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► **To cite this version:**

Comité Ethique, Jean-Gabriel Ganascia. COMETS OPINION 2016-33 - HOW CNRS CAN RESPOND TO SCIENTIFIC INTEGRITY VIOLATIONS. 2016. hal-02929792

HAL Id: hal-02929792

<https://hal.science/hal-02929792>

Submitted on 3 Sep 2020

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HOW CNRS CAN RESPOND TO SCIENTIFIC INTEGRITY VIOLATIONS

Opinion no. 2016-33 approved in June 2016

I. SUMMARY

This position paper focuses on how CNRS can implement the principles set out in the National Code of Ethics for Research Professions, which it signed in January 2015 along with a large number of French research institutions. The Code of Ethics falls within the framework of the French law on ethics and the rights and obligations of officials of 20 April 2016, and takes the general concern for ethics into account at European level.

This position paper identifies various practices that violate scientific integrity, ranging from fraud – including plagiarism and the fabrication and falsification of results – to non-disclosed conflicts of interest. It explores the issues in relation to their exposure once they have been identified and how institutions handle the allegations made. COMETS believes CNRS should encourage and facilitate the internal submission of reliable allegations of misconduct or fraud against staff in its research units. It suggests that CNRS would benefit from appointing an integrity officer alongside the ombudsman to receive fraud allegations from laboratories and organise a response, in liaison with the Institutes' deputy scientific directors and the National Scientific Research Committee (CoNRS). This officer could also work in cooperation with advisers in each main academic field. Whatever system CNRS chooses to put in place, COMETS believes it is especially important to provide a single, easily accessible and clearly identified point of entry for allegations of fraud. This raises the question of whistleblower protection. COMETS would like to see greater transparency in how the institution handles cases of fraud and the penalties imposed as a result. In position paper, COMETS reflects on the risk posed to scientific integrity by putting pressure on publications. It sets out recommendations for reversing this trend, based on researcher and project evaluation practices especially. It also suggests that results are published with raw data where applicable. Finally, COMETS underlines the need to put in place training in scientific integrity for all research staff at CNRS in accordance with the National Code of Ethics for Research Professions, which it has promised to enforce in partnership with universities and other research bodies.

Keywords: integrity, fraud, officer, whistleblower, transparency, training

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II. SELF-REFERRAL

This paper falls within the framework of the French law (2016-483) of 20 April 2016 on ethics and the rights and obligations of officials and its provisions with regard to conflicts of interest. It also takes into account the texts concerning whistleblowing and whistleblower protection. Its implementation is an extension of the National Code of Ethics for Research Professions signed in January 2015 by CNRS together with all French universities and a large number of research institutions in France. This code serves as a national version of the key international texts in this area. Its preamble states that "It is the responsibility of every public teaching and research body or institution to implement this code by promoting good research practices (...) and by putting in place clear and widely recognised procedures to prevent and address any deviations from ethical standards." Respecting scientific integrity is a national and international concern. The French State is particularly focused on this issue and has launched a commission initially responsible for offering a postgraduate training course in research ethics. The Science-Europe association – of which CNRS is a member –

has published a text on preserving scientific integrity intended for inclusion in the Horizon 2020 programmes at European level.

This position paper published by COMETS falls within this evolving framework. It follows the publication of the committee's guide "Promoting integrated and responsible research" in 2014, which was distributed to all stakeholders in CNRS research units. It also develops two previous reports published in 2006 ("Scientific fraud at CNRS") and 2012 ("The need to implement procedures with a view to promoting research integrity at CNRS"). COMETS believes that effective methods should be put in place on every level to prevent malpractice in research professions as much as possible. Generally speaking, this relates to any integrity violation that leads to the publication of erroneous or non-reproducible results – especially fraud. This includes the fabrication or falsification of results, plagiarism and non-disclosed conflicts of interest.

