Responsible VIB Research

The importance of doing research in the correct way

VIB

Training responsible scientists and performing research in the most responsible manner are two important objectives of VIB. We have a policy to promote safety, bioethics and integrity in research.

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Responsible VIB Research

VIB was established to make substantial contributions to the advancement of scientific knowledge and to translate these insights into added value for society. As a consequence we attach great importance to pushing scientific boundaries and the pressure to perform can be high. Nevertheless, that pressure should never lead to insufficient attention for the way in which we conduct our research. Compliance with legislation is a must and work needs to be done in a safe way. We also need to deal with ethical questions seriously and we see to it that high integrity standards are upheld. In summary; research should be performed in a correct and responsible manner.

For VIB 'Responsible Research' encompasses the following key concepts:

- Doing research in a safe manner
- Legal compliance
- Dealing with bioethical issues responsibly
- Applying high integrity standards
- Accountability
- Awareness about and sensitivity to societal issues

This brochure provides information in relation to all of these key concepts. It's important for all of us that we understand their importance and integrate them into our daily research work in an appropriate manner.

Doing research in a safe manner

Life sciences research involves working with all kinds of materials that could cause risks to our health and/or our environment. Some examples:

- Hazardous chemicals
- Pathogens and GMOs with hazardous properties
- Ionizing radiation
- Cryogenic fluids
- Sources of heat
- UV light and lasers
- Sharps
- Machines, tools, equipment and installations

We can prevent injuries and incidents, protect the environment and also the unborn child by being attentive and respecting appropriate safety measures and protocols.

Your colleagues count on your responsible behavior just like you count on theirs

Practical information about the different aspects of safety related to working in our laboratories can be found in the following places:

- In the VIB brochure Safety@Work that has been provided to you and which is available on the VIB intranet under 'Responsible VIB Research' / 'Biosafety & environment'. In this same section on the intranet you can also find information of how to deal with spills, on motherhood protection, the choice and use of disposable gloves and much more.
- On the intranet pages of your department that provide information on specific local safety procedures, such as local waste handling procedures and much more.
- On the webpages of the safety department of your university.

Be sure to check these sources, absorb the information, and act accordingly.

Legal compliance

Many activities in our laboratories are subject to legislation and may require permits, accreditations or notifications. Activities

Always report the intention to start new high-impact activities to the safety coordinator

with pathogens, GMOs, certain chemicals, radioactive substances, and laboratory animals are important examples and normally they require a general exploitation permit in which different items and activities have to be incorporated.

We have to be sure to have appropriate up-to-date authorizations at all times and therefore it is important that you inform the safety coordinator when you start new activities that may require updating these authorizations. Contact the safety coordinator when you have the intention to start activities that involve for instance:

- New organisms, or other new biological materials, not used before in the lab
- Important new technologies and/or valuable equipment

Permit conditions

We need to comply with general legislative requirements and often permits, authorizations or accreditations impose specific conditions that need to be met. The permits we need for field trials with GMOs e.g. impose specific requirements for notifications and monitoring, etc. If your activity requires a specific permit or authorization, you should be familiar with the conditions that apply-to performing this type of work and in case you have questions don't hesitate to ask the safety coordinator.

The list of central and local safety coordinators is available on the VIB intranet under 'Responsible VIB Research'. The environmental & health services of the university maintain up-to-date databases of permitted activities. You can also contact safety@vib.be to obtain specific information on what is currently authorized to do and what not.

Dealing with ethical questions responsibly

At VIB we work with materials and organisms that need our specific attention from an ethical point of view. In particular for the use of human bodily materials and animals or when we involve humans as test persons in our research.

Ethics: Where human behavior touches our norms and values

Human bodily materials

For the procurement and use of primary human materials in research such as blood or tissue samples, the following principles should be respected:

- **Free donation** - voluntary and unpaid donation of the material
- **Informed consent** by the donor
- **Protection of privacy** of the donor

These principles prescribe that potential donors need to be informed correctly about the goal of the use of the material and any benefits and risks attached to the donation by means of an information leaflet. Often there are no additional risks attached to the donation as in many cases the material is taken away anyhow as part of a diagnostic or therapeutic intervention. But of course any invasive procedure to obtain materials entails some small risks for the donor. The donor should also always have the possibility to ask questions. The goal of the research can either be described in a very general way or more specifically. If you describe it in a more general way you will have some larger freedom to use the materials in your research. The consent needs to be recorded by having the donor sign an informed consent form.

In Belgium residual materials – that is, left-overs from diagnostic or therapeutic interventions – can be used in research unless the donor objects to it, but in practice also for these materials often an informed consent form is used.

