UNIT FOR RESPONSIBLE CONDUCT IN RESEARCH (URCR)

GUIDANCE ON AUTHORSHIP PLANNING

The principles and practices underlying i3S research culture and policy served as the basis of the I3S Authorship Guidelines. At i3S all researchers (including early-career and senior ones) are given the opportunity (and are strongly advised) to have training in Responsible Conduct in Research. The present document was issued by the Unit for Responsible Conduct in Research (URCR) has a guiding tool that can be used to plan Authorship and prevent potential conflicts.

INTRODUCTION

Research is a dynamic process and changes in authorship, may occur as a project or manuscript progresses:

- **Authors may be added**
  Some of the reasons why authors might be added to a manuscript include:
  (a) the project has expanded beyond the original purpose, conceptualization, or scope;
  (b) the added author may possess valuable expertise necessary for the completion of the project, to improve the overall scientific quality of the manuscript or to address major concerns expressed by a reviewer of the submitted manuscript;
  (c) a contributor to the project who originally was intended to be thanked in the acknowledgement section of the manuscript became significantly more involved to the extent that their contributions warranted authorship.

- **Authors may be removed**
  Some of the reasons why authors may be later omitted from authorship include:
  (a) the author did not contribute to the project as originally expected or agreed upon;
  (b) the author graduated or relocated before a project could be significantly undertaken, and the author's relocation prevented her or him from reasonably or substantially contributing to the proposed project.

- **The authorship order may be revised**
  Some of the reasons why authorship order may be revised include:

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(a) the actual contributions of authors differed significantly from the originally expected contributions at the beginning of the project;
(b) an author would like to accept increased responsibility, or would like to delegate a portion of her or his responsibility to other authors.

Discussing authorship at regular intervals as a result of major developments in the project can help minimize the potential for disagreements later on in the project. Open communication among all project members is one of the requirements to build an ethical environment.

Misunderstandings or authorship disputes may occur throughout a project. When they happen, those who have contributed to the project should first discuss the disagreements within the project team in an open and professional manner. Some collaborators may be unaware of the actual involvement of other members of the research team, especially when projects are being conducted at multiple institutions or are longitudinal.

In case any author has questions on Responsible Conduct in Research, or is experiencing conflicts regarding Authorship that cannot be solved and there is evidence of misconduct, the Unit for Responsible Conduct in Research, headed by Susana Magalhães (Room115, S2, Phone: +351 22 557 0702, Ext. 7150); e-mail: susana.magalhaes@i3s.up.pt) can be contacted. **If any i3S collaborator is willing to get advice on a case of alleged research misconduct or questionable practice, please see the Procedures for Reporting Cases of Misconduct, as well as the Allegation of Research Misconduct Proforma.**

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1. i3S Authorship Guidelines: clarifying concepts

i3S Authorship Guidelines:

1. In agreement with the ICMJE and CSE guidelines, an "author" is an individual who has made a significant intellectual contribution to the study and who agrees to be accountable for this contribution.

2. All authors should have made substantial contributions to all of the following criteria:

a) the conception or design of the study; or the acquisition, analysis or interpretation of data; AND

b) drafting the article or revising it critically for important intellectual content;

c) approval of the final manuscript.

According to ICMJE recommendations last version, a fourth criterion has been added:

*d**)** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.*

What does "substantial contribution" mean?

According to Good Publication Practice for Communicating Company-Sponsored Medical Research: GPP3,

"A substantial contribution is an important intellectual contribution, rather than technical assistance[1], without which the work, or an important part of the work, could not have been completed or the manuscript could not have been written and submitted for publication" (19).

"Simply collecting data (e.g., enrolling many patients) would not necessarily be considered a qualifying criterion for authorship. Some examples of what might represent a substantial intellectual contribution include **actively guiding the**

[1] The i3S Scientific Platforms are in the forefront of technology to promote and sustain high standard scientific research and development. Experienced and accomplished specialists coordinate and manage these Scientific Platforms, who are available to provide personalized guidance and help in the processes of experimental design and implementation. **The work performed by these platforms must be always acknowledged and, in some cases, authorship can be warranted if there is an initial agreement on more collaboration by their specialists.**

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scientific content of the publication or presentation, statistical analysis and interpretation, crafting of the discussion, and developing the protocol."

