Reporting on research misconduct: lessons from whistleblowing legislation – and back again

Olivier Leclerc

CNRS, CTAD (UMR 7074), Université Paris Nanterre, Nanterre, France[1]

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Abstract: Regulations on reporting research misconduct have undergone a remarkable process of development since the 1980s. At the same time, many states have also developed legislation governing the receiving of alerts and for protecting whistleblowers against reprisal. Although these two bodies of legislation share the aim of organising the practice of reporting, they have been developed in isolation from each other, and without sufficient thought as to how they should be linked. Based on an analysis of European Union law and its transposition in France, this article identifies the convergences and divergences between whistleblowing legislation and the reporting of research misconduct. It then looks at the contributions that each body of law can make to the other, both in terms of the procedures applicable and the protection afforded to whistleblowers. The lessons learned from the comparison of whistleblowing law and the procedures for reporting scientific misconduct allow for the identification of avenues for improvement.

Keywords: whistleblowing legislation; research misconduct; procedure; protection of whistleblowers; research integrity officers

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Introduction

In their overview of research on scientific integrity, Aubert Bonn and Pinxten (2019) pick out whistleblowing as a topic that is seldom explored. This may be considered an undesirable consequence of the fragmentation of research fields, a phenomenon that is regrettably familiar. On the one hand, we have a vast literature on whistleblowing, predominantly in law, management, and anthropology (Brown et al. 2014), which focuses

[1] Centre de théorie et analyse du droit (CTAD UMR 7074), Université Paris Nanterre, 200 avenue de la République, 92 001 Nanterre Cedex, France; olivier.leclerc@cnrs.fr ; ORCID: https://orcid.org/0000-0001-5148-7603

mainly on violations of the law, criminal offences, and risks to public health or the environment, and disregards research misconduct. And while, on the other hand, the literature on research misconduct consistently refers to "whistleblowers," few studies conducted within that field have paid attention to the literature on whistleblowing in general (Swazey and Scher 1981; Edsall 1981; Perzan 1992; Price 1998; Devine and Reaves 2016; Dougherty 2018; Freckelton 2020; Reitz and Higgins 2022). This observation may seem paradoxical, considering how closely these two areas are entwined.

Coverage of cases of research misconduct in the American media dates back at least to the early 1980s (Broad and Wade 1982; Kevles 1998). The lacklustre response from the universities involved was highlighted in Congressional hearings, which eventually led the Public Health Service and the National Science Foundation, as well as several research universities, to enact internal regulations for reporting and handling research misconduct. The origins of this regulation have been studied thoroughly (NAS 1992, 98; Perzan 1992; Erwin, Gendin, and Kleiman 1994; Steneck 1994, 1999; Lafollette 1992, 21, 1994a, 1994b; Guston 2000, 86; Price 2013). Without reiterating this history, it is worth emphasising how much whistleblowers were valued from the outset as key players in the maintenance of scientific integrity: "when necessary, serious and considered whistle-blowing is an act of courage that should be supported by the entire research community" (NAS 1992, 15).

In the absence of specific rules for whistleblowing within the research field, reporting in the United States was initially based on existing whistleblower protection legislation, in particular the False Claims Act (FCA), a law passed in 1863 for the detection of misappropriation of federal funds; it was argued that where research was funded by federal agencies, misconduct in such research fell within the scope of that law (Willcox 1993, 145; Parrish 1997, 7). But the argument had its limitations. First, the FCA was not enforceable if the research was not supported by federal funds. Moreover, as Perzan (1992, 662) points out with regard to the possibility, opened up by the FCA, for private plaintiffs to act on behalf of the United States (*qui tam* action) and so to benefit from protection against retaliation, "Congress never envisioned that private-plaintiff actions would apply to scientific misconduct" and therefore "its use in alleged instances of scientific misconduct is inappropriate."

The limitations of federal whistleblower legislation (Vaughn 1989, 2012, 127) thus led authors (Jackson and Prado 1983; LaFollette 1992, 137; Resnik 1998a, 125) as well as learned societies (Chalk 1988, 32; AAAS 1990) to advocate for the introduction of dedicated reporting procedures for research misconduct. This resulted in standards for reporting research misconduct and protecting whistleblowers being established by various scientific regulatory bodies, such as the National Science Foundation (NSF 1987, 2002), the US Department of Health and Human Services (DDHS 1989, 2000, 2005; ORI 1995), and the Office of Science and Technology Policy of the Executive Office of the President (OSTP 2000).

These pioneering developments in the United States have had a far-reaching influence around the world. In the following years, the Singapore Statement on Research Integrity adopted at the 2nd World Conference on Research Integrity emphasised that "research institutions, as well as journals, professional organizations and agencies that have commitments to research, should have procedures for responding to allegations of misconduct and other irresponsible research practices and for protecting those who report such behavior in good faith" (WCRI 2010, §12). In Europe, the Memorandum on scientific integrity drawn up by the European Academies of Science (ALLEA 2003, §6) called on universities to put in place procedures to deal with reports of research

misconduct and protect whistleblowers. This encouragement is also reflected in the European Code of Conduct for Research Integrity, which includes as research misconduct the "improper dealing with infringements, such as attempts to cover up misconduct and reprisals on whistleblowers" (ALLEA 2011, 1.3). The revised version of the Code urges research bodies to "protect the rights of 'whistleblowers' during investigations and ensure that their career prospects are not endangered" (ALLEA 2017, 3.2). The need to protect whistleblowers who expose research misconduct was also affirmed by the OECD Global Science Forum (OECD 2007, pt. 6, 2009, pt. 5), the European Network of Research Integrity Offices (ENRIO 2019), and many European countries (e.g. in Germany: DGF 1997, 2019; in the Netherlands: NWO 2001, 2018, 2019; in France: INSERM 1998, Corvol 2006, RESINT 2018, RESINT 2023).

The emphasis on the merits of reporting research misconduct contrasts with the limited consideration of how these reports would relate to whistleblowing procedures already established in other areas. This gap is all the more problematic given that, in parallel with the gradual development of research misconduct reporting procedures since the late 1980s, whistleblowing legislation has also been fleshed out and refined in many countries, including the United States (Kohn 2007; Vaughn 2013), the UK (Public Interest Disclosure Act 1998), Australia (Public Interest Disclosure Act 2013), Ireland (Protected Disclosure Act 2014) (Fasterling 2014; Apaza and Chang 2017; Thüsing and Forst 2016). In the European Union, Directive 2019/1937 of 23 October 2019 (Abazi 2020, 2021; Van Waeyenberge and Davies 2021) profoundly overhauled the area by requiring EU Member States to transpose its provisions by December 2021 and to significantly strengthen whistleblowing procedures and protections for whistleblowers.

