccase dynamically regulates the process of lignin degradation by two forms of the enzyme in electrochemical, biochemical, spectral, and kinetic properties in extracellular environment.
     + Baseline + Contexts (6/6):
       - Organism: Trametes pubescens laccase
       - Part Of: multiforms of the enzyme
       - Function: to dynamically regulate the process of lignin degradation
       - Mechanism: two forms of the enzyme
       - Context(s): electrochemical, biochemical, spectral, and kinetic properties
       - Strategy: Trametes pubescens laccase broadens the substrate specificity of the enzyme to dynamically regulate the process of lignin degradation.
     + Baseline + Mechanisms (6/6):
       - Organism: trametes pubescens basidiomycete
       - Part Of: laccase
       - Function: to dynamically regulate the process of lignin degradation
       - Mechanism: electrochemical properties, bioelectroreduction of oxygen, direct electron transfer
       - Context: solution and when enzymes are adsorbed on graphite electrode
       - Strategy: Trametes pubescens basidiomycete dynamically regulates the process of lignin degradation by using electrochemical properties, bioelectroreduction of oxygen, and direct electron transfer.
     + The Baseline + Mechanisms prompt output has the best strategy out of the 4. The other generated parts of the prompt are similar.
10. W2085502080
    * Sample: "title": "Diel variation in ammonia excretion, glutamine levels, and hydration status in two species of terrestrial isopods.", "abstract": "terrestrial isopods (suborder oniscidea) excrete most nitrogen diurnally as volatile ammonia, and ammonia-loaded animals accumulate nonessential amino acids, which may constitute the major nocturnal nitrogen pool. this study explored the relationship between ammonia excretion, glutamine storage/mobilization, and water balance, in two sympatric species ligidium lapetum (section diplocheta), a hygric species; and armadillidium vulgare (section crinocheta), a xeric species capable of water-vapor absorption (wva). ammonia excretion (12-h), tissue glutamine levels, and water contents were measured following field collection of animals at dusk and dawn. in both species, diurnal ammonia excretion exceeded nocturnal excretion four- to fivefold while glutamine levels increased four- to sevenfold during the night. most glutamine was accumulated in the somatic tissues (\u201cbody wall\u201d). while data support the role of glutamine in nocturnal nitrogen storage, potential nitrogen mobilization from glutamine breakdown (162\u00a0\u03bcmol\u00a0g\u22121 in a. vulgare) exceeds measured ammonia excretion (2.5\u00a0\u03bcmol\u00a0g\u22121) over 60-fold. this may serve to generate the high hemolymph ammonia concentrations $$({\\text{and high}}\\;p\_{{\\text{nh}}\_3 } )$$\n seen during volatilization. the energetic cost of ammonia volatilization is discussed in the light of these findings. mean water contents were similar at dusk and dawn in both species, indicating that diel cycles of water depletion and replenishment were not occurring."
      + Baseline (6/6):
        - rganism: terrestrial isopods
        - Part Of: body
        - Function: excrete nitrogen
        - Mechanism: excreting ammonia
        - Context: diurnal and nocturnal
        - Strategy: terrestrial isopods excrete nitrogen by excreting ammonia during the day and night.
      + Baseline + Environment (7/7):
        - Organism: terrestrial isopods
        - Part Of: body
        - Function: excrete nitrogen
        - Mechanism: excreting ammonia
        - Context: diurnal and nocturnal
        - Environment: terrestrial
        - Strategy: terrestrial isopods excrete nitrogen by excreting ammonia diurnally and nocturnally.
      + Baseline + Contexts (6/6):
        - Organism: terrestrial isopods
        - Part Of: body
        - Function: excrete nitrogen
        - Mechanism: excreting ammonia
        - Context: diurnal and nocturnal
        - Strategy: terrestrial isopods excrete nitrogen by excreting ammonia during diurnal and nocturnal cycles.
      + Baseline + Mechanisms (6/6):
        - Organism: terrestrial isopods
        - Part Of: body
        - Function: excrete nitrogen
        - Mechanism: excreting ammonia
        - Context: field collection of animals at dusk and dawn
        - Strategy: terrestrial isopods excrete nitrogen by excreting ammonia during field collection of animals at dusk and dawn.
      + 4-way tie, very similar prompt outputs.
11. W2102369240
