ETIOLOGY = a statement about an incomplete underlying cause or mechanism. The next actionable step is to complete and discover the missing underlying cause or explanation.

1. **(BY)WHICH… (AND/OR)**
2. “more research needs to focus on <the mechanism by which postn responds to mechanical forces>, how it initiates these reactions, and how it relates to oa.” [need to determine the underlying mechanism of postn’s response to mechanical forces]
3. “cells (0.5×106hek293) were plated in 6-well plate 24 hr before transfection, by which time they reached 50–70% confluency.” [a description of the methodology where at a specific time point, they reached 50-70% confluency, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
4. **AETIOLOGY/ ETIOLOGIC MECHANISM/ ETIOLOGICAL/ ETIOLOGICALLY/ ETIOLOGIES/ EIOTLOGY**
5. “genetic factors also contribute to risk of many common traits and diseases like <endometriosis and uterine fibroids that have a more complex aetiology involving both genetic and environmental factors>.” [need to determine the underlying mechanism of endometriosis and uterine fibroids that includes genetic and environmental factors]
6. “<the aetiology of tori is not clear at all> [1] even if genetics is supposed to be the most widely accepted factor [2,3].” [the cause is unknown/incomplete and seems to include genetics]
7. “the objectives of this project were to confirm the outbreak and <to identify the aetiology, source> and mode of transmission.” [need to determine the cause of the outbreak]
8. “aetiology of acute viral hepatitis (avh) cannot be differentiated on the basis of mode of presentation; confirmation is done serologically.” [a methodology to determine the cause of avh (serologically), not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
9. “several topics were included, such as aetiology, diagnosis and treatment of diseases related to obesity, including diabetes mellitus in cats and the metabolic syndrome in horses, reproductive disorders, and the link between obesity and inflammation.” [the aetiology is an included topic in the discussion, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
10. “in most of the cases, the underlying aetiology is gallstone.” [the aetiology is known (gallstone) and not incomplete, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
11. “detection of different level of risk within the population and <greater understanding of the etiologic mechanisms may allow for the development of new prevention strategies>; thus present findings suggest that neurotoxic effects of p,p ′ - ddt might be mediated through oxidative stress.” [need to determine the underlying mechanistic cause of neurotoxic effects of p.p’]
12. “<an imbalance in excitation and inhibition is posited to be central to the etiologic mechanisms of fragile x>.” [need to determine the underlying causal mechanism of fragile x that may include an imbalance in excitation and inhibition]
13. “whether <the etiological factors contributing to lung cancer differ between women and men has yet to be resolved>; however, some distinctions appear to exist.” [need to determine the underlying causal factors contributing to lung cancer differences between women and men]
14. “we investigated the association between obesity and asthma in pre-pubertal school-aged children, undertaking separate analyses in boys and girls, with a view <to understanding the possible aetiological roles of physiological (i.e., respiratory obstruction) and immunological (i.e., allergic sensitisation) mechanisms>.” [need to determine the underlying causal roles of physiological and immunological mechanisms]
15. “trypanosoma cruzi , the etiological agent of chagas disease, infects approximately 8 million people in latin america[1].” [a statement of the underlying cause (trypanosoma cruzi) of Chagas disease, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
16. “unfortunately, 30 years after the discovery of hiv as the etiological agent of aids1,2there are still millions of individuals not receiving cart and in whom the natural history of hiv disease repeats itself monotonously.” [a statement of the underlying cause (hiv) of aids, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
17. “it is currently unknown whether <the recently identified tgct risk loci are also etiologically associated with standard clinical tgct risk factors, such as cryptorchidism>.” [need to determine the underlying cause of tgct risk loci and standard clinical tgct risk factors]
18. “<etiologically, it has been proposed that the invagination of the epidermis may result from an abnormal clone of epidermal cells which leads to the formation of cornoid lamella> [7].” [a proposed possible causal understanding of the invagination of the epidermis]
19. “this is a curious reading of the dsm , given the latter’s insistence on its own nature as providing a medical nomenclature, and as aetiologically neutral (american psychiatric association, 1994: xvii–xviii).” [a statement that the dsm is cause neutral, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