This article contends that the near-total estrangement that has prevailed until now between whistleblowing law and the reporting of research misconduct can no longer be sustained. It is necessary, now more than ever, to integrate and to better articulate the reporting of research misconduct and the wider processes for alerts. Moreover, whistleblowing law can provide a powerful lever for clarifying and improving the procedures for reporting research misconduct. Yet it is also important to take into account the specific nature of allegations of misconduct made in the context of research, in which the scientific methods and practices used by the alleged perpetrator stand in need of verification, for this involves recourse to the knowledge that is specific to the scientific communities themselves.

This study contributes to research on the legal regulation of scientific integrity, based on an analysis of French law and European Union law, and their implementation in French research institutions and universities. The experience of France is indeed particularly instructive in this respect, for France already had an advanced framework for handling whistleblowing, based upon laws adopted in 2013 and 2016 (Leclerc 2017). This legislation was then amended to comply with the requirements of the European Directive by the law 2022-401 of 21 March 2022 and the decree 2022-1284 of 3 October 2022. It is worth noting that the debates that preceded the adoption of that legislation in the French Parliament made no reference to whistleblowing in research, even though the legislative framework for reporting research misconduct was developed during the same period.[2]

[2] Following the Corvol report (2016), France has introduced regulations requiring universities and research institutions to comply with research integrity requirements. Law No. 2020-1674 of 24 December 2020 and Decree No. 2021-1572 of 3 December 2021 impose on them the appointment of research integrity officers, the implementation of reporting procedures, and the provision of

Similarly, research integrity regulations were developed without any consideration of how these reports would relate to the wider whistleblower legislation. Ultimately, it is as if alerts made in the public interest were to be kept separate from reports of violations in research practice. However, this situation is now undergoing significant change, for the legal developments that have affected both whistleblowing and research misconduct reporting since 2016 are bringing the two reporting mechanisms increasingly closer, yet without this convergence having been properly thought out and without any thought of controlling its consequences. For the research misconduct reporting procedures established in French universities were intended to ensure the self-regulation of science; but now, with the developments in national whistleblowing legislation, although the self-regulation of science is not challenged per se, the management of research misconduct is increasingly being attracted into the orbit of national legislation designed for reporting other types of misdemeanour, viz. violations of the law, crimes and offences, and risks to public health and the environment. Therefore, in addition to the country's distinctive legal and regulatory features, the case of France is a relevant site for studying how whistleblowing and reports of scientific misconduct can be articulated with each other, thus providing a pathway to a better comprehension of scientific self-regulation in its relationship with state law.

Building on the provisions of the European Directive of 23 October 2019 and its transposition into French law, Section 1 analyses the bridges that may be found in the legal and regulatory frameworks between whistleblowing and the reporting of research misconduct in France. The remainder of the article examines the consequences of bringing these legal regimes together, looking in section 2 at the consequences for the procedures for reporting misconduct, and in section 3 at the impact on the protection afforded to scientists who speak out. The article concludes by calling for a clarification of the legal regimes governing whistleblowing in relation to scientific misconduct in order to reconcile the best procedural guarantees and protections for whistleblowers with proper consideration of the particular character of reporting inappropriate research practices.

Section 1: At the interface between whistleblowing and reporting research misconduct

How whistleblowing procedures relate to the reporting of research misconduct hinges largely on the understanding of what is meant by research misconduct. Beyond the question of whether research misconduct consists only of fabrication, falsification, and plagiarism, or also of questionable research practices (Resnik, Rasmussen, and Kissling 2015), should it include all the other reprehensible behaviours that may pertain to labour relations, such as harassment, breaches of safety in the workplace, and criminal offences? In the late 1980s, the panel convened by the US Academies of Science, Technology, and Medicine agreed that the dedicated reporting channels for research misconduct should be separated from those established to receive reports of "other misconducts – such as theft, harassment, or vandalism – that may occur in the research environment" (NAS 1992, 15). Similarly, the European Code of Conduct of Research Integrity in its initial version noted that

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training on research ethics and scientific integrity for doctoral students. Furthermore, PhDs must take an oath when defending their thesis to respect the principles and requirements of research integrity throughout their professional career, whatever the sector or field of activity (decree of 26 August 2022).

> Misbehaviour such as intimidation of students, misuse of funds and other behaviour that is already subject to universal legal and social penalties is unacceptable as well, but is not "research misconduct" since it does not affect the integrity of the research record itself. (ESF/ALLEA 2011, 1.3)[3]

This allows for the existence within research institutions of different whistleblowing procedures: to report research misconduct, on the one hand, and violations of the laws of the country in which the research is conducted, on the other.

The 2019 Directive does not challenge this distinction. It requires EU Member States to provide for the collection of reports and the protection of whistleblowers within its scope, which does not include scientific integrity. In French universities and research institutions, this results in a fragmented landscape: research misconduct must be reported to the Research Integrity Officer (RIO);[4] violations of the law, crimes, and offences and harm to the public interest must be reported to an in-house whistleblower officer (internal reporting channel) or to the external authorities responsible for receiving them (external reporting channel).[5] The situation is further complicated by the fact that an ethics officer (*référent déontologue*) must also be appointed to advise scientists who are employed as civil servants on possible professional issues, such as conflicts of interest or the combination of several possibly incompatible professional activities.[6] In addition, 34 research and expertise institutions must maintain a special register for the reporting of alerts concerning health and environmental risks and ethical infringements in the conduct of research or expertise in these domains.[7]

However, the unchecked proliferation of reporting standards in France has undermined the clear distinction between reporting violations of the law and reporting research misconduct. Indeed, French whistleblowing legislation provides for the reporting of all violations of the law.[8] And since, in parallel, scientific integrity has been integrated into the law (Article L211-2 of the Research Code) and defined as "the set of rules and values that must govern research activities in order to guarantee their honest and scientifically rigorous nature" (Decree no. 2021-1572 of 3 December 2021), it follows that research misconduct now constitutes a violation of the law and might therefore be subject to alerts in accordance with the ordinary whistleblowing legislation. It is therefore likely that a report of research misconduct will be sent by a scientist via a

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[3] The revised version of the Code published in 2017 envisions "due regard for the health, safety and welfare of the community, their collaborators and other parties connected with their research" as "good research practice" (2.4), but maintains a definition of research misconduct centred on scientific knowledge.