    * Sample: "title": "Biological Activities of Rice Allelochemicals Momilactone A and B", "abstract": "momilactone a and b had been demonstrated to play critical roles in rice allelopathy by the findings of\r\nphysiological and genetical approaches. rice plants secrete momilactones into the rhizosphere over their entire life cycle at phytotoxic levels, and momilactones are able to account for the majority of the observed rice allelopathy. however, allelopathic activities of momilactones were determined on only a few test plant species. therefore, this study was to determine the allelopathic activities of momilactones against nine test plant species including weed species, and four rice cultivars.\r\nmomilactone a and b inhibited arabidopsis, alfalfa, lettuce, cress, timothy, barnyard grass, e. colonum, crabgrass and ryegrass at concentrations greater than 3 and 0.3 \u03bcm, respectively. the inhibition on those test plants was concentration dependent. on the other hand, effectiveness of momilactone a and b on rice cultivars, koshihikari, nipponbare, norin 8 and sasanishiki was very weak. those rice cultivars were only inhibited by momilactone a and b at concentrations greater than 300 and 100 \u03bcm, respectively. momilactone a and b may have potential as templates for the development of new plant control substances because of their selective inhibitory activities on weed plant\r\nspecies. more importantly, momilactone a and b as allelochemicals in rice may provide a molecular marker for\r\nbreeding and/or engineering efforts directed at increasing allelopathic activity of this critical staple food crop."
      + Baseline (6/6):
        - Organism: Rice
        - Part Of: momilactones
        - Function: increase allelopathic activity
        - Mechanism: inhibiting growth of other plants
        - Context: in the rhizosphere
        - Strategy: Rice plants increase allelopathic activity by secreting momilactones into the rhizosphere which inhibits the growth of other plants.
      + Baseline + Environment (7/7):
        - Organism: rice plants
        - Part Of: momilactones
        - Function: increase allelopathic activity
        - Mechanism: secreting momilactones
        - Context: over their entire life cycle
        - Environment: rhizoshpere
        - Strategy: rice plants increase allelopathic activity by secreting momilactones into the rhizosphere over their entire life cycle.
      + Baseline + Contexts (6/6):
        - Organism: rice plants
        - Part Of: momilactones
        - Function: inhibit weed plant species
        - Mechanism: secreting momilactones
        - Context(s): over rice plants’ entire life cycle
        - Strategy: rice plants inhibit weed plant species by secreting momilactones into the rhizosphere over their entire life cycle.
      + Baseline + Mechanisms (6/6):
        - Organism: rice plants
        - Part Of: momilactones
        - Function: increase allelopathic activity
        - Mechanism: secreting momilactones
        - Context: over their entire life cycle
        - Strategy:rice plants increase allelopathic activity by secreting momilactones over their entire life cycle.
      + All the outputs are very similar, but the best strategy is with the Baseline prompt.
12. W107082265
    * Sample: "title": "Seasonal adjustment of solar heat gain independent of coat coloration in a desert mammal.", "abstract": "despite the apparent importance of solar radiation as a source of heat for free-living animals, there exists no substantial body of empirical data describing physiological responses to solar radiation under the range of convective conditions likely to occur in nature. we therefore quantified effects of simulated solar radiation and wind on metabolic heat production in the rock squirrel, spermophilus variegatus. this diurnal mammal inhabits the sonoran desert and seasonally replaces its pelage in a fashion in which it retains constant external appearance but incorporates optical and structural changes that are thought to significantly alter heat-transfer properties of the coat. at a given wind speed, the presence of 950 w m\u207b\u00b2 of simulated solar radiation reduces metabolic heat production by 15% (at a wind speed of 4 m s\u207b\u00b9) to 37% (at a wind speed of 0.25 m s\u207b\u00b9). independent of effects of irradiance, metabolic heat production significantly increases with wind speed such that as wind speed is increased from ..."
      + Baseline (5.5/6):
        - Organism: rock squirrel
        - Part Of: coat
        - Function: reduce metabolic heat production
        - Mechanism: seasonally replacing pelage
        - Context: under the range of convective conditions likely to occur in nature
        - Strategy: The rock squirrel reduces metabolic heat production by seasonally replacing its pelage in a fashion in which it retains constant external appearance but incorporates optical and structural changes that are thought to significantly alter heat-transfer properties of the coat.
      + Baseline + Environment (6.5/7):
        - Organism: rock squirrel
        - Part Of: coat
        - Function: reduce metabolic heat production
        - Mechanism: seasonally replacing pelage
