**Introduction**

Comparison of the best prompt involving the baseline with an extra “environment” element on Da Vinci 2 vs Da Vinci 3.

**Content**

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."
     + GPT-3-DV-2 (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.
     + GPT-3-DV-3 (6/7):
       - Organism: Túngara frog
       - Part Of: oviduct glands
       - Function: protection of unattended reproductive stages
       - Mechanisms: cocktail of proteins
       - Environment: land vertebrate → the nests of the túngara frog
       - Context: defence against microbial colonization and insect attack
       - Strategy: Túngara frogs protect unattended reproductive stages by using a cocktail of proteins from oviduct glands to defend against microbial colonization and insect attack.
     + Da Vinci 2 has more correct outputs, but Da Vinci 3 has higher quality outputs. Thus, I will go with Da Vinci 3 in this case.
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."
     + GPT-3-DV-2 (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.
     + GPT-3-DV-3 (7/7):
       - Organism: Solifugae
       - Part Of: Palpal organ
       - Function: prey capture
       - Mechanism: Suctorial Organ
       - Environment: Wild
       - Context: smooth, vertical surfaces
       - Strategy: Solifugae capture prey on smooth, vertical surfaces in the wild by using a suctorial organ located in the palpal organ.
     + Da Vinci 2 is better because it describes the mechanism as suction, rather than just the organ.
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."
     + GPT-3-DV-2 (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.
     + GPT-3-DV-3 (7/7):
       - Organism: Macrotermes michaelseni
       - Part Of: Mound
       - Function: Homeostasis of the mound atmosphere
       - Mechanism: Ventilation by a tidal movement of air
       - Environment: Mound
       - Context: Temporal variation in wind speed and wind direction
       - Strategy: Macrotermes michaelseni maintain homeostasis of the mound atmosphere by ventilating it with a tidal movement of air driven by temporal variation in wind speed and wind direction.
     + Da Vinci 3 is slightly more specific with regard to the mechanism
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."
     + GPT-3-DV-2 (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.
     + GPT-3-DV-3 (5/7):
       - Organism: Ancylostoma caninum
       - Part Of: intestine
       - Function: digest hemoglobin
       - Mechanism: multi-enzyme cascade of proteolysis
       - Environment: canine hookworm
       - Context: intestinal brush border membrane
       - Strategy: Ancylostoma caninum digests hemoglobin by a multi-enzyme cascade of proteolysis in the intestine of the canine hookworm
     + Da Vinci 2 is better
       - In both cases, environment and context should be switched, but if this were indeed the case, the context of the Da Vinci 2 output is better.
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."
     + GPT-3-DV-2 (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
     + GPT-3-DV-3 (5/7):
       - Organism: Anemones, wormlike invertebrates, echinoderms, mammals, turtles, burrowing bivalves, snails, spiders, cephalopods, mammals, and elephants
       - Part Of: Arms, tentacles, tongue, trunk, feet, and legs
       - Function: support, movement, muscular antagonism, and the amplification of the force and displacement of muscle contraction
       - Mechanism: internal pressure
       - Environment: various
       - Context: contraction of muscle and the resulting decrease in one of the dimensions
       - Strategy: Anemones and other organisms rely on a hydrostatic skeleton 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, a wide array of deformations, movements and changes can be created.
     + Da Vinci 3 is better

Conclusion

* DV-2: 2
* DV-3: 3