20. “fifty-five patients with etiologically different liver disease and nine patients who were not treated with tacrolimus-based immunosuppressive regimens were excluded from the study.” [a statement of inclusion criteria of a study where patients with etiologically different liver disease were excluded, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
21. “although <several etiologies and risk factors have been suspected as causes of post-ci vertigo>, impaired vestibular function is not always associated with vertigo symptoms; furthermore, the role of central compensatory mechanisms in post-ci vertigo symptoms remains to be elucidated.” [need to determine the underlying causes of post-ci vertigo]
22. “the fraught status of <the psychogenic aetiologies associated with a psychiatry> that has been left behind is also evident in responses to a british medical journal article in 2003 written by ray moynihan that described the ‘making of’ fsd by researchers with close ties to drug companies (moynihan, 2003: 45).” [need to determine the underlying causes associated with a psychiatry]
23. “however, in the setting of positive serum rpr and csf leukocytosis and titers positive for vdrl confirmed the diagnosis of syphilitic uveitis, and other infectious and rheumatologic etiologies were concurrently excluded.” [a statement about diagnosing a patient where rheumatologic causes were excluded, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
24. “differentials included infectious etiologies such as toxoplasmosis, feline infectious peritonitis and cryptococcosis.” [a statement defining differentials that included infectious etiologies, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
25. “<sarcoidosis is a multi-system granulomatous disease of unknown etiology>.” [need to determine the underlying cause of sarcoidosis]
26. “but on the contrary, <there is high incidence of malnutrition as compared to patients who are not diabetic, probably due to the multifactorial etiology>.” [need to determine the multifactorial underlying cause of malnutrition]
27. “however, when housed in a pathogen-free environment, these animals do not have overt signs of systemic infection and they do not die early from an infectious etiology.” [a statement that animals are not dying from an infectious cause, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
28. “etiology: the etiologies were determined by personal interview with 103 of the 150 patients who were compos mentis during their hospital stay.” [a methodological statement to determine the etiology using personal interview, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
29. “EXAMPLE” [EXAMPLE]
30. **CAUSAL/ CAUSALITY/ CAUSITIVE/ CAUSITIVE MECHANISMS/ CAUSE/ CAUSED/ CAUSES/ CAUSING/ MAIN CAUSES**
31. “it’s reported that <the lead snps associated are not necessarily the causal ones>, since there are often snps strongly correlated to gws snps due to high ld.” [need to determine the underlying causal snps to go beyond the association]
32. “first, it was nearly impossible to determine <the causal relationship between gastroduodenal symptoms and pud>.” [need to determine the underlying cause of gastroduodenal symptoms and pud]
33. “the biomedical research community is embracing multi-modal data because it contains distinct biological information that can be used to answer causal and systems biology questions678.” [a statement about a new data type (multi-modal data) that is being used to help answer causal and systems biology questions, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
34. “thus, we applied four analytic strategies to this study using recent advancements in the causal inference literature for mediation analysis, using the counterfactual framework.” [a methodological statement that used the ‘causal inference literature’, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
35. “second, the cross-sectional study design cannot establish <the causality between associated factors and recent hiv infection>.” [need to determine the underlying mechanistic cause between associated factors and recent hiv infection]
36. “future studies should evaluate <altered methylation and expression at these sites, including mir21 , both in whole blood and specific cell types, before initiation of disease and in association with environmental factors to better understand causality>.” [need to determine the underlying mechanistic cause of altered methylation and expression at these sites, including mir21 , both in whole blood and specific cell types, before initiation of disease and in association with environmental factors]
37. “although this study cannot establish <causality>, it supports the hypothesis <that improved self-reported physical health is a mechanism by which the symptoms of anxiety and depression are decreased in patients undergoing obesity surgery>.” [need to determine the underlying mechanistic cause of improved self-reported physical health in patients undergoing obesity surgery]
