

## Introduction to the Ethics of Scientific Conflict of Interest (COI)

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Ethics consists of the fundamental issues of practical decision making, such as the standards by which human actions can be judged right or wrong and how to prioritize competing values. Scientific progress necessitates the ethical conduct of research. Some examples of ethical research behaviors include honest reporting of methods and results, fair allocation of credit, humane treatment of experimental subjects, and the proper handling of resources and waste. However, there are many more ethical considerations in scientific research, and this document seeks to introduce one of the less recognized and understood situations: the conflict of interest (COI), also referred to as a competing interest.

### Defining Scientific Conflict of Interest (COI)

Scientists should allow free inquiry and the free exchange of non-confidential and private ideas and THIS is the cornerstone of academic progress and is key to advance scientific knowledge. The core ethical value of **Trust** is essential. A relationship based on trust is important not just among scientists, but also between scientists, the government, and of course, the public.

**Fundamental to this trust is objectivity in the execution, interpretation, and dissemination of research. Therefore, conflict of interest (COI) can be severely damaging to the scientific community, which is why its identification and proper handling should be a priority (1).**

A basic working definition of COI is a situation in which a secondary interest, such as financial or other personal considerations, has the potential to unduly influence the primary interest of objectivity in research conduct. Such a situation can bias one's professional judgment and compromise the integrity of the results. Therefore, a COI involves the abuse (actual, apparent, or potential) of the trust that others have in the research being performed or in the scientists involved. It is important to note that COI is NOT considered misconduct in research, since the definition of misconduct is limited to fabrication, falsification and plagiarism (2). However, a seminar concentrating on COIs organized by the Esteve Foundation in April 2009 suggested that COIs are an unappreciated basis of much of the impropriety in scientific research and publication often recognized by other forms of misconduct (3).

COIs amongst scientific leaders and research scientists, as one understands it today, has existed as long as there have been individuals curious about life and nature. In many ancient societies, the concept of conflict of interest may not have been recognized. But even as ancient Greek or the Roman civilizations, it was generally accepted that scientific leaders and philosophers would not take advantage of their positions in society to advance their own personal interest through dishonest means. At the advent of modern industrial societies, the notion has taken even stronger

hold that scientific research should be expected to be conducted ethically and that personal interests should be separated from professional scientific decision making (4)

A wide range of behaviors and circumstances may be involved in COI, and they appear in different settings and across all scientific disciplines. However, all COIs involve the use of a person's authority for personal or financial gain, which may be at the individual or institutional level. COIs may also be broadly divided into two categories based on the potential reward: intangible, such as those involved in academic activities and scholarship, and tangible, such as those involved in financial interests.

At the individual level, objectivity is the essential condition for truthful scientific discovery, although individual bias in interpretation and judgement of research findings is practically impossible to eliminate. Many subtle pressures can influence how we perceive and how we act. All scientific professionals understand the pressure to publish, to obtain funding and appointments, and to earn respect from peers. In the pursuit of success, bias can influence judgment and diminish objectivity in many ways. Bias can be difficult to recognize and even more difficult to control. It can influence the framing and selection of research questions, the choice of research design, the selection of research participants, and the methods by which data are collected, analyzed, interpreted, and ultimately disseminated (5). Whether one describes the proverbial glass as "half full" or "half empty" may be influenced by what one expects or desires the results to look like, or how one wants to represent those results to others.

### **Identifying Conflicts of Interest**

Since many COIs involve personal interests or financial arrangements, all scientific practices, even commonly occurring business practices, should be evaluated to be sure that they will not introduce biases or preferences into scientific judgments or research interests. Generally, if an individual enjoys any unearned financial benefit, even a benefit as minor as a free meal, COI may be suspected. When publishing, all potential COIs should always be disclosed.

Relationships to family, friends and colleagues can be arranged along a continuum from the very close and intimate to the distant and detached, so it can be particularly challenging to recognize conflicts of interest that arise from personal relationships. Any time a pattern of preference emerges that cannot be explained based on shared assessments, proven competence, or empirical facts, a COI may exist. Such patterns may occur in referrals, hiring decisions, and evaluation of employees, students, or colleagues.

