Skip *in vitro* with ATCC® Genuine Nucleics

The extraction, preparation, and verification of nucleic acids can often require extensive amounts of time, labor, and expense. To save you time and money, ATCC has developed stabilized, quantitative nucleic acids for use in inclusivity/exclusivity testing, establishing limits of detection, and validating or comparing test methods. Our portfolio of quantitative products includes:

- **Synthetic nucleic acids** – DNA and RNA synthetically manufactured under an ISO 13485 certified process to include key target regions from select bacterial and viral strains
- **Genomic nucleic acids** – Whole genome preparations aseptically prepared from minimally passaged ATCC® Genuine Cultures
- **Certified reference materials** – Genomic DNA produced under an ISO 17034 accredited process to confirm identity, well-defined characteristics, and an established chain of custody

So, skip *in vitro* and let ATCC do the work for you! Trust ATCC Genuine Nucleics for your laboratory’s molecular needs, and get your research started today.

Put ATCC genuine nucleics to work for you

ATCC nucleic acids can be used for assay development, verification, validation, monitoring of day-to-day test variation, and lot-to-lot performance of molecular-based assays. Quantitative formats also allow for the generation of a standard curve to determine microbial load.

To learn more about ATCC nucleic acid research, visit us online at www.atcc.org/GenuineNucleics.

**Synthetic nucleic acids**

ATCC performs extensive research on select organisms, and works with collaborators to identify key target regions within the genome that are compatible with primers used in molecular assays. Multiple sequence alignment allows for the development of a consensus sequence that is used to synthetically build the finished product.

- Eliminate the need to culture microorganisms
- Use in a BSL-1 facility
- No shipping restrictions
- Manufactured under ISO 13485
- Quantified using Droplet Digital™ PCR (ddPCR™)

Each preparation is extensively tested to ensure product identity, stability, quantity, and functionality with molecular applications. What’s more, each DNA or RNA preparation is stabilized using a DNA- or RNA-based BioMātrica® stabilization matrix (DNAstable®, RNAs\_table®) to ensure consistent results, run after run.

**Table 1.** Quantitative Synthetic Nucleic Acids

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Organism</th>
<th>Source Information</th>
<th>Research Applications</th>
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<tbody>
<tr>
<td>VR-3249SD™</td>
<td>BK virus</td>
<td>Full length genome of BK virus derived from a plasmid clone</td>
<td>Blood-borne Disease Research</td>
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<tr>
<td>VR-3233SD™</td>
<td>Hepatitis C virus</td>
<td>Fragments from 5'UTR and X-tail region (3'UTR)</td>
<td>Blood-borne Disease Research</td>
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<tr>
<td>VR-3247SD™</td>
<td>Human gammaherpesvirus 4</td>
<td>Fragments from LMP2, BNRF-1, EBER-1, BAMH1W, EBNA-2, BHRF-1, EBNA-1 Region, BXLF-1, BALF-5, and LMP-1</td>
<td>Blood-borne Disease Research</td>
</tr>
<tr>
<td>VR-3261SD™</td>
<td>Human herpesvirus 8</td>
<td>Fragments from the minor capsid protein (ORF 26) and the latency-associated nuclear</td>
<td>Blood-borne Disease Research</td>
</tr>
</tbody>
</table>

![Standard Curve](image)