[4] Decree no. 2021-1572 of 3 December 2021. Similarly, the French Office of Scientific Integrity (OFIS) – which does not have an operational role as RIO but rather acts as an observatory of practices and as a coordinator – is only competent for questions of scientific integrity, "excluding disciplinary and penal questions relating to the treatment of breaches of scientific integrity" (circular of the Secretary of State for Higher Education and Research, no. 2017-40, 15 March 2017).

[5] Law no. 2016-1691 of 9 December 2016, amended by law 2022-401 of 21 March 2022, and decree 2022-1284 of 3 October 2022.

[6] The same person may act as both whistleblower and ethics officer (Decree 2022-1284 of 3 October 2022, art 5 II).

[7] Law no. 2013-316 of 16 April 2013.

[8] However, reports that infringe national defence secrecy, medical secrecy, the secrecy of judicial deliberations, the secrecy of judicial investigations or enquiries, or the professional secrecy of lawyers are not protected.

reporting channel that falls under the general whistleblower law and not the specific procedure for research misconduct. The choice to claim whistleblower status is strategic (Leclerc 2023), and heavily depends on the benefits that the whistleblower thinks he or she can get from it, by comparing the procedures to be followed to deal with the report and the protection he or she can obtain according to which channel of reporting is used.

Yet it is desirable that reports of research misconduct be subject to a dedicated reporting channel and to a procedure suited to their specific nature. Several ways to deal with this situation may be conceived. One is to redirect alerts that have been misdirected. Thus, the French network of RIOs (RESINT 2018, 6) invites RIOs to check whether the report referred to them does indeed constitute a possible violation of research integrity, and if not to send it to another contact person, including the above-mentioned whistleblower officer. Similarly, the CNRS provides that in the event of an allegation of research misconduct to the whistleblower officer, the latter shall refer the matter to the RIO (CNRS 2019, 32). Another solution, currently being discussed in France but yet to be implemented,[9] would be to set up a single portal that would dispatch the reports received to different specialised referents: RIO, whistleblower referent, ethics officer, or legal or human resources departments. However, this approach faces legal obstacles, as different legal regimes are applicable to research misconduct, violations of professional obligations of civil servants, and criminal offences, and these regimes impose different procedural guarantees.

Despite the research institutions' efforts to maintain a distinction between them, the legal regimes for whistleblowing and reporting research misconduct, as they are established in France, thus appear to be closely connected to each other. They would therefore benefit far more from cross-fertilization than from competition or continuing to coexist in artificial isolation.

Section 2: Consequences for procedures for reporting research misconduct

Directive 2019-1937 provides a number of clarifications on how alerts should be received and handled. Following its transposition, French law now gives much more precise detail on the procedural requirements for handling such reports. Independently, since 2016 French universities and research institutions have established procedures for reporting research misconduct. In order to reduce the disparities between the procedures implemented in universities, national and European RIO networks have sought to harmonize them (RESINT 2018, 2023; ENRIO 2019), although without their recommendations having any binding legal force. How can whistleblowing and research misconduct reporting procedures feed into each other? The answer to this question is not unequivocal, as each provides useful lessons in certain respects.

1. Lessons from whistleblowing legislation for reporting research misconduct

In several respects, the procedures established by Directive 2019-1937 for the collection and processing of the reports falling within its scope are very similar to the procedures established for the reporting of research misconduct. The Directive specifies the need for "channels for receiving the reports which are designed, established and operated in a secure manner that ensures that the confidentiality of the identity of the reporting person

[9] This avenue is being explored, for example, at the National Institute of Health and Medical Research (Inserm) as part of the LORIER programme (https://lorier.inserm.fr/).

and any third party mentioned in the report is protected, and prevents access thereto by non-authorised staff members" (Art 9). This requirement echoes the need for confidentiality in virtually all research misconduct reporting procedures. Similarly, the distinction between inquiry and investigation, that has long been established for handling research misconduct (NAS 1992, 100; DFG 1997; OSTP 2000; OECD 2007; DHHS 2005), is also provided for by the Directive (Art 11), which requires the authority receiving the alert to check that it does indeed constitute an alert as defined by the law before initiating investigations. In France, the RIO of the CNRS has received 150 reports since its creation in 2018, of which 78 were analysed as possible violations of research integrity and were thus investigated (CNRS 2023, 73).

But other provisions of the Directive are more innovative and offer possible guidance for the reporting of research misconduct. Firstly, the Directive sets a time limit within which the report must be processed: receipt of the report must be acknowledged within seven days; and the reporting person must be informed within a reasonable period, not exceeding three months, of the action taken on the alert. Similarly, the Directive allows an alert to be issued "in writing or orally, or both." If the report is made orally, a recording or transcript must be kept. Finally, it provides for the possibility, without making it compulsory, of anonymous reporting (Art 6(2)), a possibility that has always been the subject of much debate with regard to reporting on research misconduct (Chalk 1988, 23; Price 1998; ALLEA 2003, §6). These procedural requirements are in line with the imperative to deal with cases of research misconduct within a reasonable time period (DFG 1997, 2019, 23; OSTP 2000), while also specifying the periods of time that can actually be regarded as reasonable, it being specified that the authority receiving an alert may justifiably have the need to carry out longer investigations in complex cases. While this clarification of the time frame for processing reports is indeed welcome,[10] the demands it places on the RIOs, which in France sometimes operate with very limited material and personnel resources, should not be underestimated.

Secondly, Directive 2019/1937 takes a broad view of who can make an alert through the internal channel of the entities involved (Art 8.2). Reports can be issued not only by the entity's workers but also by "persons having self-employed status; shareholders and persons belonging to the administrative, management or supervisory body of an undertaking, including non-executive members, as well as volunteers and paid or unpaid trainees; any persons working under the supervision and direction of contractors, subcontractors and suppliers; reporting persons where they report or publicly disclose information on breaches acquired in a work-based relationship which has since ended." Processing through the internal reporting channel is one of the requirements for protection against retaliation. When applied to research misconduct, the personal scope of reporting channels covers a wide range of professional situations, whether permanent or temporary (post-docs, doctoral students, trainees, etc.), and even where they may have ceased at the time of reporting. In most research institutions, the channels for reporting research misconduct are available to all research staff, regardless of their status. But the Directive takes an even broader view, allowing all suppliers and subcontractors, as well as their employees, to report. This broader view is particularly relevant to research misconduct as it allows for reporting within consortia involving companies supplying scientific equipment or performing scientific tasks, for example measuring or imaging

[10] The effectiveness of these time constraints is, however, conditioned by the sanctions that each Member State of the Union may adopt, the Directive leaving this prerogative to the States (Abazi 2020: 653).