The following are some common examples of scientific COIs:

- self-dealing, the act of advancing one's interests in conflict with responsibilities to others
- Conflict of effort (also called a conflict of commitment), where an outside activity conflicts with one's primary employment
- Nepotism, the act of awarding employment advantages preferentially to family or friends
- Offering or accepting gifts or favors to influence decision making
- Suppression of data that contradicts the desired outcome
- Disseminating confidential information outside its intended audience

- Influence peddling, the act of using one's authority to benefit another

Appendix 1 lists two case studies, which describe potential COIs and their implications. These case studies may elicit varying responses, highlighting the difficulty in both identifying COIs and determining how best to respond to such situations.

### **What to Do About Conflicts of Interest**

Three possible responses to COIs fall into three categories: *avoid*, *disclose*, and *recuse*.

The best course of action, when possible, is to avoid situations that give rise or may appear to others to give rise to COIs. In commercial and financial scientific matters, avoidance is by far the best strategy. This does not mean that all non-wage benefits must be rejected, but it does mean that some should be prohibited and that all should be scrutinized. Scientists should not accept gifts or benefits unless it can be demonstrated that such gifts or benefits (6)

- primarily contribute to the welfare of persons served professionally
- do not reasonably appear to bias professional judgment
- do not diminish the dignity or autonomy of the professions or the professionals.

Disclosure is often associated with recusal. When one sits on a committee or board that makes decisions about the advancement of others or the distribution of resources and benefits to others, a COI may require individuals to withdraw or recuse themselves from consideration or decision. This may occur because of the professional's interests in or personal ties to one or more of the parties being considered. By disclosing the nature of the association and by stepping out of the decision-making process, the professional ensures that any personal preferences or biases she or he may have will not unfairly influence the deliberations in favor of one candidate over others.

COIs can occur in teaching, research, and clinical/medical practice (7). They may be visible (and for that reason comparatively easy to identify and avoid) or extremely subtle. No code of ethics can be framed that will accurately identify all the forms such conflicts can take. This monograph attempts to do two things in a general way: (1) give some guidance in identifying conflicts of interest: and (2) suggest what should be done when a COI is identified. Individuals may also wish to access the websites of other professional organizations that have adopted guidelines concerning COIs (8).

Conflicts of interest will never go away. Intangible and tangible COIs will always exist as personal and professional relationships becomes more complex. New strategies to manage, reduce, or eliminate COIs will continue to be a necessity in combating this challenge. All scientific professionals must be vigilant against COIs that may compromise objectivity and, if exposed, catalyze the loss of trust in scientific research. Being transparent with potential biases/conflicts is critical for all individuals.

## **The Chemical Professional's Code of Conduct**

The American Chemical Society (ACS) has a Chemical Professional's Code of Conduct, which is reproduced below. This text serves to outline the ethical behavior expected of professionals in the field. ACS also supports several groups within its governance that seek to raise awareness of ethical considerations in the sciences, including the Committee on Ethics. Many other institutions also provide resources to foster an understanding of scientific ethics and misconduct, such as the Office of Research Integrity of the National Institutes of Health Office in its extensive revised 2019 publication *Introduction to the Responsible Conduct of Research* (9).

“Chemical professionals should seek to advance chemical science while striving for the highest standards of scientific integrity. This includes sharing ideas and information, keeping accurate and complete records, and giving due credit to the other contributions of others. Undisclosed conflicts of interest and scientific misconduct, including fabrication, falsification, and plagiarism, are incompatible with this code.”

“Chemical professionals should be aware of laws and regulations related to the professional conduct of science to ensure that their profession is practiced safely and appropriately.”

“Chemical professionals should be actively concerned with the health and safety of co-workers, consumers, and the community. Professionals have a responsibility to serve the public interest and to further advance scientific knowledge. This includes ensuring that public comments are made with care and accuracy to avoid unsubstantiated, exaggerated, or premature statements.”