38. “<the causality and relationship between aes/saes and the study drug> will also be analyzed and evaluated on the basis of standard operation procedures (sops) of the cfda, which define causality and relationship as clearly related, probable, possible, doubtful, and clearly not.” [need to determine the underlying cause of the interaction between aes/saes and the study drug], [a statement about the definition of causality, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
39. “it should be stressed that the causality can only be assessed by hypothesizing about and testing the underlying biological mechanisms.” [a methodological statement about how to determine causality in general, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
40. “to date, even combining results from many variants has provided limited value because <only a proportion of causative loci have been identified and there are substantial environmental effects that contribute to most common diseases>.” [need to determine the underlying cause of most common diseases, including loci and/or environmental effects]
41. “we tested the hypothesis that <the muscle ubiquitin proteasome system plays a causative role in pressure-induced deep tissue injury>.” [need to determine the underlying cause of pressure-induced deep tissue injury, including the muscle ubiquitin proteasome system]
42. “the causative agents of malaria are parasitic protozoa belonging to the genus plasmodium .” [the underlying cause is known (parasitic protozoa) of malaria, not a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
43. “the md group had more negative identification of causative organisms than the cd group (p=0.02).” [a statement about the differential in identifying ‘causative organisms’ between groups, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
44. “over recent decades, a number of experimental and clinical studies have suggested <possible causative mechanisms for the progressive cardiac dysfunction observed in patients with sepsis> (fig.” [need to determine the underlying causal mechanism of the progressive cardiac dysfunction observed in patients with sepsis]
45. “<the causative mechanisms of pah-related health effects on the molecular level are not completely understood>, and epigenetic mechanisms may be involved.” [need to determine the underlying mechanistic cause of pah-related health effects on the molecular level]
46. “learning more about these causative mechanisms will allow us to develop sophisticated and successful therapies to prevent abnormalities.” [the consequences of understanding the mechanistic cause, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
47. “we ought to admit that statements typically found in articles and grant proposals such as "causative mechanisms of transplant vasculopathy are not completely understood" can only deceive.” [a statement about the statement ‘causative mechanisms…’ and that they are deceiving, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
48. “reviews noted <the universal setting of renal failure but not the cause> [20–22].” [need to determine the underlying cause of renal failure]
49. “<an incisional biopsy may cause a misdiagnosis or a delay in diagnosis>, as reported in the literature [11].” [need to determine the underlying cause of a misdiagnosis or delay in diagnosis, including an incisional biopsy]
50. “all five vim variants exhibited very similar cd spectra, with a slight deviation in ellipticity at lower wavelengths, indicating <that the amino acid substitutions do not cause major perturbations in secondary structure> (fig.” [need to determine the underlying cause of major perturbations in secondary structure even if it does not include amino acid substitutions]
51. “he criticised public health studies as lacking rigour with respect to specified hypotheses, bias, poor data, and unsound attribution of cause.” [a criticism of public health studies that includes an unsound attribution of cause generally, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
52. “[35] showed that using the maximum slope method as a reference standard was likely to cause a slight underestimation of the true perfusion value because of the long injection duration of the protocol.” [a limitation due to a slight underestimation of the true perfusion value, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
53. “<this might be caused by differences in allele substitution effects across populations>, due to the presence of non-additive effects and differences in allele frequencies across populations [37].” [need to determine the underlying cause of this, which includes differences in allele substitution effects across populations]
54. “sepsis, defined as a life-threatening organ dysfunction caused by a dysregulated host response to infection, according to the third international consensus definitions for sepsis and septic shock [1], is one of the leading causes of death in the intensive care unit (icu), despite significant recent advances in intensive care medicine [2,3].” [a statement about the definition of sepsis that includes the cause of a dysregulated host response to infection, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