The National Code of Ethics advises research staff to expose any cases of fraud they may be aware of. In view of these recommendations, COMETS examines the most suitable procedures for receiving allegations of scientific integrity violations at CNRS. After considering the increasing role played by social networks in exposing cases of fraud in its position paper "Discussion and moderation of scientific publications on social networks and in the media", COMETS believes it is necessary to clarify and develop these procedures further. It also offers suggestions on how to limit violations of best practices and calls for the consideration of ethics training and research integrity for all types of staff.

III. ANALYSIS

A. INTEGRITY VIOLATIONS TAKE VARIOUS FORMS

The most serious integrity violations concern the publication of fraudulent results. The publication of unreliable and non-reproducible results due to the falsification or even complete fabrication of experiment data is an extremely serious matter. Integrity violations also include seeking to influence results in one way or another by adopting biased research protocols and omitting results that deviate from the researcher's expectations. The latter often occurs when there are non-disclosed conflicts of interest or private contracts are at stake. Researchers' actual contribution to writing published articles is also a common cause of conflict. Finally, plagiarising publications or parts of publications constitutes a major source of fraud. Such practices – which extend beyond the list given here – undermine research integrity and damage science and its public image to varying degrees. There are also issues associated with their exposure and how institutions handle them once they have been identified.

ENCOURAGING THE INTERNAL SUBMISSION OF ALLEGATIONS OF MISCONDUCT OR FRAUD

In 2015, the scientific community in France was shaken by the discovery of falsified data in several publications written by a CNRS research director. The fraud was exposed by the PubPeer website and made public on the Retraction Watch website. The case was widely reported in the press and media while the institution was still investigating the matter. This raised questions from research and public stakeholders, as the President of CNRS pointed out in an article in the CNRS Journal. The seriousness of the alleged misconduct was established by an ad hoc committee of experts whose identity remained anonymous. The institution's management imposed harsh penalties after an investigation by a joint committee (Commission Administrative Paritaire or CAP).

This sequence of events highlighted the role played by social networks in exposing scientific misconduct. Although research institutions can no longer ignore social media (see COMETS' position paper from 6 April 2016), COMETS believes that CNRS would benefit from addressing these questions sooner rather than later to prevent such information being disclosed on social networks as far as possible. In view of this, CNRS must put in place a suitable framework for the submission of allegations of misconduct or fraud against staff in its research units. It must then provide an appropriate response by evaluating the allegations and taking appropriate measures, as well as preventing the spread of slanderous allegations. This suggestion reflects the French Council of State's recommendations, which advise companies and administrations to introduce a range of whistleblowing mechanisms internally and then externally before considering public disclosure (Proposal no. 2).

There are many advantages to handling allegations internally. It prevents anonymous accusations, which is an unpopular practice in France (see COMETS' position paper published in April 2016). Furthermore, teams can search for solutions before tensions

become too great and put a stop to unethical practices as soon as they arise. Finally, it prevents the development of rumours that could be potentially damaging to science and its public image.

B. RECEIVING ALLEGATIONS OF INTEGRITY VIOLATION

Remember that CNRS has signed the National Code of Ethics, which advises research staff to expose any cases of fraud they may be aware of. This presupposes the use of clear procedures by CNRS to receive allegations in the event of such practices being identified internally or by scientists who are familiar with the field. CNRS must facilitate access to mechanisms for all at the appropriate level. The institution must also discuss the procedures that need to be put in place, taking into account the international and European context especially. These issues are currently under consideration at ministerial level in France with respect to all research institutions. COMETS advises CNRS to put in place clear procedures for receiving allegations so that reported cases may be investigated, provided that they are based on justifiable evidence. COMETS believes the anonymous submission of allegations should be avoided to prevent the risk of malicious behaviour or hidden conflicts of interest. However, the whistleblower's identity must remain confidential to minimise the risk of reprisals against individuals. The methods of maintaining confidentiality have yet to be defined. A single point of entry is important in this respect.