(Joerges and Shinn 2001; Kleinman and Vallas 2001; Shamoo and Resnik 2022, 83). This is all the more appropriate given that partnerships between public and private research funding bodies have grown dramatically in recent decades, with the associated risks of conflicts of interest (Korenman 1993; Resnik 1998b; Dugan, Lee, and Jandreau 2023), funding effects (Krimsky 2005; Sismondo 2008), and selective publication (Melander et al. 2003).

Thirdly, the Directive requires EU Member States to provide that whistleblowers will have the choice between reporting within their organisation through an internal reporting channel or to an external authority. The possibility of using an external reporting channel is intended to prevent whistleblowers from being exposed within their organisation and thus mitigate the risk of reprisals against them. Similarly, the possibility of referring to an external authority may prevent the internal authority from stifling the alert and not following it up appropriately (NAS 1992, 10). This dual pathway for whistleblowers is sobering as regards the reporting of research misconduct. Universities were very early on presented as most suited to receive reports of research misconduct (Chalk 1988, 24), yet a few States did set up centralised structures to receive reports (in the Nordic countries: Nylenna et al. 1999; in the Netherlands: ALLEA 2003, §7), the merits of which have been highlighted (ENRIO 2019, 3; ESF 2010). The path opened for whistleblowers by the Directive could revive the debate on the advisability of giving scientists an alternative between internal reporting and external reporting to a central authority. This scheme would have the merit of combining the advantages of local processing of alerts with the possibility of exporting their treatment when the author of the alert may reasonably have doubts that the alert would be processed effectively, or might fear that evidence would be altered.

2 Lessons from reporting research misconduct for whistleblowing law

Conversely, in other respects, the procedures designed for handling alerts would benefit from being inspired by those put in place for research misconduct.

With regard to reporting systems for research misconduct, the necessity to ensure transparency and adversarial investigations has been emphasised. Mishkin (1988) pointed out the need for due process, as academic investigations may affect the reputation, freedom, and income of individuals. In the case of research misconduct, in her view, due process requires inter alia adequate notice of established standards of conduct, conducting the investigation, preserving evidence and protecting individuals, coordinating the release of information, and holding hearings. The Global Science Forum of the OECD also emphasised the importance of fairness in dealing with misconduct, deeming the investigation process to be "quasi-legal" (OECD 2007, 9; see also ALLEA 2017, §3.2). The procedures for handling misconduct thus require that charges are communicated to the respondent, and that the respondent is given the opportunity to be heard in response and to present evidence to support their position. For example, the US Federal Policy on Research Misconduct states that safeguards for subjects of allegations "include timely written notification of subjects regarding substantive allegations made against them; a description of all such allegations; reasonable access to the data and other evidence supporting the allegations; and the opportunity to respond to allegations, the supporting evidence and the proposed findings of research misconduct (if any)" (OSTP 2000. See also DHHS 2005, §93.307, §93.310; ENRIO 2019, 15). In France, the network of RIOs (RESINT 2018, 7) demands a thorough and documented investigation, which includes "the collection of all relevant information, the examination of all evidence, the hearing of the persons implicated, possibly of the person who issued the alert and of any other person reasonably identified as having information to provide."

While central to the investigation of allegations of research misconduct, fairness does not have the same prominence in whistleblowing law. The 2019 Directive is silent on the adversarial nature of the investigation procedure following a report. Similarly, the French courts have ruled that the investigation following the filing of a report in a company need not include a hearing of the alleged perpetrator, or of all the persons behind the report (Mraouahi 2022; Leclerc 2022). The legal reason for this is that the investigation following an alert precedes the opening of a disciplinary procedure, for which French law does require that an adversarial procedure be followed. Thus, the investigation of alerts is considered to be aimed solely at characterising the facts concerned, on the basis of which the institutions employing the alleged perpetrator may decide whether or not to initiate a disciplinary procedure with a view to sanctioning them. The same argument is also sometimes made in relation to the reporting of research misconduct, on the grounds that "reserving procedural safeguards appropriate for trials to the adjudicatory phase of a misconduct case also facilitates the gathering of information" (Goldman Herman et al. 1994, 390). Similarly, it has been noted that a research misconduct investigation is much less formal than a trial and offers fewer elements of due process to the accused (Friedman 1993, s101). However, by requiring that the investigation is also governed by due process, even before any disciplinary proceedings, the regulations on research misconduct place a greater emphasis on fairness, offering better protection to individuals than whistleblower legislation in general.

Another area in which the regulation of research misconduct could usefully feed into whistleblowing legislation concerns the follow-up of the report in the event that the investigation concludes that there has been no violation of the law (Mishkin 1988, 125). In this context, scientific institutions have paid particular attention to restoring the reputation of the scientists involved. The ORI thus requires that biomedical or behavioural research institutions supported by the PHS justify the implementation of written policies and procedures for addressing research misconduct that include, among others, "All reasonable and practical efforts, if requested and as appropriate, to protect or restore the reputation of persons alleged to have engaged in research misconduct but against whom no finding of research misconduct is made" (DHHS 2005, §93.304(k)). The same holds in the UK for the Medical Research Council (MRC 1997), which details the steps that should be taken to ensure that

> all reference to the matter is expunged from the respondent's personal life. All persons who have been interviewed or otherwise informed of the charge will be notified in writing that the charges have been found to be without foundation. Respondents will be consulted regarding other actions that might be taken on their behalf to restore their reputations. (§8)

The European Academies (ALLEA 2003) have also pointed out that "the interests of the accused must be also protected in order to prevent damage to their reputation as a result of rumor." In France, the CNRS provides that "at the end of the investigation of a case of misconduct, if it is concluded that an agent has been wronged (e.g. plagiarised) or that they are not guilty of an accusation made against them, the CNRS will send them a short document attesting to this conclusion" (CNRS 2019, 34). The attention paid to the restoration of scientists' reputations reflects its importance in the construction of academic careers (Bourdieu 1984). Furthermore, it is always possible that the alleged misconduct was motivated by malicious intent or personal, economic, or scientific rivalries (Else 2023). Although restoring scientists' reputations remains difficult in practice (Lubalin and Matheson 1999; Sieber 1999; Van Portfliet 2022; Lewis 2022), it can be seen as equally necessary under ordinary whistleblowing legislation. However, the

2019 Directive leaves this issue entirely to the discretion of EU Member States. At most, it provides that "reports shall be stored for no longer than it is necessary and proportionate in order to comply with the requirements imposed by this Directive, or other requirements imposed by Union or national law" (Art 18.1). But the destruction of a report and related documents after processing is only a very partial aspect of restoring people's reputations and must be complemented by positive communication efforts on the absence of misconduct.