“Chemical professional should treat others with respect and will not engage in discrimination, harassment, bullying, dishonesty, fraud, misrepresentation, coercive manipulation, censorship, or other misconduct. Such actions apply to all professional, research, and learning environments, regardless of whether the action alters the content, veracity, or meaning of research findings, and regardless of whether or not the action affects to planning, conduct, reporting, or application of science.”

“Chemical professionals should take responsibility to act or intercede where possible to prevent misconduct. This includes reporting suspected research misconduct, as well as any discrimination, harassment, bullying, dishonesty, fraud, misrepresentation, coercive manipulation or censorship.”

“Chemical professionals should be mindful of implicit Bias and unconscious Bias and strive to avoid all Bias based on race, gender, age, religion, ethnicity, nationality, sexual orientation, gender expression, gender identity, presence of disabilities, educational background, or other personal attributes.”

“Chemical professionals should strive to do their work in ways that are safe and sustainable for the environment. This includes continuing to work to develop sustainable products and processes that protect the health, safety and prosperity of future generations.”

“Chemical professionals should serve clients faithfully and incorruptibly, respect confidentiality, advise honestly and charge fairly. Additionally, they should promote and protect the legitimate

interests of their employers, comply with safety policies and procedures, fulfill obligations, and safeguard proprietary and confidential business information.”

“Chemical professionals should strive for continual professional growth both personally and more broadly in the tutelage of others as a trust conferred by society. Professionals have a responsibility to understand limitations of their knowledge, remain current with developments in their field, learn with and encourage others”.

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## [The Chemical Professional's Code of Conduct - American ...](#)

<https://www.acs.org/content/acs/en/careers-services/ethics/the-chemical-professionals-code-of-conduct>

## Appendix 1

### Case Study A:

Dr. Conrad has received a grant from an industrial source to do basic research with long-term implications for commercialization. A new graduate student, Ms. Lawless, has just joined his lab. Dr. Conrad outlines several projects that can be pursued by Ms. Lawless under this industrially sponsored research program. Dr. Conrad indicates that there is a requirement listed in the industrial grant agreement, which says that all material to be submitted for publication must first be reviewed by the company. This review must always be completed within 120 days. Dr. Conrad points out that this presents only minimal disruption to the normal publication process as compared to the unrestricted publication of material sponsored by federal research grants. He also mentions that the positive aspects of working on this proposal include the fact that there is money in the grant for Ms. Lawless to travel to at least two meetings per year. Also, the grant application provides money for a personal computer that will be placed at Ms. Lawless lab station while she is working on the project. Dr. Conrad emphasizes that working on the project will likely give Ms. Lawless an "inside track" with the company should she want to pursue job possibilities there following graduation. Ms. Lawless agrees to work on the project. Comment on the ethical and conflict-of-interest implications of this scenario.

### Case Study B:

Mr. Asset, a graduate student of Dr. Bond, has been conducting physicochemical studies on the properties of a new polymer. The research is sponsored by Chemical Industries, Inc., and it is understood by Mr. Asset and Dr. Bond that the results are proprietary, confidential, and cannot be used in Mr. Asset's thesis. Mr. Cash, the technical liaison from Chemical Industries, meets with Mr. Asset and Dr. Bond to express his pleasure with the outcome of the recent studies. Mr. Cash observes that the new results are the last data required to market a new generation of fire-resistant electrical insulating material. Mr. Cash further comments that this is the product that Chemical Industries, Inc. needed to regain its market share, and the stock of Chemical Industries, Inc. would soar once investors knew of the new product. That evening at dinner with his wife and brother-in-law, an investment banker, Mr. Asset tells them about Mr. Cash's enthusiasm about the prospects of Chemical Industries' stock once the new product was announced. The next day, Mr. Asset's brother-in-law advises several of his clients to purchase stock in Chemical Industries. Did Mr. Asset breach his confidentiality agreement by discussing his research results with his wife and brother-in-law? Does Mr. Asset profit by the disclosure of the research results that will increase the value of the stock in Chemical Industries.? Discuss a scientist's responsibility for maintaining the confidentiality of research results.