The ombudsman at CNRS currently receives allegations at national level in principle. The ombudsman is responsible for helping to resolve disputes and difficulties that arise in the internal running of the institution, as laid down in his statute. The ombudsman plays a crucial role and addresses a wide range of relational and constitutional problems, as well as disputes in relation to publications. COMETS advises CNRS to appoint an integrity officer to work alongside the ombudsman, like other research institutions and universities. The integrity officer would be responsible for receiving fraud allegations from laboratories and organising a response, in cooperation with the Institutes' deputy scientific directors and the CoNRS. The ombudsman takes action in respect of malicious allegations. The integrity officer at CNRS could work in cooperation with integrity officers from other research institutions who are facing problems of a similar nature. This would soon establish a national network, which would enable a collective response to cases of integrity violation involving several institutions. The integrity officer must have a scientific background and a good understanding of the research system in order to perform the necessary duties and anticipate the potential impact of fraud. The question of the integrity officer's position in relation to CNRS management remains open, and the officer may or may not be part of a network of integrity officers designated by Institutes for each general subject area. Note that institutions often appoint researchers near retirement to perform this function, after they have previously held positions of responsibility in research. These researchers wish to be of use to their institution without the risk of being personally involved in any problems that come to light.

In addition to receiving allegations, the integrity officer could work with a network of CNRS advisers to monitor scientific research and identify and analyse the most relevant information concerning publications that appear on dedicated websites, such as PubPeer, Pubmed commons etc. The integrity officer would also be able to launch an investigation in the event

of repeated allegations of fraud being made against a CNRS researcher Overall, COMETS believes that whatever system is put in place at CNRS, it is especially important to clearly identify and facilitate access to the point of entry for allegations of fraud. It should be very visible on the CNRS website and communicated to all research unit directors as well as new entrants.

C. PROTECTING WHISTLEBLOWERS WHO REPORT SCIENTIFIC FRAUD

Difficulties may arise when a whistleblower reports a case of fraud. Individuals who report a fraud should be clearly aware of the seriousness of their actions and that the allegation must be based on reliable scientific arguments. Any allegation is likely to have a significant impact on the smooth running of the laboratory concerned and could damage its image and the discipline more widely. The whistleblower should therefore contact the laboratory director first in order to address the problem downstream and deter anyone who might have been tempted by the fraud. However, the head of the research unit may not be in a position to solve the problem in some cases. This person could even be involved in the worst case scenario. In most other cases, the head of the research unit is not trained in how to resolve these situations; this is why it is vital that CNRS research unit staff have access to a national mechanism.

As allegations must not be made anonymously, it is important to protect whistleblower confidentiality. The institution must also ensure that any allegation of fraud within a team does not have a damaging effect on the career or personal life of the individual who made the allegation. This is important for young researchers and research support staff who are in a particularly vulnerable position because their careers might depend on the head of the team or laboratory director, who may be implicated in the fraud or have a connection to the person who is. These problems can only be addressed on a case by case basis. With respect to the issues raised when an allegation is made, COMETS believes it is particularly important for CNRS to consider the protection of whistleblowers. This reflection may fall within the framework of the law on ethics in the public sector, which mentions the protection of whistleblowers explicitly. This protection should be extended to temporary employees, such as postgraduate and postdoctoral students, as suggested in a study by the French Council of State (Proposal n°3).

D. HANDLING ALLEGATIONS OF FRAUD

Allegations must be handled as quickly as possible using clearly identified procedures. Procedures for handling cases of fraud consistently and in line with international regulatory frameworks must be clarified, as they have been in a number of other countries. It must be possible to apply the same procedures in other cases of suspected misconduct, such as those relating to the misappropriation of results obtained by other researchers.