What does "Drafting the article or revising it critically for important intellectual content" mean?

"This criterion refers to **revisions beyond minor corrections for grammar, language, formatting, or layout.** The key is **sustained intellectual contribution, the provision of substantial comments, and approval of the final version**. Although preferred, it is not always feasible or necessary for authors to comment on every stage of manuscript development."

What does "final approval of the version to be published" mean?

"To give final approval, it is necessary to have carefully read the entire manuscript from start to finish".

What does "agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved" mean?

"Each author is accountable for the work and should have confidence in the integrity of the other authors' contributions. Each author should be able to identify who wrote each section." The addition of this fourth criterion was motivated by situations in which some authors were unable to, or refused to, respond to inquiries on potential scientific misconduct regarding certain aspects of the study or by denying any responsibility."

Please note that according to I3S Authorship Guidelines:

- All authors should qualify for authorship, and all those who qualify should be listed. Individuals who meet some of the criteria, but not all, should be listed in the acknowledgments section.
- The criteria for establishing the sequence of authors should be agreed by all. Authors should decide how this will be determined at the initiation of the work, including the designation of the lead and corresponding authors, who may or may not be the same person. Final order, however, should be based on authors' actual roles and contributions in the development of the publication (it is work in progress). Those who made the greatest contribution are generally listed first, but alphabetical order may also be used.

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2. UNETHICAL AUTHORSHIP

(see I3S Authorship Guidelines, no.5 and 6)

Three types of authorship are unacceptable and should be considered as scientific misconduct:

"ghost" authors, who contribute substantially to the work but are not acknowledged (they are usually hidden due to conflicts of interest);

"guest" authors, who make no relevant contribution, but are listed to help increase the chances of publication; and

"gift" authors, whose contribution is based solely on a tenuous affiliation with a study (e.g. the departmental head or those performing various non-author tasks such as reviewing the manuscript before submission, recruiting study subjects (without further significant contribution), supervising or recruiting co-authors) and who are often gifted authorship to improve curriculum vitae.

It may be useful to describe in the contributorship section of the publication whether alphabetical order or some other convention was used to determine author order. CRediT (Contributor Roles Taxonomy) is a high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output:

- Conceptualization – Ideas; formulation or evolution of overarching research goals and aims.
- Data curation – Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.
- Formal analysis – Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.
- Funding acquisition - Acquisition of the financial support for the project leading to this publication.
- Investigation – Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.
- Methodology – Development or design of methodology; creation of models.
- Project administration – Management and coordination responsibility for the research activity planning and execution.

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- Resources – Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.
- Software – Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.
- Supervision – Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.
- Validation – Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.
- Visualization – Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.
- Writing – original draft – Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).
- Writing – review & editing – Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.

The criteria of authorship order are known to vary according to disciplines. In biomedicine (health and life sciences) the criteria are usually the following:

- **First author**: it is customary for the researcher who did the majority of the work and prepared the first version of the manuscript to be listed as the first author. If the first and second authors contributed equally, this should be mentioned in a footnote ('these authors contributed equally to this study'). A similar construction might be used for last authors ('joint last authorship').
- **Last author**: the researcher who is most broadly involved in the successive components of the project (conception and design, data acquisition, and analysis and interpretation), and who has taken on most responsibilities with respect to supervision of the first author(s), is usually appointed as the last author. In other words, the last author is usually the person with the strongest role in the overall scientific conception and interpretation and organizational supervision of the project and the project members' scientific performance. <u>This role is project related and not determined by 'seniority' or 'departmental hierarchy'.</u>

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- **Corresponding author**: the last author is usually also the corresponding author. There might, however, be good reasons to decide differently, for example if the author will be leaving the group soon after publication.
- **Other authors**: the remaining authors are listed in order of contribution. In some cases, however, the order is based on other principles (e.g. it might be alphabetical or balancing authors from different contributing disciplines). The order in which the authors are listed should be a joint decision, in which the last author lists the final order after consulting all authors.

All researchers at i3S are advised to read and become familiarized with the ICMJE's "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals" and with the Committee on Publication Ethics (COPE)'s guidelines.

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