Privacy is generally protected by coding the material in such a way that the researcher cannot link the material or any other information to an individual. An even more rigorous way of working is by anonymizing the material. The coding or anonymizing is generally done by physi

cians or biobanks that collect the material and who share this material for use in research. For the coding itself a number of principles apply in terms of separating data on different hardware and making sure that only specific authorized persons are able to crack the code and link a coded sample to a specific donor.

Inform donors correctly and make sure to have an approval to use the material from an ethical review board

Research projects involving primary human materials also need to be approved by an **ethical review board**. In general there is an exception for this requirement for the use of certain primary cells like HUVEC cells when they stem from commercial sources. At VIB we make use of the local ethical review boards of the university and/or university hospital. They all have their own websites with practical information and forms that you can consult at the moment you wish to get an approval for using human primary materials in research.

The use of animals in research

The use of animals in research is a sensitive issue. Unfortunately, the use of animals is still unavoidable in order to achieve the necessary breakthroughs in biomedical research. There are steps that can and should be performed *in vitro* which form a good alternative for certain parts of animal research.

You are not allowed to be involved in animal care and experimentation if you have not concluded the appropriate animal welfare trainings according to FELASA standards. An overview of the available trainings in Belgium can be found on the BCLAS.org website under 'basic formation / training sessions'. Animal experiments themselves can only be started if you have the approval of an animal ethics review board. VIB makes use of the local animal ethics review boards of the university. You need to provide a good scientific rationale and a detailed description of the procedures that you wish to perform on the animals and how any potential suffering will be minimized. You also need to provide statistical evidence that the number of animals and sizes of groups are neither smaller nor bigger than the number you need to get a scientifically correct outcome. You should also provide information to substantiate that the animal experiment has not been done before. If you need help with this you can consult colleagues that already have more experience with this or consult the Regulatory & Responsible Research manager at safety@vib.be.

Implement the Three R's conscientiously when you set up animal experiments

You have to strictly apply the "Three R's" principle – Replacement, Reduction and Refinement of animal experimentation – and this is achieved by carefully considering any experiment and designing it on the basis of the information described above.

More information and forms can also be requested from your local animal ethics review board.

The use of humans in research

VIB research is generally limited to basic and preclinical research, but it could occur that you become involved in a translational project that in the end may lead to the use of human subjects in clinical trials. In general the same principles apply as for the use of human bodily materials in research, namely voluntary participation, informedconsent and protection of privacy. Participants should understand all possible risks of participating in a trial. In terms of preparation and setup, clinical trials are a very complicated type of research that need meticulous preparation and cannot be performed without the appropriate approvals by the local ethical review board of the university and/or the university hospital.

Applying high integrity standards

VIB attaches great importance to high quality, ethical scientific research. To facilitate this, VIB has developed a number of guidelines and procedures. VIB also has a Research Integrity Officer who is available for questions, complaints and mediation in matters concerning integrity.

Scientific integrity can be described as professional behavior in the execution of scientific research while adhering to the principles of honesty, accuracy, efficiency, and objectivity. Violating the principles of scientific integrity is not taken lightly. It may have consequences and depending on the nature and extent of such violations, it may even lead to the termination of employment.

VIB forms a joint venture structure with the universities. Like VIB, the universities also have their policies and structures to promote integrity and deal with alleged cases of research misconduct. For more information about this, please visit the web pages or intranet of your university and search for 'scientific integrity'.

VIB definition of research misconduct

Research misconduct means fabrication of data, falsification (e.g. through the undisclosed selection and suppression of unwanted results or through the manipulation of a representation or illustration), plagiarism, or other practices that seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting, or reporting research. It does not include honest error or honest differences in interpretations or judgments of data.

VIB policies and procedures concerning research misconduct

The VIB definition of research misconduct does not only focus on the 'hard-core' fabrication, falsification and plagiarism. It also includes intentionally, knowingly or recklessly applying practices that seriously deviate from those that are commonly accepted within the scientific community.

Reporting of alleged cases of research misconduct

VIB employees have an obligation to report research misconduct. In order to be admissible, a notification must be specific and substantiated. The identity of the person submitting the notification needs to be known to the Research Integrity Officer, but can remain confidential for all other parties involved in the investigation. Both the notifier and the person alleged of having committed research misconduct have rights that are carefully protected. This is why the procedure guarantees strict confidentiality. Any investigation will be done thorough and fair.