Generally speaking, CNRS appoints one or several researchers to carry out an investigation. In addition to the required skills and integrity, researchers must receive prior training in order to fulfil the brief. They should be given information on the legal and

institutional framework within which they operate. Their task must be clearly defined and they must receive the necessary means to carry out their duties, which includes access to all the documents required for the task.

It is the institution's responsibility to put concrete measures in place if the commissioned reports conclude that the authors of a publication have violated scientific integrity. These conclusions must be sent to the team in question to calm any tensions that may have arisen, with support from the HR department if necessary. CoNRS will carefully monitor activities carried out by the team to ensure that such behaviour does not reoccur in the future. Authors of offending publications will be required to publish corrective statements and ask the publisher to retract the publications if necessary. As the French Council of State highlights in its study, provisions in relation to whistleblowers tend to overlook the issue of follow-up action. Finally, COMETS would like to see an annual report on cases of fraud handled by the integrity officer, without the identity of those involved being revealed. As outlined in the COMETS 2007 report on scientific fraud at CNRS, it is important for this committee to be able to refine its assessment of research integrity in France and get some perspective on these issues so that they can be better addressed in future.

E. PUTTING LESS PRESSURE ON RESEARCHERS TO INCREASE THE NUMBER OF PUBLICATIONS

Global awareness of the urgent need to prevent publication malpractice has been rapidly increasing over the past few years. The growing number of participants at the World Conference on Research Integrity (WCRI) is testament to this. Malpractice obviously refers to cases of serious fraud, including falsified observational data as discussed earlier, which require investigation and result in penalties. However, there is a grey area of questionable research practices that are becoming much more frequent (unsuitable or unreliable methodologies, disputes over the authorship of articles etc.). These are mentioned in The European Code of Conduct for Research Integrity and in the guide "Promoting integrated and responsible research" published by COMETS. Although not as serious, these integrity violations have a negative impact on the credibility of published research and are also harmful to researchers' careers, human relationships in laboratories and science's social image. Numerous international analyses agree that these lapses are partly the result of too much pressure on researchers to publish a high volume of work and in high impact scientific journals, which are thought to be the most prestigious. Putting less pressure on researchers is therefore highly recommended in more ways than one. Such pressure comes down to the criteria used to assess researchers' abilities at the beginning and throughout their careers as well as their submissions in response to calls for papers. The Leiden Manifesto provides excellent guidance on the proper use of bibliometric indicators. Remember that COMETS criticised the overenthusiasm for major high impact journals of a generalist nature in a position paper published in 2014. Their limitations are condemned by the San Francisco Declaration on Research Assessment (DORA). COMETS can only urge CNRS to clarify fair assessment methods on a regular basis – particularly for members of CoNRS. These methods should be primarily based on the detailed analysis of a few major publications while also making good use of quantitative indicators.

PREVENTING LAPSES IN INTEGRITY BY PUBLISHING DATA

This is about more than just appealing to researchers' sense of responsibility. It is vital to address the underlying causes that have gradually distorted the publication system – if such a thing were still possible. Prevention methods must be envisaged to ensure lapses in integrity become less frequent. A useful idea would be to make raw data systematically available alongside published results at the time of publication. However, this only applies to certain fields. This will prevent researchers from publishing results too quickly without checking their reproducibility. This means there will be less opportunity to deliberately falsify results. It will also help experts verify the results in the event of any suspicion. Certain publishers, such as PLOS, are beginning to insist on this in order to avoid retractions.

Such measures are not possible in all fields and obstacles must be removed before they can be put in place. Moreover, the data must be provided in a format that can be clearly understood by another expert. Making the data shareable creates additional work. COMETS believes that researchers should be given credit for taking the time to make raw data accessible as part of an overall assessment. COMETS previously recommended publishing raw data in its position paper "The ethical issues of scientific data sharing" in 2015. Making data available on dedicated platforms and the opportunities provided by open archives such as HAL have helped to increase transparency. Remember that these methods fall within the international framework of Open Science, which COMETS is strongly in favour of.