55. “a systematic literature review indicated that <other possible causes for palatal groove include head flattening, tube pressure in the oral cavity and altered lingual function> [13].” [need to determine the underlying cause of palatal groove, including head flattening, tube pressure in the oral cavity and altered lingual function]
56. “(a) (i) in heparin-loaded (500 nm), acutely isolated dum neurons in tea- and ttx-containing saline, a voltage step from −90 mv to 0 mv causes a calcium inward and a calcium-activated potassium outward current accompanied by an intracellular calcium signal.” [a methodological statement about what happens when a voltage step from -90 mv to 0 mv is applied, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
57. “[13] cochrane's first landmark work occurred in cardiff, south wales, where he spent many years trying to determine <the effect of tuberculosis versus dust in causing progressive pulmonary fibrosis>—the rhondda fach study.” [need to determine the underlying cause of tuberculosis versus dust on progressive pulmonary fibrosis]
58. “a contrast-enhanced ct scan was performed which showed an ill-defined intra axial mass in left parietal region with significant surrounding edema causing mass effect and midline shift to the right side.” [a patient test that showed a cause of an ill-defined intra axial mass that led to a mass effect and midline shit to the right side (a medical test), not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
59. “in recent years, researchers have found that <elastin, an important component of cardiovascular prostheses, is one of the main causes of calcification>, which plays a critical role in the long-term implantation of the prostheses [69].” [need to determine the full underlying cause of calcification, including elastin]
60. “the main causes of patient visits were chronic care after trauma or neurological diseases or their sequelae.” [a statement about the main reasons (causes/issues) why patients visit the doctor, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
61. “EXAMPLE” [EXAMPLE]
62. **CONSEQUENCES**
63. “a growing body of evidence suggests that <overexploitation has had severe consequences for many wildlife populations> and has driven a number of species to extinction [10].” [need to determine the effects of overexploitation on many wildlife populations (the cause)]
64. “since neurons process information by membrane voltage changes, <the consequences of such a signaling pathway for brain development and function may be multi-fold and hard to foresee at this point>.” [need to determine the effects of such a signaling pathway for brain development and function (the cause), including multi-fold]
65. “gait impairments in pd are an important target of therapeutic interventions because of their prevalence and consequences.” [gait impairment in pd has medical/functional consequences and thus should be a target of therapeutic interventions, not a research question that discusses an incomplete understanding of how the cause leads to its effects with a need to determine it]
66. “according to the current review, we recommend to divide antidepressants into three categories based on the severity of cardiovascular adverse consequences including (1) the safest drugs including those drugs with cardio-protective effects on ventricular function, as well as cardiac conductive system including selective serotonin reuptake inhibitors, (2) neutralized drugs with no evidenced effects on cardiovascular system including serotonin-norepinephrine reuptake inhibitors, and (3) harmful drugs with adverse effects on cardiac function, hemodynamic stability, and heart rate variability including tricyclic antidepressants, serotonin antagonist and reuptake inhibitors, and noradrenergic and specific serotonergic antidepressants.” [a statement about how to categorize antidepressants using severity of cardiovascular adverse consequences, not a research question that discusses an incomplete understanding of how the cause leads to its effects with a need to determine it]
67. “EXAMPLE” [EXAMPLE]
68. **ESTABLISH**
69. “a comprehensive experiment investigating the dose-dependence is required <to establish a more accurate estimate of the optimal percentage of ks leaves which has minimal toxic effects>.” [need to determine a more accurate estimate of the optimal percentage of ks leaves which has minimal toxic effects (need to determine the cause of different percentages of ks leaves to ensure minimal toxic effects)]
70. “these cats were recruited as controls <to establish reference intervals for serum urea nitrogen, creatinine, and sdma concentrations>.” [need to determine the reference intervals for serum urea nitrogen, creatinine, and sdma concentrations (need to determine base levels to see the effect of changes)]
71. “the results establish that the cfs was reliable within a uk undergraduate student sample, providing support for the english version of the cfs to be used in western population samples.” [the results suggest that the cfs was reliable within a uk undergraduate student sample, not a research question that aims to determine the cause of some effects]
