

Diseased Science

"It is more important to know what sort of person has a disease than to know what sort of disease a person has."— attributed to Hippocrates

Arturo Casadevall and Ferric C. Fang

We have recently observed a widespread affliction of scientists known as *impact factor mania* (1), also referred to as *impactitis* (2), for which there appears to be no cure. This has led us to consider whether additional unrecognized medical conditions may be unique or overrepresented among scientists.

Ahypothesemia. Characterized by the absence of a hypothesis. Some scientists have hypothesized that this is a problem (3). See also *hypothesisis*.

Amnesia Originosa. An inability to recall the actual origin of an idea that one now regards as one's own. Afflicted individuals are able to present other's ideas as their own without guilt or attribution to the original source.

Appendiceal Hypertrophy. A relatively new condition that first became manifest when journals began to allow supplementary data. Authors suffering from appendiceal hypertrophy stuff their papers with supplementary data irrespective of its relevance, perhaps hoping to induce data overload and reviewer fatigue. Reviewers, in particular those suffering from *experimentitis infinitum* (see below), may aggravate appendiceal hypertrophy by demanding additional information of uncertain value. Preventive measures include charging extra fees for supplementary data analogous to the taxes imposed on tobacco use.

Areproducibilia. The inability to obtain the same experimental result twice (4). This is not necessarily a problem for individuals who publish irreproducible results and simply move on to leave other scientists to deal with the problems (5, 6). However, recurrent *areproducibilia* may impair scientific reputation as subsequent work by the individual is not considered credible.

Borderline Probability Disorder. Afflicted individuals may dismiss the potential importance of results with $P = 0.06$ while unquestioningly accepting the importance of results with $P = 0.05$ (7). See also *significosis*.

CNS Depression. The feeling after one's paper has been rejected by *Cell*, *Nature*, and *Science* (1). The malady generally abates once the paper is published in a lower-tier journal.

Dogmatitis. 1. Manifested by a courageous adherence

to one's principles (benign). 2. Manifested by perversely clinging to disproven ideas (malignant).

Editorial Dysfunction (ED). A condition experienced by authors in which prolonged periods of unresponsiveness to one's submitted manuscript are punctuated by brief intervals of false hope that finally terminate in rejection.

Experimentitis Infinitum. A condition exhibited by reviewers who always demand more experiments irrespective of the amount of data already provided (8, 9). Also known as *status revisicus*.

Gelatophobia. The fear of getting scooped. Gelatophobia may lead to the premature emission of a manuscript to a journal before it is ready.

Gotchalism. A disease of reviewers who think they have spotted a fatal flaw in experimental design (10).

Honorreha. An obsession with seeking or receiving awards. Tends to become chronic. See *Nobelitis*. There is no known cure for such individuals can never be satisfied.

Hyperacute Rejection. A condition in which the rejection email arrives in your inbox before the confirmation of submission (11).

Hyperpromotosis. The recurrent overestimation of the importance of one's own findings and the zeal exhibited in broadcasting one's accomplishments are pathognomonic signs.

Hypothesisis. Characterized by an inability to recognize that not all research requires a hypothesis (3, 12). See *mechanitis*.

Impact Factor Mania. Also known as *impactitis* (2). A condition in which the perceived value of scientific work is based on the impact factor of the journal where the work is published rather than the content of the work itself (1). A highly contagious and debilitating condition for which there is no known cure, although effects may be mitigated by the DORA initiative (13).

Inflammatory Vowel Disease. Characterized by the recurrent excretion of irate letters to the Editor.

Irritable Brain Syndrome (IBS). Common symptoms are alternating periods of flowing ideas and constipated thinking. May be complicated by bouts of cerebral flatulence.

Mechanitis. A condition exhibited by scientists who misuse the words “descriptive” and “mechanistic” while failing to recognize that careful description is essential to science and mechanisms are relative to the vantage point of the observer. The illness can be mitigated by reading our essays on these topics (3, 12) several times a day until symptoms subside. Prognosis is generally good although relapses may be frequent.

Myiasis. A condition characterized by the repeated and excessive use of the word “my,” as in *my lab*, *my discovery* and *my paper*. The malady often coexists with *priorititis* (see below). The etymological relationship to a disease involving parasitic maggots is purely coincidental. Victims of myiasis fail to recognize that any scientific discovery reflects the contributions of many individuals. Myiasis may have serious long term debilitating effects because it irritates colleagues and can lead to social isolation. Therapy is most effective if administered by scientists of higher rank.