Strict confidentiality is applied, in order to fully protect the rights of all people involved

VIB or university primacy

When an alleged case of scientific misconduct is reported to VIB, the Research Integrity Officer will always inform the university and agree on who will take the lead in handling the case. Whether the person alleged of having committed

research misconduct is on the payroll of VIB or the university will play an important role in determining who will handle the case. But anyhow, there will always

Everybody is innocent until proven otherwise

be a good coordination and information exchange between VIB and the university.

Investigation

For the investigation a stepwise approach is used which may include sequestration of research data, hearing relevant witnesses and the persons involved, and consultation of scientific experts. More information on the procedure can be found on the VIB intranet under 'Responsible VIB Research' / 'scientific misconduct'.

For further information or notifications, contact:

VIB Research Integrity Officer
René Custers
integrity@vib.be
+32 (0)9 244 66 11
+32 (0)474 52 13 40

How to avoid incorrect science

Scientists who want to pursue an academic career experience pressure to perform, as the number, quality and impact of their publications play an important role in achieving that goal. This pressure to perform and the stress resulting from it are often mentioned as a cause for violations of scientific integrity. Stress, however, is not due to publication pressure by or in itself. Other factors, such as personal ambition and the way the research is being managed, also play a role.

Pressure to perform can never be an excuse for violating scientific integrity

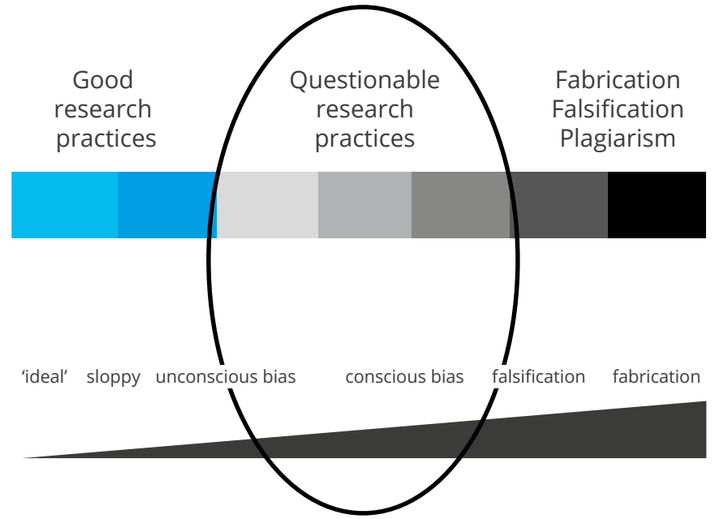
The best way to deal with pressure is to stay focused on the content and quality of the work. Proper coaching is also very important and VIB assists you by providing a coaching program. Cutting corners in order to get your manuscript out may relieve some pressure but is not likely to take away all your stress, and certainly won't make you happier in the long run.

The grey area of questionable research practices

There is a continuum from truly correct to truly deceptive scientific research. The grey area in between is often referred to as 'Questionable Research Practices' (QRP). Intentionally, knowingly or recklessly applying QRP is also regarded as research misconduct. Examples of QRP are neglecting negative outcomes, using inappropriate statistics to support one's hypothesis, leaving out relevant controls, conscious bias such as cherry picking of results, etc.

What you can do to prevent unintentional QRP

Much, if not all, unintentional QRP can be prevented by applying high quality standards and a very critical mindset. Designing proper scientific experiments can be learned, and the same holds true for ensuring the quality of their execution. VIB offers courses on smart research design and correct statistics as part of its 'training at VIB' program (see www.vib.be/training). VIB also provides guidance on correct scientific image manipulation[1]. The processing and manipulation of scientific images should never result in a misrepresentation of the original data. For more information see the VIB web and intranet pages under 'Responsible VIB Research'/ 'Image manipulations'.



Two ways of representing good to bad science - adapted from Daniele Fanelli.

[1] **VIB guidelines on acceptable scientific image manipulation**

When we take decisions in the setup of experiments or the analysis of their outcomes, the choices are definitely not all black and white. What is the actual appropriate statistical method for analyzing the data? Which controls – positive and negative – should be included?

Upgrade your knowledge and skills and critically discuss in group

What about outliers? Do they reflect a chance event that can be ignored and can be considered a statistical anomaly? Or does the outlier tell us something relevant about the topic of the study and removing it will skew the conclusion? These are all issues that should be thoroughly discussed beforehand, preferably in a group. The more critical minds look at it, the better.

Be aware of your own bias as well. We all have certain hopes or expectations for the outcome of a scientific experiment. It is very easy to ignore signals that may be telling us that the 'truth' is somewhat different from what we were expecting. Always step outside the box of your own thinking and look at your data from different angles.