F. RESEARCH INTEGRITY TRAINING

COMETS reiterates that the code of ethics supports the need for integrity and responsibility in research professions. These principles have been clarified in many previous reports and especially in the guide "Promoting integrated and responsible research", which is now distributed to all new entrants at CNRS. COMETS encourages the widespread availability of this guide, which is regularly updated and intended to be an evolving tool. The head of each unit should also encourage its discussion in the laboratory, in accordance with the provisions laid down by the law on ethics in the public sector concerning the role played by heads of department. It seems particularly important to raise awareness and even offer specific training for team leaders alongside essential postgraduate training. What matters most of all in practice is the exemplary role played by teaching staff, as everyone knows. Training in research ethics will also become crucial within the framework of European projects carried out as part of the Horizon 2020 initiative and certain international collaborations. COMETS urges CNRS to work with institutional partners to ensure that researchers are encouraged to complete training in ethics and professional codes of practice. CNRS has an obvious role to play in the national effort to put in place online training modules in research integrity, designed to raise awareness and encourage all staff to consider these issues. Online modules are supported by classroom training sessions given by individuals within the field of academia, if possible. This work should especially be carried out with universities that have already developed specific frameworks for ethics and codes of practice. Means are required to put these systems in place, and CNRS could offer ongoing training in order to achieve this. Continuing these efforts to offer integrity training would put CNRS in a position to investigate the motives behind fraud across all disciplines.

IV. RECOMMENDATIONS

COMETS believes CNRS must put in place a suitable framework for the submission of allegations of scientific integrity violations against staff in its research units and address these allegations internally in a timely manner, in accordance with the National Code of Ethics for Research Professions. Adopting this approach will ensure cases are handled sooner rather than later and in a measured way, without the pressure of distribution via social networks.

It is strongly recommended that research staff communicate proven scientific misconduct either in their team or in the context of collaborations as soon as any tangible evidence is found to support the allegations, while being fully aware of the seriousness of the matter. A single point of entry for allegations made by whistleblowers must be established if it is impossible or useless to contact the laboratory director. This must be made clearly visible on the home page of the CNRS website and indicated by the laboratory director to all staff and all new entrants.

COMETS advises CNRS to appoint an integrity officer, like an increasing number of universities and other research bodies. The integrity officer would be responsible for receiving allegations of fraud and organising a response, in cooperation with the Institutes' deputy scientific directors and the CoNRS, with assistance from the ombudsman where required. Supported by a network of officers in each main disciplinary field, the integrity officer would be able to work in partnership with integrity officers from other research institutions facing similar problems.

COMETS urges CNRS to consider the best way of offering special protection for whistleblowers who make allegations of scientific fraud. The first step towards protecting whistleblowers is to receive allegations in the strictest confidentiality. It is important to remember that young researchers and research support staff are in a vulnerable position within the hierarchical structure of certain teams.

COMETS recommends that CNRS announce cases of fraud and the penalties imposed if these allegations are proven internally as well as externally, within the framework of the law. COMETS would like to be informed about cases of serious misconduct on a regular basis so that the committee can refine its analyses of CNRS researchers' behaviour, not just at institutional level but also in relation to observations at national and international level.

Within the framework of Open Science, COMETS believes CNRS should strongly encourage researchers to provide access to the raw data on which published results are based. COMETS reiterates the importance of helping to ensure there is less pressure on all CNRS researchers to publish prolifically. Recommendations on this subject for CoNRS members, including advice on the proper use of bibliometric (quantitative) indicators, must be clarified and regularly updated.

COMETS reminds CNRS of the need to raise awareness and provide training for all research staff on the general code of good research practices. It advises CNRS to work with other research institutions – especially universities – to put in place online training modules in research integrity. It recommends offering specific training on a regular basis and making the necessary means available. Training may even be made compulsory for laboratory directors as well as new entrants.

June 2016