Nobelitis. A rare but debilitating condition afflicting only the scientific elite (14). May be manifested by auditory hallucinations involving telephone callers with Swedish accents. Seasonal incidence is frequently observed with rising anticipation in early Fall followed by prolonged depression once the prizes are awarded and the afflicted individual has not been selected.

Obstinatus ani (OA). A condition characterized by stubbornness out of proportion to the available evidence. See also *dogmatitis*. OA has notably affected individuals in the fields of AIDS causation, climatology and vaccine research (15). The diagnosis of OA can be made by asking an individual to state the evidence required to alter their stance and observing the (lack of) response. There is no known cure.

Obfuscous Incommunicado (OI). A condition characterized by the inability of an individual to express themselves clearly. Afflicted individuals speak or write only in incomprehensible jargon-laden prose. The *ennui* subtype is contagious and produces a sleep disorder of audiences. Potentially treatable through courses and workshops on scientific communication.

Obsessionis Curriculum Vitae (OCV). An unhealthy preoccupation with the length of one’s resume. Variants include obsession with citation count and h-index.

PNAS Envy. The sensation experienced when congratulating a colleague on their election to the National Academy of Sciences. Once affected individuals are elected to the academy, the condition may progress to *Nobelitis*.

Polyauthoritis. An emerging disease involving manuscripts in which the number of authors exceeds the number of data points.

Priorititis. A condition characterized by a need for an individual to make the case for his/her priority in a scientific discovery (16). Priorititis is frequently associated with

narcissism and may coexist with *myiasis* and *amnesia originosa*. If untreated, priorititis can lead to bitterness and social isolation.

Pseudohypoegotism. A condition characterized by insincere displays of humility. Afflicted individuals are known to exhibit recurrent humble-bragging, as in “I’d like to acknowledge the little people who really did all the work,” “I am so humbled to receive this prestigious award,” or “I felt so awkward receiving the prize from the King of Sweden because surely there are many more deserving scientists out there.” *Pseudohypoegotism* is a generally benign condition with few consequences for science. However, pseudohypoegotism can be an irritant to chronically exposed colleagues.

Publicititis. A condition characterized by insatiable cravings for publicity and media recognition. Individuals with publicititis may badger institutions and journals to issue press releases for their work. Some authorities consider publicititis to be a variant of *hyperpromotosis*.

Retention Deficit Disorder. The inability to recall anything from the lecture you just heard or the article you just read.

Significosis. Manifested by a failure to discern between biological and statistical significance (6). Individuals with significosis fail to realize that just because something is unlikely to have occurred by chance doesn’t mean it’s important (17). See also *Borderline Probability Disorder*.

Slime Disease. Individuals with this condition are observed to explain any biological phenomenon in terms of biofilms.

If you recognize any of these symptoms, please see a (real) doctor immediately. You may be a scientist.

REFERENCES

1. Casadevall, A., and F. C. Fang FC. 2014. Causes for the persistence of impact factor mania. *MBio* 5:e00064-14.
2. Van Diest, P. J., H. Holzel, D. Burnett, and J. Crocker. 2001. Impactitis: new cures for an old disease. *J. Clin. Pathol.* 54:817-819.
3. Casadevall, A., and F. C. Fang. 2008. Descriptive science. *Infect. Immun.* 76:3835-3836.
4. Casadevall, A., and F. C. Fang. 2010. Reproducible science. *Infect. Immun.* 78:4972-4975.
5. Begley, C. G., and L. M. Ellis. 2012. Raise standards for preclinical cancer research. *Nature* 483:531-533.
6. Prinz, F., T. Schlange, and K. Asadullah. 2011. Believe it or not: how much can we rely on published data on potential drug targets? *Nature Rev. Drug Discov.* 10:712-713.
7. Olson, C. H. 2014. Statistics in *Infection and Immunity* revisited. *Infect Immun* 82:916-920.
8. Ploegh, H. 2011. End the wasteful tyranny of reviewer experiments. *Nature* 472:391.
9. Williams, E. H., P. A. Carpentier, and T. Misteli. 2012. Minimizing the “re” in review. *J. Cell. Biol.* 197:345-346.