Section 3: Consequences for the protection of scientists reporting research misconduct

In addition to procedural issues, the question arises as to what protection can be offered to whistleblowers. The 2019 Directive requires EU Member States to take the necessary steps to prohibit retaliation, or attempted retaliation, against whistleblowers and against certain natural or legal persons linked to them or the entity responsible for the reported facts (Art 19). Whistleblowers also enjoy civil and criminal immunities from the consequences of their reports (Art 21). In addition, persons who obstruct or attempt to obstruct the reporting process are subject to sanctions (Art 23). Finally, whistleblowers should have access to legal, financial, and psychological support (Art 20).

These protections are available to whistleblowers provided they have reported under the conditions laid down in the Directive, i.e. if (a) they had reasonable grounds to believe that the information reported on the violations was true at the time of reporting and that this information fell within the scope of the Directive; and (b) they have made a report either internally in accordance with Article 7 or externally in accordance with Article 10, or have made a public disclosure in accordance with Article 15 (Art 6). Whistleblower protection hence only applies if subjective, material, and procedural conditions are met. A triple condition is also found in French law: the protection afforded to whistleblowers is conditional on the fact that the report relates to one of the matters provided for by the law[11] (material condition), is made without direct financial compensation and in good faith (subjective condition), and through one of the reporting channels – internal or external – provided for by the law (procedural condition). As long as these conditions are met, the whistleblower enjoys strong legal protection, hence the appeal of this status.

Does this protection also apply to scientists when reporting research misconduct? Two distinct, but possibly converging, elements stand in the way. First, on the procedural level, requiring, as many countries do, that research misconduct be reported through channels separate from those provided by whistleblower legislation has the unintended and unfortunate consequence of depriving those who report misconduct of the protection provided by that legislation. Indeed, the procedural requirement mentioned above would not be met in this case. This does not mean that scientists who report research misconduct receive no protection: the procedures for reporting research misconduct generally provide for guarantees of confidentiality and some protection to whistleblowers. But these

[11] Protected matters under French law are information relating to a crime, an offence, a threat or harm to the general interest, or a violation or an attempt to conceal a violation of an international commitment duly ratified or approved by France, of a unilateral act of an international organisation taken on the basis of such a commitment, of the law of the European Union, of the law, or of the regulations (Law no. 2016-1691 of 9 December 2016, Art 6).

protections are often vague and lack the precision and strength of those granted to whistleblowers. They may also differ from one university to another, creating a spatial inequality in the treatment of research misconduct. Secondly, in material terms, the fact that reports on research misconduct fall outside the scope of the Directive excludes them in principle from the protections it establishes. The material condition for the application of the Directive is therefore not fulfilled in the case of research misconduct either.

Faced with these difficulties, it is understandable that scientists may nevertheless try to place their reporting under whistleblowing legislation rather than under research misconduct in order to benefit from the associated protection. In France, an unanticipated consequence of the integration and definition of scientific integrity in the state legislation is that research misconduct can now be regarded as a violation of the law. It falls within the scope of whistleblower legislation and can hence be reported through the internal or external reporting channels set up under this legislation. Ultimately, this means that whistleblowing scientists who actually go through these channels may also benefit from legal protection against retaliation. Therefore, because of the appeal of whistleblower status and the protections afforded to them, scientists have a clear interest in reporting research misconduct through the whistleblowing channels (either the internal or, if available, the external channel) rather than through the specific research misconduct reporting procedures (again, internal or, if available, external) set up in research institutions.

The appeal of whistleblower status is further increased by the extent of the protections afforded to whistleblowers in the 2019 Directive. Indeed, it is recognised that the reprisals suffered by scientists who report research failures are not necessarily the same as those suffered by whistleblowers, and may take subtle forms such as loss of grants, lack of material or human resources for the laboratory, assignment to less interesting or less prestigious research projects, withdrawal of a collaboration agreement, lack of promotion, inability to find a position after the end of the postdoctoral contract, etc. (Chalk 1988, 21; HAS 1992, 120; Kevles 1998, 94; Lubalin and Matheson 1999, 235; Noiville and Hermitte 2006, 275). Yet the 2019 Directive broadens the range of prohibited reprisals against whistleblowers (Art 19). Some protections continue to be associated with employment, which is the core of whistleblower retaliation: (a) suspension, lay-off, dismissal; (b) demotion or withholding of promotion; (c) transfer of duties, change of location of place of work, reduction in wages, change in working hours; (d) withholding of training; (e) a negative performance assessment or employment reference; (f) imposition or administering of any disciplinary measure, reprimand or other penalty, including a financial penalty; (g) coercion, intimidation, harassment or ostracism; (h) discrimination, disadvantageous or unfair treatment; (i) failure to convert a temporary employment contract into a permanent one, where the worker had legitimate expectations that he or she would be offered permanent employment; (j) failure to renew, or early termination of, a temporary employment contract. But the Directive extends the protections afforded to whistleblowers beyond employment and includes (k) harm to the person's reputation, (l) blacklisting, (m) early termination or cancellation of a contract for goods or services; (n) cancellation of a licence or permit; (o) psychiatric or medical referrals. Moreover, the Directive adopts a broad conception of the beneficiaries of these protections who, apart from the whistleblowers themselves, are persons who have

facilitated[12] the whistleblowing, who are "connected with the reporting persons," or even "legal entities that the reporting persons own, work for or are otherwise connected with in a work-related context" (Art 4). Where a scientist blows the whistle, this extensive conception of the persons protected against retaliation, together with the wide range of protections granted, may thus cover colleagues, co-authors, a start-up created by a scientist, or a company that supplies scientific equipment or material for the laboratory.

Conclusion

Increasingly comprehensive legislation has been adopted in several countries to collect disclosures and protect whistleblowers. The development of whistleblowing legislation has accelerated in the European Union following the adoption of the Directive of 23 October 2019. At the same time, following a number of high-profile cases, universities and research institutes have put in place procedures for reporting and handling research misconduct. How these reporting procedures relate to each other varies from country to country, and a variety of legal frameworks persist within Europe, and even more so outside Europe (Resnik, Rasmussen, and Kissling 2015). This article argues that a more explicit and controlled articulation between the whistleblowing legislation and the rules governing the reporting and handling of research misconduct is needed. Beyond the European and French legal material considered, it also intends to draw out more general lessons and contribute to the discussion on the legal design of research misconduct reporting.