        - Context: at a given wind speed
        - Environment: sonoran desert
        - Strategy: The rock squirrel reduces metabolic heat production by seasonally replacing its pelage in a fashion in which it retains constant external appearance but incorporates optical and structural changes that are thought to significantly alter heat-transfer properties of the coat.
      + Baseline + Contexts (5.5/6):
        - Organism: rock squirrel
        - Part Of: pelage
        - Function: reduce metabolic heat production
        - Mechanism: seasonally replacing pelage
        - Context(s): under the range of convective conditions
        - Strategy: rock squirrels reduce metabolic heat production by seasonally replacing their pelage
      + Baseline + Mechanisms (5.5/6):
        - Organism: rock squirrel
        - Part Of: coat
        - Function: reduce metabolic heat production
        - Mechanism: seasonally replacing pelage
        - Context: under the range of convective conditions likely to occur in nature
        - Strategy: The rock squirrel reduces metabolic heat production by seasonally replacing its pelage in a fashion in which it retains constant external appearance but incorporates optical and structural changes that are thought to significantly alter heat-transfer properties of the coat.
      + The Baseline + Contexts prompt is the best because the strategy produced is clear and concise.
13. W2319697479
    * Sample: "title": "Antipredator Mechanisms of Australian Frogs", "abstract": "we examined the antipredator mechanisms of 19 australian hylid species (two genera) and 23 myobatrachid species (nine genera). frogs of 39 of the 42 species exhibited one or more defensive mech- anisms (other than escape), including postures, bright coloration, adhesive skin secretions, and/or calls. de- fensive posturing occurred in individuals of 38 species, and varied in relationship to morphology and lo- calization of skin glands. bright colors, when present, typically were displayed during defensive postures. we documented dramatic geographic variation in the antipredator display of one species, limnodynastes tasmaniensis. defensive postures were accompanied by secretions from dorsal skin glands. these secretions were sometimes associated with a distinctive odor. adhesive skin secretions were present in burrowing frogs of three genera. defensive calls were emitted by most hylids but none of the myobatrachids. we offer a hypothesis of mimicry to explain the behavior pattern of exposing the bold black and white ventral surface in pseudophryne and crinia species."
      + Baseline (6/6):
        - Organism: Australian frogs
        - Part Of: skin
        - Function: to avoid being eaten by predators
        - Mechanism: postures, bright coloration, adhesive skin secretions, and/or calls
        - Context: when an individual frog feels threatened by a predator
        - Strategy: Australian frogs use postures, bright coloration, adhesive skin secretions, and/or calls to avoid being eaten by predators.
      + Baseline + Environment (7/7):
        - Organism: Australian frogs
        - Part Of: skin
        - Function: to avoid predators
        - Mechanism: postures, bright coloration, adhesive skin secretions, and/or calls
        - Context: when predators are present
        - Environment: varies
        - Strategy: Australian frogs avoid predators by displaying postures, bright coloration, adhesive skin secretions, and/or calls.
      + Baseline + Contexts (6/6):
        - Organism: Australian frogs
        - Part Of: skin
        - Function: to avoid being eaten by predators
        - Mechanism: postures, bright coloration, adhesive skin secretions, and/or calls
        - Context(s): when an Australian frog feels threatened
        - Strategy: When Australian frogs feel threatened, they use postures, bright coloration, adhesive skin secretions, and/or calls to avoid being eaten by predators.
      + Baseline + Mechanisms (6/6):
        - Organism: Australian frogs
        - Part Of: skin
        - Function: to avoid being eaten by predators
        - Mechanism: postures, bright coloration, adhesive skin secretions, and/or calls
        - Context: when a frog is approached by a predator
        - Strategy: Australian frogs use postures, bright coloration, adhesive skin secretions, and/or calls to avoid being eaten by predators.
      + 4-way tie, similar outputs
14. W2133743025
    * Sample: "title": "Microtubule Assembly Dynamics at the Nanoscale", "abstract": "summary the data are consistent with a mechanochemical model in which a spatially extended gtp cap allows substantial shortening on the nanoscale, while still preventing complete catastrophe in most cases."
      + Baseline (4/4):
        - Organism:
        - Part Of:
        - Function: allow substantial shortening on the nanoscale