72. “although mediation analysis still does not concretely establish a causal pathway, it provides an additional step that none of these previous studies have been able to take.” [a methodological statement about mediation analysis that it does not lend itself to create causal pathways, not a research question that aims to determine the cause of some effects]
73. “EXAMPLE” [EXAMPLE]
74. **EXPLAIN/ EXPLANATION**
75. “red prohibiting signs designate migration barriers (note that the barrier in the form of the gulf of riga was clearly identified by the analysis, whereas <the city of riga and its surrounding infrastructure are proposed to explain the evidence for a barrier in that approximate location>).” [need to determine the underlying cause/explanation of a barrier in that approximate location]
76. “<known susceptibility loci together can only explain about 6–8% of the disease heritability of iga nephropathy (igan)>, suggesting that there are still a large number of genetic variants remained to be discovered.” [need to determine the underlying cause/explanation of the disease heritability of iga nephropathy (igan)]
77. “we now explain in more detail the results presented in [15].” [the authors will provide explanation of the results in [15], not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
78. “the patient has exhibitionism and when she want to explain or complain from a pain she expose the respective area.” [a statement about how the patient explains her pain, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
79. “<the likely explanation for the homogeneous distribution of group c> is that it is the most long-established group of the four, and that it was widespread in the study area before the severe population bottleneck in estonia and latvia in the mid-1960s.” [need to determine the underlying cause/explanation of the homogeneous distribution of group c, including that it is the most long-established group of the four…]
80. “a very likely early determination of the sites of the future metamorphosis of walking legs into gonopods and a segmentation process according to the multiplicative model may provide <a detailed explanation for the distribution of the extra gonopods in the homeotic specimen>.” [need to determine the underlying cause/explanation of the distribution of the extra gonopods in the homeotic speciman]
81. “moreover, these articles lacked consistency in the explanation of bias, validity, and precision, leaving the reader potentially confused with their meaning.” [a statement abou the types of explanations in the articles, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
82. “a detailed demonstration of this method comparison, with explanation of the settings chosen for steppco , is provided infigure s3.” [a statement about details and explanation provided in figure s3, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
83. “EXAMPLE” [EXAMPLE]
84. **INVESTIGATING/ INVESTIGATION**
85. “highly mobile species such as wolf, brown ( ursus arctos ) and black bear ( u. americanus ) make suitable study species for <investigating large-scale spatial and temporal population processes in large carnivores>.” [need to determine large-scale spatial and temporal population processes in large carnivores (need to determine the effects of large carnivores)]
86. “there are no studies <investigating the optimum duration of β-adrenergic blockade therapy>, which remains unknown.” [need to determine the optimum duration of β-adrenergic blockade therapy, (need to determine the effects of the therapy)]
87. “our study was not aimed at <investigating why there is an increase in m2 production during acute exacerbation>.” [need to determine why there is an increase in m2 production during acute exacerbation (need to determine the effects of the increase)]
88. “this method only allows the use of pdd in the bladder whereas the use of systemic (oral) photosensitizer is needed when investigating the upper tract.” [a methodological statement about the use of pdd that allows clinicians to explore the upper tract, not a research question that needs to determine/investigate the effects of the cause]
89. “we also suggest a design principle for angle-robust reflection by investigating the angular response of the reflection spectra with respect to the periodicity of arrayed one-dimensional structures.” [a methodological statement about a design principle that allows an exploration of angular response of the reflection spectra, not a research question that needs to determine/investigate the effects of the cause]
90. “in many institutions, ce-cta is employed as the initial study of choice for <investigation for vascular disease>, particularly given the now widespread availability of multislice technology.” [need to determine the underlying cause of vascular disease using the ce-cta study]
91. “to the best of our knowledge, the present study is the first <investigation to test the relationship between the myotrophin polymorphism and cardiac hypertrophy>.” [need to determine the underlying causal relationship between the myotrophin polymorphism and cardiac hypertrophy]