Within the European Union, the 23 October 2019 Directive allows for the coexistence of two parallel sets of legislation, one on whistleblowing and the other on research misconduct. A dual reporting scheme may seem appropriate, as the investigation of research misconduct, unlike violations of the law, necessitates a particular knowledge of scientific practice. It also responds to the scientific communities' repeatedly expressed preference for self-regulation. However, a major drawback is that it allows for differences in the protection afforded to whistleblowers depending on whether their actions fall within the context of whistleblowing legislation or research misconduct, with the protection afforded to the former being much better than that granted to the latter. Other unjustified differences also arise in the relevant procedures. The Directive of 23 October 2019 specified the procedures to be put in place for the collection and processing of alerts in general, and it would be problematic if this procedural framework did not also benefit reports of research misconduct. Conversely, the procedures put in place in research institutions for the collection of research misconduct, which are sometimes more precise than those provided for in the Directive, in some respects constitute possible guides for improving the handling of alerts.

With the broadened concept of whistleblowing resulting from the 2019 Directive, the attractiveness of the whistleblowing legal regime has been considerably strengthened, including for scientists who report research misconduct. The latter have a clear interest in being defined as whistleblowers under the Directive – although it is questionable whether they are always aware of this. Different situations may therefore arise. In a country such as France, which has adopted a broad definition of whistleblowing so as to include reports

[12] The Directive defines "facilitators" as "a natural person who assists a reporting person in the reporting process in a work-related context, and whose assistance should be confidential" (Art 5). French law takes an even broader view, by extending facilitator status to non-profit legal persons.

of violations of law and regulation and where, at the same time, scientific integrity has been given a legal basis, serious competition arises between the channels for reporting whistleblowing and research misconduct. Despite attempts by institutions (CNRS 2019, 32; RESINT 2018, 6) to keep these two channels separate, there is nothing to prevent a scientist from favouring a report via the channels provided for whistleblowing in order to benefit from the whistleblower protection regime. The result is a situation of confusion, where the coexistence of the two channels is difficult to maintain over time. The situation is no better in countries where the reporting channel in line with the Directive is clearly distinct from the reporting channel specific to research misconduct. Indeed, in this case there is no reason why research misconduct reports should be associated with less protection than that granted to whistleblowers by the Directive. Neither of these situations is satisfactory, and two possible ways forward are thus apparent. Either research whistleblowers are simply integrated into ordinary whistleblowing law, or research misconduct reporting is given procedural guarantees and protections equivalent to those provided for ordinary whistleblowers. Either way, these findings pave the way for a more refined articulation of whistleblowing law and research misconduct.

References

Abazi, Vigjilenca. 2020. "The European Union Whistleblower Directive: A 'Game Changer' for Whistleblowing Protection?" *Industrial Law Journal* 49 (4): 640–656.

Abazi, Vigjilenca. 2021. "Whistleblowing in the European Union." *Common Market Law Review* 58 (3): 813–850.

All European Academies [ALLEA]. 2003. *Memorandum on Scientific Integrity. On standards for scientific research and a National Committee for Scientific Integrity (NCSI)*. Amsterdam: ALLEA.

All European Academies [ALLEA]. 2011 [revised 2017]. *The European Code of Conduct for Research Integrity*. Berlin: ALLEA.

American Association for the Advancement of Science [AAAS]. 1990. *Resolution on Federal legislation providing immunity for investigations and reporting of scientific fraud and misconduct. Apr 27, 1990*. Washington: AAAS.

Apaza, Carmen R., and Yongjin Chang, eds. 2017. *Whistleblowing in the World: Government Policy, Mass Media and the Law*. Cham: Palgrave Macmillan.

Aubert Bonn, Noémie, and Wim Pinxten. 2019. "A Decade of Empirical Research on Research Integrity: What Have We (Not) Looked At?" *Journal of Empirical Research on Human Research Ethics* 14 (4): 338–352. doi: 10.1177/1556264619858534

Bourdieu, Pierre. 1984. *Homo Academicus*. Paris: Les Editions de Minuit.

Broad, William, and Nicholas Wade. 1982. *Betrayers of Truth.* New York: Simon and Schuster.

Brown, A.J., David Lewis, Richard Moberly, and Wim Vandekerckhove. 2014. *International Handbook on Whistleblowing Research.* Cheltenham: Edward Elgar.

Centre National de la Recherche Scientifique [CNRS]. 2019. "Intégrité scientifique au CNRS. Modalités d'action." *Bulletin officiel du CNRS*, Feb 2019: 30–34.

Centre National de la Recherche Scientifique [CNRS]. 2023. *Rapport d'auto-évaluation 2017–2021*. Paris: CNRS.

Chalk, Rosemary. 1988. “Workshop summary.” In: *AAAS-ABA National Conference of Lawyers and Scientists. Project of Scientific Fraud and Misconduct. Report on Workshop Number One*. Washington: AAAS, 1–33.

Corvol, Pierre. 2016. *Bilan et propositions de mise en oeuvre de la charte nationale d’intégrité scientifique*. Report.

Department of Health and Human Services [DHHS]. 1986. “Policies and Procedures for Dealing with Possible Misconduct in Science.” *NIH Guide* 15 (11): 1–37. Washington: Public Health Service.

Department of Health and Human Services [DHHS]. 1989. “Responsibilities of Awardee and Applicant Institutions for Dealing With and Reporting Possible Misconduct in Science – 42 CFR Part 50.” *Federal Register* 54 (151): 32446–32451.

Department of Health and Human Services [DHHS]. 2000. “Public Health Service Standards for the Protection of Research Misconduct Whistleblowers.” *Federal Register* 65 (229): 70830–70841.

Department of Health and Human Services [DHHS]. 2005. “Public Health Service Policies on Research Misconduct; Final Rule - 42 CFR Parts 50 and 93.” *Federal Register* 70 (94): 28370–28400.

Deutsche Forschungsgemeinschaft [DFG], Commission on Professional Self Regulation in Science. 1997. *Proposals for Safeguarding Good Scientific Practice*. Bonn: DFG.

Deutsche Forschungsgemeinschaft [DFG]. 2019. *Guidelines for Safeguarding Good Research Practice. Code of Conduct*. Bonn: DFG.

