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EDITORIAL

A call for improved reporting of human islet characteristics in research articles

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The increased availability of isolated human islets for diabetes research and the implementation of islet distribution programmes in several countries worldwide have been driving forces behind the rapidly expanding number of scientific reports on studies using human islets. In this issue of *Diabetologia*, Hart and Powers [1] not only review the progress made in human islet research, made possible through their greater availability, but also identify the challenges associated with their use. These include the wide functional heterogeneity observed between islet preparations and the highly variable (and often inadequate) reporting of human islet characteristics in the scientific literature.

Many factors contribute to the functional heterogeneity observed between human islet preparations. These include differences in donor characteristics (age, sex, ethnic background, health status prior to death and cause of death); differences in pancreas procurement (isolation centre, islet handling, estimated purity and viability); warm and cold ischaemia times; and tissue culture [1]. All of these factors influence, to varying degrees, the morphology and function of the islets as investigated in the laboratory [2–5]. For example, out of the 13 islet preparations from donors without diabetes for which islet cell composition is provided in the Human Pancreas Analysis Program PancDB database of the Human Islet Research Network [6], the relative proportion of islet beta cells ranged from 28.5% to 75.8% of the total endocrine cell population (e.g. alpha, beta, delta and epsilon cells).

Hart and Powers [1] surveyed 241 papers reporting the use of isolated human islets, published over a 4 year period, and found large discrepancies in the type of information provided by authors regarding the characteristics of the islets used in these studies. Over half of them did not provide any functional data. In addition, the experimental approaches used to measure human islet function lacked any kind of standardisation.

Based on their analysis and their own experience, the authors call on the 'human islet research ecosystem', which includes organ procurement organisations, islet isolation and phenotyping centres, islet distribution programmes, investigators, funding agencies and scientific journals, to 'develop more holistic, nuanced and sophisticated standards and criteria for assessing and reporting critical characteristics of human islets used for research' [1]. They further propose a list of actions to be taken by each member of this ecosystem towards better standardisation and provide a possible template for providing key information on human islet preparations reported in research papers.

As leading scientific journals in the field of islet biology and pathophysiology, *Diabetologia* and *Diabetes* endorse the general objectives set forth by Hart and Powers. We believe that these objectives will facilitate comparisons among studies using isolated human islets by improving the reporting and, to

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the extent possible, standardisation of the preparations and methods used by individual laboratories. Such objectives are aligned with the current emphasis placed on scientific rigour and reproducibility in research by a number of major funding organisations (including the US National Institutes of Health and the Canadian Institutes of Health Research) and might even be extended, at some point, to other human tissues that are used in biomedical research.

Furthermore, knowledge of the detailed characteristics of the islets employed in the increasing number of studies that involve global, unbiased genetic profiling at the single-cell level (e.g. [7–10]) will be especially important to permit comparisons among the large reference databases that result from these types of studies.

We recognise that this is an ambitious objective that will require a stepwise approach. As a first step, *Diabetologia* and *Diabetes* have created a modified version of the checklist suggested by Hart and Powers [1]. This checklist will be required at the point of submission for any manuscripts that include human islet data (http://diabetologia-journal.org/for-authors/instructions-to-authors/#reporting-guidelines) and will be made available with the published paper. A minimum set of mandatory islet characteristics are listed, as well as others that are recommended to report if they are available. Authors will be required to provide, in table form, the source, isolation centre and unique identifier number for each islet preparation, together with the age, sex, BMI and HbA_{1c} (or other measure of glucose control) of the donor, and whether s/he had diabetes or not. These data will be reported in such a manner that protects the identity of the donor. While we will not make it mandatory at the present time, we encourage the inclusion of additional data to even better characterise the human islets employed for experimentation, including the cause of donor death, measurements of islet purity and viability, functional measures (e.g. glucose-stimulated insulin secretion), ischaemia duration and culture time.

As editors of *Diabetologia* and *Diabetes*, we consider that making these basic metadata available is a good starting point for improving the reproducibility and transparency of the human islet studies reported in our journals.

We hope that the islet community will provide feedback to help us refine and expand the checklist. We believe that authors can more fully document their human islet preparations without this being an undue burden. We are cognisant that not every investigator or distribution centre will have access to this much information and we are also aware of privacy restrictions, protected by law, that may prevent the sharing of some medical metadata. This initiative is just a start, but one that we hope will improve human islet research and further advance our field.

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