92. “the number of renal angiographic investigations performed is detailed in fig.” [a statement of the contents of a figure that includes the number of procedures completed, not a research question that needs to determine/investigate the effects of the cause]
93. “the approach to generating person-centered trajectories in the present investigation was exploratory do in part to sample size limitations.” [a statement about the current exploration approach, not a research question that needs to determine/investigate the effects of the cause]
94. “EXAMPLE” [EXAMPLE]
95. **MECHANISM/ MECHANISMS/ MECHANISMS UNDERLYING/ MECHANISTIC/ MECHANISTIC UNDERSTANDING/**
96. “in the present study, to improve understanding of <the protective mechanism of c5ara on hyperoxia-induced lung injury>, the levels of tnf-α, il-6 and mcp-1 were examined in the lung tissue and balf, following administration of 100% oxygen and/or c5ara.” [need to determine the underlying protective mechanism of c5ara on hyperoxia-induced lung injury]
97. “<one potential mechanism might be that sequestration of pe through surface-expressed pfemp1 parasite adhesins may cross-link the corresponding host adhesion receptor, chondroitin sulfate a1, on the syncytiotrophoblast surface>.” [need to determine the underlying mechanism, including the sequestration of pe through surface-expressed pfemp1 parasite adhesins…]
98. “the mechanism could support the handoff for the communication even when the source and destination are mobile.” [a physical object that could support the handoff for the communication, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
99. “in haploreg v4.1, all the 8 snps were annotated esnps, indicating that <rasgrp1 variants are likely to influence disease through mechanisms regulating gene expression>.” [need to determine the underlying mechanisms between rasgrp1 and disease, including regulating gene expression]
100. “the description of empirical growth plots provided by the present study provides hypotheses for future studies that integrate variable-centered and person-centered methods to test hypothetical mechanisms that may vary across groups who show differing trajectories of cognitive ability and cognitive recovery.” [a statement about the empirical growth plots and what types of analyses they allow including testing hypothetical mechanisms, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
101. “recently, an experimental study was conducted to identify <the mechanisms underlying the beneficial effects of β-adrenergic blockade therapy in sepsis>.” [need to determine the mechanisms underlying the beneficial effects of β-adrenergic blockade therapy in sepsis]
102. “therefore, defining <the mechanisms underlying synaptic plasticity> is not only pivotal for our understanding of how the brain functions but also for managing the behavioral, learning, memory and cognitive defects that are met in clinical practice.” [need to determine the mechanisms underlying synaptic plasticity]
103. “the exact function of il-10 in glioma is not clear; further studies are required to elucidate <the mechanisms underlying the association between il-10 polymorphisms and glioma patient prognosis>.” [need to determine the underlying mechanisms of the association between il-10 polymorphisms and glioma patient prognosis]
104. “although <definitive mechanistic studies of rgs1 in these diseases have yet to be performed>12, some findings suggest that high expression of rgs1 could promote retention of proinflammatory cells.” [need to determine the underlying mechanism of rgs1 in these diseases, including that high expression of rgs1 could promote retention of proinflammatory cells]
105. “thus, <our data provide an important mechanistic insight into how emi1/emi2 interact with and inhibit the apc/c>.” [need to determine the underlying mechanism of how emi1/emi2 interact with and inhibit apc/c]
106. “[12-14] are cautious in according either generality or <key mechanistic importance to these patterns>, but diverging views have been also expressed [14].” [need to determine the underlying mechanism of these patterns and their importance]
107. “while combining modalities and conducting integrative analyses is essential for mechanistic and system biology studies, our results suggest that performing multi-modal high-throughput biomedical studies is in most cases unwarranted for predicting clinical phenotypes and outcomes and special care must be given to analytic methodology.” [a general statement about mechanistic biology studies, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
108. “a useful approach may be to screen human populations for biomarkers of exposures as well as mechanistic intermediates and assess relationships with mediation analyses to aid in establishing biological pathways.” [a specific approach to screen human populations that includes intermediates in the mechanism, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