Devine, Tom, and Alicia Reaves. 2016. “Whistleblowing and Research Integrity: Making a Difference Through Scientific Freedom.” In *Handbook of Academic Integrity*, edited by Tracey Bretag, 957–972. Singapore: Springer. doi: 10.1007/978-981-287-098-8_31

Dougherty, M.V. 2018. *Correcting the Scholarly Record for Research Integrity*. Cham: Springer.

Dugan, Caley D., Lisa M. Lee, and Cristen B. Jandreau. 2023. “Timing and monitoring of financial disclosures in publications: A cross-institutional assessment of financial conflict of interest reports.” *Accountability in Research* doi: 10.1080/08989621.2023.2172569.

Edsall, John T. 1981. “Two Aspects of Scientific Responsibility.” *Science* 212 (4490): 11–14.

Else, Holly. 2023. “Alzheimer’s drug saga prompts journal to scrutinize whistle-blowers.” *Nature* 613: 618–619.

European Network of Research Integrity Offices [ENRIO]. 2019. *Recommendations for the Investigation of Research Misconduct*. Vienna: ENRIO.

Erwin, Edward, Sidney Gendin, and Lowell Kleiman, ed. 1994. *Ethical Issues in Scientific Research*. New York: Garland Publishing.

European Science Foundation (ESF). 2010. *Fostering Research Integrity in Europe*. Strasbourg: ESF.

European Science Foundation (ESF) / All European Academies (ALLEA). 2011. *The European Code of Conduct for Research Integrity*. Strasbourg: ESF/ALLEA.

Fasterling, Björn. 2014. “Whistleblower protection: A comparative law perspective.” In: *International Handbook on Whistleblowing Research*, edited by A.J. Brown, David Lewis, Richard Moberly, and Wim Vandekerckhove, 331–348. Cheltenham: Edward Elgar.

Freckelton, Ian. 2020. “Research Misconduct.” In: *Handbook of Research Ethics and Scientific Integrity*, edited by Ron Iphofen, 159–180. Cham: Springer.

Friedman, Paul J. 1993. “Background and Advice to Faculty Serving on Ad Hoc Committees of Inquiry Concerning Questions of Research Integrity.” *Academic Medicine* 68 (9): s100–s102.

Goldman Herman, Karen, Philip L. Sunshine, Montgomery K. Fisher, James J. Zwolenik, and Charles H. Herz. 1994. “Investigating Misconduct in Science: The National Science Foundation Model.” *The Journal of Higher Education* 65 (3): 384–400.

Guston, David. 2000. *Between Politics and Science: Assuring the Integrity and Productivity of Research*. Cambridge: Cambridge University Press.

Institut national de la santé et de la recherche médicale [INSERM]. 1998. “Recommandations du groupe de travail de la Mission de réflexion sur l’intégrité scientifique.” *INSERM Actualités* 162: 1–4.

Jackson, C. Ian, and John W. Prado. 1983. “Possible roles for Sigma Xi in regard to scientific fraud, irresponsible authorship, and ‘publish or perish’.” *American Scientist* 71 (5): 462–464.

Joerges, Bernward, and Terry Shinn, ed. 2001. *Instrumentation Between Science, State and Industry*. Dordrecht: Kluwer Academic Publishers.

Kevles, Daniel J. 1998. *The Baltimore Case. A Trial of Politics, Science, and Character*. New York: Norton & Cie.

Kleinman, Daniel Lee, and Steven P. Vallas. 2001. “Science, capitalism, and the rise of the ‘knowledge worker’: The changing structure of knowledge production in the United States.” *Theory and Society* 30 (4): 451–492.

Kohn, Stephen M. 2007. *Federal Whistleblower Laws and Regulation*. Washington: National Whistleblower Center.

Korenman, Stanley G. 1993. “Conflicts of Interest and Commercialization of Research.” *Academic Medicine* 68 (9): s18–s22. doi: 10.1097/00001888-199309000-00029.

Krimsky, Sheldon. 2005. “The Funding Effect in Science and its Implication for the Judiciary.” *Journal of Law & Policy* 13 (1): 43–65.

LaFollette, Marcel C. 1992. *Stealing into Print. Fraud, Plagiarism, and Research Misconduct in Scientific Publishing*. Berkeley: University of California Press.

LaFollette, Marcel C. 1994a. “The pathology of research fraud: the history and politics of the US experience.” *Journal of Internal Medicine*. 235: 129–135.

LaFollette, Marcel C. 1994b. “The Politics of Research Misconduct: Congressional Oversight, Universities, and Science.” *Journal of Higher Education*. 65 (3): 261–285.

Leclerc, Olivier. 2017. *Protéger les lanceurs d’alerte. La démocratie technique à l’épreuve de la loi*. Paris: LGDJ.

Leclerc, Olivier. 2022. “L’enquête consecutive à une alerte.” *Droit ouvrier* 883: 110–122.

Leclerc, Olivier. 2023. “Overarmed or underdressed? whistleblowers between anti-discrimination law and freedom of expression.” *International Journal of Discrimination and the Law* 23 (1). doi: 10.1177/13582291231154161

Lewis, David. 2022. “Stigma and Whistleblowing: Should Punitive Damages be Available in Retaliation Cases?” *Industrial Law Journal* 51 (1): 62–83.

Lubalin, James S. and Jennifer L. Matheson. 1999. “The Fallout: What Happens to Whistleblowers and Those Accused but Exonerated of Scientific Misconduct?” *Science and Engineering Ethics* 5 (2): 229–250.

Medical Research Council [MRC]. 1997. *Policy and Procedure for Inquiring into Allegations of Scientific Misconduct*. London: MRC.

Melander, Hans, Jane Ahlqvist-Rastad, Gertie Meijer, and Björn Beermann. 2003. “Evidence b(i)ased medicine—selective reporting from studies sponsored by pharmaceutical industry: review of studies in new drug applications.” *BJM* 326 (31 May): 1–5.

Mishkin, Barbara. 1988. “Due Process in Dealing with Scientific Misconduct.” In: *AAAS-ABA National Conference of Lawyers and Scientists. Project of Scientific Fraud and Misconduct. Report on Workshop Number One*. Washington: AAAS, 117–129.

Mraouahi, Sabrina. 2022. “Sur le regime des enquêtes internes en droit du travail: essai de synthèse.” *Droit ouvrier* 883: 89–99.

NAS (National Academy of Science, National Academy of Engineering, Institute of Medicine). 1992. *Responsible Science. Ensuring the Integrity of the Research Process*. Vol. 1. Washington: National Academy Press.

