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Genetic Testing Quality Control Materials Program – Development of verified QC materials for genetic testing.

The Centers for Disease Control and Prevention (CDC) has been involved for many years in efforts to develop appropriate and verified quality control materials for use by the genetics community. Recently, a new CDC-based program – the Genetic Testing Quality Control Materials Program (GTQC) has been established in partnership with the genetics community. The goal of this program is to coordinate a self-sustaining community process to improve the availability of appropriate and verified materials for quality control, proficiency testing, test development, and research. This program hopes to help the genetics community obtain appropriate and verified QC materials, facilitate and coordinate information exchange between users and providers of QC materials, and coordinate efforts for contribution, development, verification and distribution of QC materials for genetic testing.

The GTQC Program is coordinated by the CDC, but all of the actual work, including decisions about QC material priorities, validation schemes, specimen collection, material development and verification, occurs in the laboratories of the genetics community. We invite you to become involved in this process!

Program updates

Website:

The Genetic Testing Quality Control Material Program (GTQC) website has been launched publicly. It can be accessed at: http://www.phppo.cdc.gov/dls/genetics/qcmaterials/default.aspx . The GTQC website provides information about:

- Available QC materials with verification information. The disorder specific tables indicate verification status, verification methods, mutations, and links to sources to obtain these materials.
- Mutations that the program is actively seeking from the community and information about how to submit materials.
- Information about professional and regulatory guidelines, QC references and information about other relevant CDC genetics projects.
- The “contact us” button provides a communication link to the GTQC Program.

QC Materials for standardizing repeat sizing of fragile X:

Fragile X testing is one of the highest volume genetic tests, however, control materials that allow standardization of CGG repeat sizing are still lacking.

- A fragile X repeat standardization workgroup has created a wish list of needed fragile X QC materials.
- Sources of these materials have been identified. Some of them are already available from Coriell Cell repositories. Several researchers from Emory University have offered to donate cell lines from their laboratories for this project! We are currently working with the researchers to get these materials submitted to Coriell.
- The workgroup is currently considering verification schemes.
- The National Institute for Standards in Technology (NIST) has recently introduced an SRM for fragile X testing. The verified QC materials will complement the NIST SRM.

QC materials for Ashkenazi Jewish Panel:

The GTQC is developing QC materials for disorders on the Ashkenazi Jewish Panel (Bloom syndrome, Canavan disease, Fanconi anemia, Familial Dysautonomia, Gaucher disease, mucolipidosis IV, Neimann Pick disease and Tay Sachs disease). The NIGMS collection at Coriell Cell Repositories has cell lines containing mutations for these disorders.

- QC material needs were identified by looking at Ashkenazi Jewish test panels from a number of labs.

- This wish list was compared to cell lines available at Coriell. Many needed materials are already at Coriell, however, we will still need to collect some others.
- We will begin verification of the mutations in volunteer labs very soon (any volunteers?). We also hope to have these mutations verified by sequence analysis. The GTQC program coordinator is currently in contact with a lab who is considering whether they could confirm these cell lines by sequence analysis. (Other sequencing volunteers would also be most welcome!)

QC Materials for Cystic Fibrosis:

The American College of Obstetricians and Gynecologists (ACOG) and the American College of Medical Genetics (ACMG) have recommended 23 mutations that should be included on Cystic fibrosis carrier screening panels.

- Coriell Cell repository offers a 23 mutation CF panel representing the ACOG and ACMG recommendations http://locus.umdnj.edu/nigms/charmut/cfpanel.html . DNA from these cell lines is sold as a CFTR mutation panel that can be used for QC purposes. This panel has not been "officially" verified.
- The GTQC program coordinator is currently in discussions with several labs that may be able to confirm the mutations in these cell lines (and some flanking DNA) by sequence analysis.
- Plans are being developed to collect data from future users of this panel that will provide information on the performance of these materials in a variety of CF test formats.

QC Materials for Huntington Disease:

- We are aware of an extensive collection of characterized Huntington cell lines.
- The GTQC Expert Committee is considering what repeat sizes should be represented in an ideal Huntington panel and whether we should proceed with verification at this time.
- NIST is considering the development of an SRM for Huntington. We will work to assure that QC materials developed by the GTQC Program will be complementary to newly developed NIST SRMs.

The material donation process

The growth in genetic testing requires development of new QC materials. These materials are sometimes available from cell repositories, however, needed materials often must be developed from patient specimens. The GTQC is working to assist potential contributors to facilitate submission of materials to cell repositories.

- Collaborators at three institutions submitted protocols to their local IRBs requesting permission to donate anonymized residual blood and recollected patient blood with consent to Coriell. In all three cases, only submission of recollected specimens with patient consent was allowed. Submission of anonymized residual patient specimens was denied at all three institutions.
- Submission of preexisting cell lines has not been explored.
- We are currently seeking guidance from the CDC IRB on these issues.

Please visit our website (http://www.phppo.cdc.gov/dls/genetics/qcmaterials/default.aspx).

If you would like to join the effort by providing guidance and suggestions, donating materials, or participating in material verification, we would welcome your participation!!!

Please contact me for more information!

-Lisa

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