The AMERICAN ASSOCIATION of IMMUNOLOGISTS

9650 ROCKVILLE PIKE, BETHESDA, MARYLAND 20814-3994
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

Comment 1

Experiences regarding variation in reagents/resources, including:

- Barriers to identifying reagent composition and methods used to prepare, process, or store specific reagents
- Documentation accompanying proprietary manufacturer-prepared kits
- Characterization and/or validation of reagents/resources
- Batch effects and variability of the same reagents' performance between different labs and with storage time

As mentioned in the RFI, lack of documentation by both reagent companies and researchers can result in variability in research findings. In most instances, however, these companies, rather than the researcher, control how reagents are manufactured, handled, and transported, and determine what information is provided to investigators. More information is often required from the companies in order to determine the composition and comparability of similar reagents from different companies. This issue could be addressed in part by requiring companies to disclose more information, for example, the presence of stabilizing or preservative agents in the product, the type of product validation performed, and a clear "use by" date on the reagent. Further, the companies should reveal more detail regarding the exact protocol(s) and dilution(s) used for product validation.

Comment 2

Solutions to the following issues:

- Common problems with reagents and techniques for developing and storing reagents
- Needs for improved reagents or techniques for developing reagents, including the role of standard protocols
- Actual or perceived barriers to improvements in reagent quality and accessibility
- Needs for standardized terminology

Researchers will often use several different products in an effort to best optimize their assay. Some come across products that fail to yield the advertised results. It would greatly benefit the scientific community if these specific failures were publicly disclosed. This information would save researchers time and money by alerting them to potential issues with that product. It would also make companies more aware of these failures and provide an incentive and opportunity to address them. Therefore, it would be beneficial for companies to be encouraged to provide a public record of the feedback they receive on a specific reagent.

9650 ROCKVILLE PIKE, BETHESDA, MARYLAND 20814-3994
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

Additionally, some reagents are developed by researchers in-house. In some cases, there may be little quality control between lots or batches of reagents generated; this practice may lead to variability in results produced using reagents from different batches. To reduce this variability, NIH should encourage the use of Good Laboratory Practices (GLP) in laboratories that generate their own reagents.

Comment 3

The reagents, techniques, and tools used to improve reagent reproducibility and consistency, including barriers to use.

Comment 4

The means by which students become trained in the consideration of reagent variability as a source of experimental irreproducibility and the processes to control it.

Prior to starting significant studies in the laboratory, students should be trained on proper record keeping for reagents and on the process of optimizing assays using similar reagents from varying sources.

Comment 5

Best practices for chain of custody procedures, such as how reagents are handled, including packaging and temperature control during shipping, and stored from manufacture through use

See answer to Comment 1

Comment 6

Suggestions about best practices for sharing information, including:

Reporting of reagent or resource identification in publications
Changes in quality/activity of reagents

The methods section of any published manuscript is critical for determining why results among laboratories may differ. NIH should urge authors to include in their methods sections applicable details for each reagent used, including but not limited to:

- commercial reagents: manufacturer, catalog number, lot number, concentration used, dilution buffer use

9650 ROCKVILLE PIKE, BETHESDA, MARYLAND 20814-3994
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG

- cell culture: passage number (if known or acknowledged if not), time in culture, date of last mycoplasma testing, derivation of each cell line (or source location), any selection performed, genetic confirmation of line, serum source (including stock number, lot number, and whether it is heat-inactivated);
- primary human cells: gender, any genetic analysis, associated annotation, source of the cells or tissue used; and
- quantitative methods: number of times experiment performed, number of samples used per group, specific method of quantification, details of statistical analyses performed (and which groups were compared).

Another issue that often complicates reagent reproducibility is the referencing of publications in the methods section of articles. If authors use a protocol that is similar to one that has previously been published, the author will often write, "…as described elsewhere [citation]," rather than rewriting the protocol. To ease the burden of page restrictions on journals and researchers, AAI suggests that the NIH consider creating a repository for detailed protocols that could be referenced in publications.

9650 ROCKVILLE PIKE, BETHESDA, MARYLAND 20814-3994
PHONE: 301-634-7178 * FAX: 301-634-7887
E-MAIL: INFOAAI@AAI.ORG * WEB: WWW.AAI.ORG