109. “studies of environmental gradients are critical to developing <a mechanistic understanding of how biotic and abiotic factors regulate species diversity and distributions> [1].” [need to determine the underlying mechanism of how biotic and abiotic factors regulate species diversity and distributions]
110. “thus, <the conceptual model provides a mechanistic understanding to mass–migration in prey fish>.” [need to determine the underlying mechanism of mass-migration in prey fish, including the conceptual model proposed]
111. “however, post-operative seizure freedom is currently sub-optimal, suggesting that the pre-surgical assessment may be improved by taking advantage of a mechanistic understanding of seizure generation in large brain networks.” [a statement that the mechanism of seizure generation should be taken into account in pre-surgical assessment, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
112. “in this presentation, i will touch on several of the aforementioned issues and delineate present and future strategies that could help improve our mechanistic understanding and translational successes.” [a statement about the contents of the presentation, including the ways to improve understanding the mechanism, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
113. “EXAMPLE” [EXAMPLE]
114. **UNDERLIE/ UNDERLYING/ UNDERLYING MECHANISMS/ UNDERLYING… MECHANISMS**
115. “thus, this study’s goal was to elucidate <novel biological relationships that may underlie leukemogenesis>.” [need to determine the underlying mechanism of leukemogensis]
116. “these data thus suggest that <reduced jnk activity in md3 morphants underlies the eye morphogenesis phenotype>.” [need to determine the underlying mechanism of the eye morphogenesis phenotype, including reduced jnk activity in md3 morphants]
117. “<many different mechanisms are reported to underlie these alterations.>.” [need to determine the underlying mechanism of these alterations]
118. “we model the secretion of slime by considering a regular square lattice that underlies the cells.” [a statement that the regular square lattice physically is underneath the cells, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
119. “the surgeon should focus on preservation of the facial nerve branches that underlie the tumor without compromising adequate excision of the tumor.” [a statement that a surgeon needs to be careful with the facial nerve branches that are physically under the tumor, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
120. “while <the underlying reason for this enhanced interaction between 4e-t and cnot1/7 in the absence of eif4e binding> is not known, it is in line with our previously observed increase of reporter mrna decay bound by 4emut (figure 5f).” [need to determine the underlying cause/mechanism of this enhanced interaction between 4e-t and cnot1/7 in the absence of eif4e binding]
121. “therefore, a representative neurophysiological model of human snc dopaminergic neurons will be useful in studying <the molecular processes underlying pd>.” [need to determine the underlying mechanism/ molecular processes of pd]
122. “also note that we have used standard mac protocol of ieee 802.15.4, i.e., csma/ca, as underlying mac protocol.” [a methodological statement of what is underneath the mac protocol (csma/ca), not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
123. “rather, virtually all growth plots represented dynamic changes in underlying abilities over time.” [a statement about a person’s inherent abilities and the plot of them, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
124. “<the underlying mechanisms as to why baseline levels of m2 activation are related to the evolution of ae in ipf> are unclear.” [need to determine the underlying cause/mechanism of why baseline levels of m2 activation are related to the evolution of ae in ipf]
125. “such approaches, which comprise the predominant statistical methods for predicting outcomes in behavioral research, allow strong hypothesis tests about underlying mechanisms (19,20).” [a general statement about approaches that help test the underlying mechanism, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
126. “although previous studies have suggested that myocardium can release stress factors which contribute to the development of hypertrophy and heart failure [6], <the underlying molecular mechanisms are still not clearly understood>.” [need to determine the underlying molecular mechanisms]
127. “thus two organisms, although they may differ in both the underlying genetic mechanisms and in the complexity of the environment in which they live, may have similar phenotypic complexities.” [a statement about the differences between two organisms based on their respective underlying mechanisms, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
128. “EXAMPLE” [EXAMPLE]
129. **UNDERPIN/ UNDERPINNING/ UNDERPINNINGS/**
130. “uncovering biochemical design principles that <underpin such response dynamics> is a prerequisite to understand evolved signalling networks and to design synthetic ones.” [need to determine the underlying mechanism/cause of such response dynamics, including uncovering biochemical design principles]