Authorship

Authorship is an explicit way of assigning responsibility and giving credit for intellectual work. It is important for your reputation as a researcher, your academic promotion and grant support but it also contributes to the strength and reputation of VIB as an institution. In support of honest authorship practices, VIB has developed institutional authorship guidelines the full version of which is available on the VIB intranet under 'Responsible VIB Research' / 'Authorship'

VIB promotes honest assignment of authorship as a tool to help build solid and correct scientific careers

Make sure to apply honest authorship practices. In case of discussions or conflicts about authorship, try to resolve them internally and with the authors as a group. In case you have tried hard but are not able to resolve the conflict, you can contact the VIB Research Integrity Officer at integrity@vib.be for mediation.

Conflicts of interest

Conflicts of interest can inappropriately affect research. A conflict of interest is a situation where a person is trusted to act impartially, yet the person has personal interests that could influence or 'bias' professional judgments or actions. It is recognized that true objectivity is very difficult, if not impossible to achieve, because everybody's judgments and actions are colored and driven by the institutional and personal context in which they operate. Also nobody is without interest. Finding yourself in a conflict of interest does in itself not constitute incorrect behavior and conflicts of interest are sometimes difficult to avoid. It is how one handles the situation that will determine whether or not one has acted correctly. There may be personal or institutional considerations that may affect your behavior, resulting in behavior that is not completely honest.

If possible, try to avoid conflicts of interest. And in any case declare any interests so they can be addressed. Transparency is the most important value. VIB has specific policies to comply with the financial conflicts of interest policies of the National Institutes of Health (NIH) which apply to those who want to receive NIH funding. Also, a specific policy has been formulated for handling possible financial conflicts of interest and conflicts of commitment for those who will play an active role in setting up or the further existence of new VIB start-ups. The VIB conflict of interest policy is available on the VIB intranet under 'Responsible VIB Research' / 'Conflicts of Interest'.

Try to avoid true conflicts of interest and always declare your interests so they can be appropriately addressed

Accountability

Accountability is part of good governance. For VIB ethical accountability is important and means that we should be able to account for the way that we do our research and that we are conscious and take responsibility for the possible impact of our research. In terms of accounting for the way that we do research we need to be able to show that we perform our research in a responsible manner – safe, honest and ethically correct – , but also that the science that we produce is correct. For this experiments need to be fully traceable and data need to be logged in a detailed manner and stored safely for a period of at least 5 years.

We need to be able to show that the science we produce is correct. Data traceability and proper storage of data are a must.

Be aware of and responsive to societal issues

Life sciences research encompasses a broad range of activities. Not all of them are that well known to the general public. Some areas or activities may even be slightly controversial. It is important that you are aware of the societal context of the type of research that you are performing.

If you have the possibility to speak to a broader audience about the type of research that you are doing, please do so. Try to speak in a language that your audience can easily understand. Gather the different arguments to account for the research that you are doing. Don't stick to one-sided information but also ask questions to your audience to get some feedback. This will provide more understanding of what type of questions they have or what their concerns are, if any.

Do not perform your research in an ivory tower

The more your research activities are unknown to or controversial for certain parts of the public, the more important it is to be transparent and responsive. The best way of showing responsiveness is to do your research in a very responsible manner, avoiding incidents that might fuel any controversy. Areas that are more sensitive are for instance the development and use of genetically modified crops, the use of animals for scientific experimentation, the use of embryonic stem cells, the protection of privacy of people that have donated bodily materials for research, or synthetic biology. Make sure you always have a correct motivation to use such materials or perform such activities.

Conclusion

We attach great importance to responsible behavior in the execution of our scientific research. This brochure provides information on issues of safety, integrity and ethics in research and guidance on where to find further practical information. This information could be helpful to make responsible behavior your second nature.

Useful information

VIB headquarters health, safety & environment
René Custers, Regulatory & Responsible Research Manager
Kurt Van Beneden, Prevention Officer
Tel: 09 244 6611
e-mail: safety@vib.be

Local safety coordinators
See VIB intranet, 'Responsible VIB Research' / 'Biosafety & environment'

Research Integrity Officer
René Custers
Tel: 09 244 6611
e-mail: integrity@vib.be

All VIB guidelines and documents pertaining to health & safety, motherhood protection, bio-ethics, integrity, authorship, image manipulations, conflicts of interest, etc. are available on the VIB intranet (https://intranet.vib.be) under the heading 'Responsible VIB Research'.

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