NSF (National Science Foundation). 1987. “Misconduct in Science and Engineering Research: Final Regulations.” *Federal Register* 52: 24466–24470.

NSF (National Science Foundation). 2002. “Research Misconduct - 45 CFR Part 689.” *Federal Register* 67 (52): 11936–11939.

Netherlands Organisation for Scientific Research [NWO], Royal Netherlands Academy of Arts and Science [KNAW], Association of Universities in the Netherlands [VSNU]. 2001. *Memorandum on Scientific Integrity. On standards for scientific research and a National Committee for Scientific Integrity (NCSI)*. The Hague: NWO.

Netherlands Organisation for Scientific Research [NWO]. 2018. *Netherlands Code of Conduct for Research Integrity*. The Hague: NWO.

Netherlands Organisation for Scientific Research [NWO]. 2019. NWO Scientific Integrity Complaints Procedure. The Hague: NWO.

Noiville, Christine, and Marie-Angèle Hermitte. 2006. “Quelques pistes pour un statut juridique du chercheur lanceur d’alerte.” *Natures Sciences Sociétés* 14 (3): 269–277.

Nylenna, Magne, Daniel Andersen, Gisela Dahlquist, Matti Sarvas, and Asbjørn Aakvaag. 1999. “Handling of scientific dishonesty in the Nordic countries.” *The Lancet* 354, July 3: 57–61.

Organisation for Economic Co-Operation and Development [OECD], Global Science Forum. 2007. *Best Practices for Ensuring Scientific Integrity and Preventing Misconduct*. Paris: OECD.

Organisation for Economic Co-Operation and Development [OECD], Global Science Forum. 2009. *Co-ordinating Committee for Facilitating International Research Misconduct Investigations. Final Report*. Paris: OECD.

Office of Research Integrity [ORI]. 1995. *ORI Guidelines for Institutions and Whistleblowers: Responding to Possible Retaliation Against Whistleblowers in Extramural Research*. Rockville: ORI.

Office of Science and Technology policy [OSTP], Executive Office of the President. 2000. *Federal Policy on Research Misconduct*. *Federal Register* 65 (235): 76260–76264.

Parrish, Debra M. 1997. "Reducing the Likelyhood of Litigation Stemming from Scientific Misconduct Allegations." In: *Scientific Misconduct: Protecting Institutions, Faculty and Others from Liability. Science and Technology Section 1997 Annual Meeting*. San Francisco: American Bar Association.

Perzan, Christopher P. 1992. "Research and relators: the false claims act and scientific misconduct." *Washington University Law Quarterly* 70 (2): 639–664.

Price, Alan R. 1998. "Anonymity and Pseudonymity in Whistleblowing to the U.S. Office of Research Integrity." *Academic Medicine* 73 (5): 467–472.

Price, Alan R. 2013. "Research Misconduct and Its Federal Regulation: The Origin and History of the Office of Research Integrity—With Personal Views by ORI's Former Associate Director for Investigative Oversight." *Accountability in Research* 20 (5–6): 291–319. doi: 10.1080/08989621.2013.822238

Reitz, Megan, and John Higgins. 2022. "Relevance and Challenges of Whistleblowing in the UK's National Health System." In: *Integrity of Scientific Research. Fraud, Misconduct and Fake News in the Academic, Medical and Social Environment*, edited by Joel Faintuch and Salomão Faintuch, 533–540. Cham: Springer. doi: 10.1007/978-3-030-99680-2_53

Réseau des référents à l'intégrité scientifique [RESINT]. 2018. *Guide pour le recueil et le traitement des signalements relatifs à l'intégrité scientifique*. Paris: RESINT.

Réseau des référents à l'intégrité scientifique [RESINT]. 2023. *Traitement des signalements relatifs à l'intégrité scientifique: manuel de procédures*. Paris: RESINT.

Resnik, David. 1998a. *The Ethics of Science. An Introduction*. London: Routledge.

Resnik, David. 1998b. "Conflicts of Interest in Science." *Perspectives of Science* 6 (4): 381–408.

Resnik, David, Lisa M. Rasmussen, and Grace E. Kissling. 2015. "An International Study of Research Misconduct Policy." *Accountability in Research* 22 (5): 249–266.

Shamoo, Adil E., and David B. Resnik. 2022. *Responsible Conduct of Research*. 4th ed. Oxford: Oxford University Press.

Sieber, Joan E. 1999. "Why Fallout from Whistleblowing is Hard to Avoid." *Science and Engineering Ethics* 5 (2): 255–260.

Sismondo, Sergio. 2008. "Pharmaceutical company funding and its consequences: A qualitative systematic review." *Contemporary Clinical Trials* 29 (2): 109–113.

Steneck, Nicholas H. 1994. "Research Universities and Scientific Misconduct: History, Policies, and the Future." *Journal of Higher Education.* 65 (3): 310–330.

Steneck, Nicholas H. 1999. “Confronting Misconduct in Science in the 1980s and the 1990s: What has and has not been accomplished?” *Science and Engineering Ethics*. 5 (2): 161–176.

Swazey, Judith P., and Stephen R. Scher. 1981. *Whistleblowing in Biomedical Research. Policies and Procedures for Responding to Reports of Misconduct*. United States. President’s Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, American Association for the Advancement of Science, Medicine in the Public Interest.

Thüsing, Georg, and Gerrit Forst, ed. 2016. *Whistleblowing – A Comparative Study*. Cham: Springer.

Van Portfliet, Megahn. 2022. “Resistance Will Be Futile? The Stigmatization (or Not) of Whistleblowers.” *Journal of Business Ethics* 175 (3): 451–464.

Van Waeyenberge, Arnaud, and Zachariah Davies. 2021. “The Whistleblower Protection Directive (2019/1937): A Satisfactory but Incomplete System.” *European Journal of Risk Regulation* 12 (1): 236–244.

Vaughn, Robert G. 1989. “Whistleblowing in academic research.” In: *AAAS-ABA National Conference of Lawyers and Scientists. Project of Scientific Fraud and Misconduct. Report on Workshop Number Two*. Washington: AAAS, 95–130.

Vaughn, Robert G. 2012. *The Successes and Failures of Whistleblower Laws*. Cheltenham: Edward Elgar.

Willcox, Breckinridge L. 1993. “Fraud in Scientific Research: The Prosecutor’s Approach.” *Accountability in Research* 2 (2): 139–151.

World Conference on Research Integrity [WCRI]. 2010. *Singapore Statement on Research Integrity*. Singapore: WCRI.