131. “while the majority of arms show balanced translocation with fusion of pax3:fox01 or pax7:fox01 , recent publications suggest that driver mutations (e.g., nras, kras, hras, fgfr4, pik3ca, ctnnb1, fbxw7, and bcor ) may <underpin progression in the embryonal subtype of rms (erms)> [4,5].” [need to determine the underlying mechanism/cause of progression in the embryonal subtype of rms (erms)]
132. “in this regard, our quest is to describe <the mechanisms which underpin cell wall construction> and which endow it with sufficient plasticity to support expansion, growth and infection [9–11].” [need to determine the underlying cause/mechanism of cell wall construction]
133. “funding agencies worldwide have been called upon to finance informatics research and to promote tools and digital libraries that will underpin the shift towards a big new biology paradigm (hey et al.” [a statement about a shift towards a big new biology paradigm based on new tools and digital libraries, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
134. “the use of biophysical ecosystem service indicators where possible is advantageous because these are independent of market fluctuations and are more closely related to the ecosystem functions that underpin service delivery [50].” [a justification of biophysical ecosystem service indicators because they are similar to the ecosystem functions physically underneath service delivery, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
135. “the higher incidence of seizures in our population deserves further investigation, as <the mechanism underpinning this effect is unresolved>.” [need to determine the underlying mechanism/cause of this effect]
136. “however, <the molecular aberrations underpinning these differences remain largely unclear>.” [need to determine the underlying mechanism/cause of these differences, including the molecular aberrations]
137. “first, the presumption underpinning the study was that all the patients involved in the study had similar perceptions regarding the questions in the questionnaire.” [a statement of an assumption underneath the study, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
138. “a large database of serial cross-sectional samples of pwid attending needle and syringe programs (nsp) in australia (1998–2008) was used to develop a statistical model underpinning the tool.” [a statement of the statistical model that the tool relies on, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
139. “placebo response in the clinical trial setting is poorly understood and alleged to be driven by statistical confounds, and <its biological underpinnings are questioned>.” [need to determine the underlying biological mechanism/cause of it (placebo response)]
140. “thus when developing our scoring and classification algorithms in the future, it will be important to discard such features, unless we can find theoretical underpinnings for them.” [a general statement of inclusion/exclusion criteria that includes excluding if there is no theoretical basis for them, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
141. “EXAMPLE” [EXAMPLE]
142. **UNDERSTANDING**
143. “<this should lead to better understanding the operation of different behavioral change processes within these groups>, and to facilitate more effective, personalized treatment approaches.” [need to determine the underlying cause/mechanism of the operation of different behavioral change processes within these groups]
144. “in the present study, <to improve understanding of the protective mechanism of c5ara on hyperoxia-induced lung injury>, the levels of tnf-α, il-6 and mcp-1 were examined in the lung tissue and balf, following administration of 100% oxygen and/or c5ara.” [need to determine the underlying mechanism/cause of the protective mechanism of c5ara on hyperoxia-induced lung injury]
145. “despite advances in <our understanding of the pathophysiology of sepsis>, the mechanisms of sepsis-induced cardiomyopathy have not been fully elucidated.” [need to determine the underlying cause/mechanism of the pathophysiology of sepsis]
146. “twenty-five articles from 1993 to 2000 were written to assist the everyday physician in understanding and then applying the literature to the particular patient at hand.” [a statement about articles written to specifically help physicians understand and apply the literature to their patients, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
147. “this situation resulted in bad feelings and impressions regarding mental health clients, feelings of inadequate profession, uncomfortable with patients, colleagues and hospital environment, a sense of loneliness and weakness, feelings of frustration, struggling with dependency and poor understanding of the meaning of patients’ behaviors.” [a statement about the situation resulting in a poor interpretation of patients’ behaviors by staff, not specifically a research question that discusses an incomplete underlying cause of a phenomenon with a need to determine the underlying mechanism]
148. “EXAMPLE” [EXAMPLE]
149. **EXAMPLE**
150. “EXAMPLE” [EXAMPLE]
151. “EXAMPLE” [EXAMPLE]