        - Mechanism: a spatially extended gtp cap
        - Context: on the nanoscale
        - Strategy: The function of the organism is to allow substantial shortening on the nanoscale. The mechanism of the organism is a spatially extended gtp cap. The context of the organism is on the nanoscale.
      + Baseline + Environment (4/4):
        - Organism:
        - Part Of:
        - Function: allow substantial shortening on the nanoscale
        - Mechanism: a spatially extended gtp cap
        - Context: on the nanoscale
        - Environment:
        - Strategy: The function of the organism is to allow substantial shortening on the nanoscale. The mechanism of the organism is a spatially extended gtp cap. The context of the organism is on the nanoscale. There is no mention of the environment, organism, or part of the organism in the text so these cannot be included in the strategy.
      + Baseline + Contexts (4/4):
        - Organism: not stated
        - Part Of: not stated
        - Function: allow substantial shortening on the nanoscale
        - Mechanism: a spatially extended gtp cap
        - Context(s): on the nanoscale
        - Strategy: allow substantial shortening on the nanoscale by using a spatially extended gtp cap
      + Baseline + Mechanisms (3/4):
        - Organism: not stated
        - Part Of: not stated
        - Function: allow substantial shortening on the nanoscale
        - Mechanism: a spatially extended gtp cap
        - Context: on the nanoscale
        - Strategy: not stated
      + This is another sample with no organism. If there is no organism, there is no part of the organism that is able to be found.
      + The best prompt is the Baseline + Contexts prompt because it has the strongest strategy.
15. W2181101998
    * Sample: "title": "Impact behaviour of freeze-dried and fresh pomelo (Citrus maxima) peel: influence of the hydration state", "abstract": "pomelos (citrus maxima) are known for their thick peel which-inter alia-serves as energy dissipator when fruits impact on the ground after being shed. it protects the fruit from splitting open and thus enables the contained seeds to stay germinable and to potentially be dispersed by animal vectors. the main part of the peel consists of a parenchymatous tissue that can be interpreted from a materials point of view as open pored foam whose struts are pressurized and filled with liquid. in order to investigate the influence of the water content on the energy dissipation capacity, drop weight tests were conducted with fresh and with freeze-dried peel samples. based on the coefficient of restitution it was found that freeze-drying markedly reduces the relative energy dissipation capacity of the peel. measuring the transmitted force during impact furthermore indicated a transition from a uniform collapse of the foam-like tissue to a progressive collapse due to water extraction. representing the peel by a maxwell model illustrates that freeze-drying not only drastically reduces the damping function of the dashpots but also stiffens the springs of the model."
      + Baseline (6/6):
        - Organism: pomelo
        - Part Of: peel
        - Function: energy dissipator
        - Mechanism: open pored foam
        - Context: drop weight tests
        - Strategy: pomelo peel serves as an energy dissipator by being an open pored foam that absorbs impact forces
      + Baseline + Environment (7/7):
        - Organism: pomelo
        - Part Of: parenchymatous tissue
        - Function: energy dissipator
        - Mechanism: pomelo peel
        - Context: when fruits impact on the ground
        - Environment: after being shed
        - Strategy: pomelo peel dissipates energy by parenchymatous tissue when fruits impact on the ground after being shed.
      + Baseline + Contexts (6/6):
        - Organism: pomelo
        - Part Of: peel
        - Function: energy dissipator
        - Mechanism: open pored foam
        - Context: drop weight tests
        - Strategy: pomelos dissipate energy by having an open pored foam as part of their peel which absorbs impact forces.
      + Baseline + Mechanisms (5/6):
        - Organism: pomelo
        - Part Of: peel
        - Function: energy dissipator
        - Mechanism: impact
        - Context: drop weight tests
        - Strategy: pomelos dissipate energy by impacting on the ground after being shed.
      + The best prompt is the Baseline + Environment prompt because it has the strongest strategy.

Set 1

* Baseline : 8
* Baseline + Environment: 7
* Baseline + Contexts: 5
* Baseline + Mechanisms: 8

Set 2

* Baseline : 10
* Baseline + Environment: 6
* Baseline + Contexts: 9
* Baseline + Mechanisms: 9

Total

* Baseline : 18
* Baseline + Environment: 13
* Baseline + Contexts: 14
* Baseline + Mechanisms: 17

The Baseline prompt is the best prompt, with the Baseline + Mechanisms prompt coming in second place.