Log Starting Quantity

Standard curve generated using the Synthetic Dengue virus (DENV) type 4 molecular standard.
<table>
<thead>
<tr>
<th>ATCC® No.</th>
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<tbody>
<tr>
<td>VR-3237SD™</td>
<td>Sapovirus</td>
<td>Fragments from the RNA-dependent RNA polymerase, VP1, and polypeptide regions.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-3238SD™</td>
<td>Astrovirus</td>
<td>Fragments from ORF1a, ORF1b, ORF2, and 3’ UTR regions.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>PRA-3000SD™</td>
<td>Cyclospora cayetanensis</td>
<td>Full 18S rRNA gene sequence, and full ITS1 and ITS2 sequences.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>PRA-3011SD™</td>
<td>Cryptosporidium hominis</td>
<td>Fragments from 18s rRNA, heat shock protein 70 (hsp70), COWP, GP60, dnak-like protein, and LIB13 regions</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>PRA-30075SD™</td>
<td>Dientamoeba fragilis</td>
<td>Fragments from the 18s ribosomal RNA, internal transcribed spacer 1 (ITS1), and 5.8s ribosomal RNA regions</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>PRA-30065SD™</td>
<td>Giardia lamblia</td>
<td>Fragments from the 18s ribosomal RNA, beta-giardin, triose-phosphate isomerase, and glutamate dehydrogenase regions.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-3257SD™</td>
<td>Hepatitis A virus</td>
<td>Fragments from the 5’ untranslated region, viral capsid proteins (VP1-4), self-cleaving peptide 2A, proteinase 3C, and 3D RNA polymerase.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-3258SD™</td>
<td>Hepatitis E virus</td>
<td>Fragments from the 5’ untranslated region, methyl transferase, Y domain, X domain, helicase, RNA-directed RNA polymerase, and open reading frames 2 and 3 (ORF2 and ORF3)</td>
<td>Digestive System Disease Research</td>
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<td>VR-3260SD™</td>
<td>Human parechovirus 3</td>
<td>Fragments from the 5’UTR and the viral protein VP1.</td>
<td>Digestive System Disease Research</td>
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<td>VR-3255SD™</td>
<td>Murine Norovirus</td>
<td>Fragments from the 5’UTR, NS1/2, NS5, NS6, NS7, GP1, VP1, GP2, GP3, and 3’UTR.</td>
<td>Digestive System Disease Research</td>
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<td>VR-3234SD™</td>
<td>Norovirus GI</td>
<td>Fragments from the RNA-dependent RNA polymerase and VP1 regions.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-3235SD™</td>
<td>Norovirus GI</td>
<td>Fragments from the RNA-dependent RNA polymerase, VP1, and VP2 regions.</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-326AD™</td>
<td>Human herpesvirus 6</td>
<td>Fragments from U31, U38, U57, U65/U66, U67, U90, and U94 regions.</td>
<td>Neurological Disease Research</td>
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<td>VR-3265SD™</td>
<td>Human herpesvirus 7</td>
<td>Fragments from U10, U31, U38, U42, and U57 regions.</td>
<td>Neurological Disease Research</td>
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<tr>
<td>BAA-4000SD™</td>
<td>Coxiella burnetii</td>
<td>Fragments from the com1, icd, transposase (IS1111A), gyrA, and sodB regions.</td>
<td>Respiratory Disease Research</td>
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<td>VR-3251SD™</td>
<td>Human bocavirus</td>
<td>Fragments from the 5’UTR, NS1, NP1, VP1, VP2, and 3’UTR genes.</td>
<td>Respiratory Disease Research</td>
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<td>VR-32625D™</td>
<td>Human coronavirus strain HKU1</td>
<td>Fragments from the acidic tandem repeat region, growth factor-like protein, NTPase/helicase domain, RNA-dependent RNA polymerase, spike, and nucleocapsid regions</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3263SD™</td>
<td>Human coronavirus strain NL63</td>
<td>Fragments from NSP3 (ORF 1A), RdRp (nsP12), NTPase (nsP13), nsp16, spike protein, nucleocapsid, and 3’UTR regions.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3250SD™</td>
<td>Human metapneumovirus (hMPV)</td>
<td>Fragments from the N, P, M, F, and L genes.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3248SD™</td>
<td>Middle East respiratory syndrome coronavirus (MERS-CoV)</td>
<td>Fragments from the ORF1ab, ORF5, upper envelope (upE), ORF8b, nucleocapsid (N) protein gene, and 3’UTR regions</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3276SD™</td>
<td>Severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2)</td>
<td>Fragments from ORF1ab (including ORF-1b-nsp14 and RdRp), Envelope, and Nucleocapsid regions.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3277SD™</td>
<td>Severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2)</td>
<td>Fragment from the 5’ Glycoprotein (Spike) region.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3278SD™</td>
<td>Severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2)</td>
<td>Fragment from the 3’ Glycoprotein (Spike) region.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3279SD™</td>
<td>Severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2)</td>
<td>Fragment from the nsp9 and nsp12 (RdRp) regions.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-3280SD™</td>
<td>Severe acute respiratory syndrome coronavirus (2003) (SARS-CoV)</td>
<td>Fragment from the nsp9 (RdRp), nsp11 and N regions.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>BAA-4001SD™</td>
<td>Chlamydia trachomatis LGV Type 1</td>
<td>Fragments from MOMP, 16S rRNA, pmpH, dnaB, putative virulence plasmid integrase regions, and conserved hypothetical virulence plasmid protein</td>
<td>Reproductive Health Research</td>
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<tr>
<td>ATCC® No.</td>
<td>Organism</td>
<td>Source Information</td>
<td>Research Applications</td>
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<td>BAA-40025D™</td>
<td><em>Chlamydia trachomatis</em> LGV Type 2</td>
<td>Fragments from MOMP, 16S rRNA, pmpH and dnaB regions</td>
<td>Reproductive Health Research</td>
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<tr>
<td>BAA-40035D™</td>
<td><em>Chlamydia trachomatis</em> LGV Type 3</td>
<td>Fragments from MOMP, 16S rRNA, pmpH and dnaB regions</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>VR-32455D™</td>
<td>Human immunodeficiency virus 1 (HIV-1)</td>
<td>Fragments from the 5' LTR, gag gene, pol gene (including protease, reverse transcriptase, and integrase regions), tat gene, rev gene, and nef gene.</td>
<td>Reproductive Health Research &amp; Blood-borne Disease Research</td>
</tr>
<tr>
<td>VR-32595D™</td>
<td>Human T-cell leukemia virus 2 (HTLV-2)</td>
<td>Provilial genome sequence of HTLV-2 except the long terminal repeats (LTRs)</td>
<td>Reproductive Health Research &amp; Blood-borne Disease Research</td>
</tr>
<tr>
<td>VR-32325D™</td>
<td>Hepatitis B virus (HBV)</td>
<td>Fragments from the highly conserved precore, core, P, S and X regions</td>
<td>Reproductive Health Research &amp; Blood-borne Disease Research</td>
</tr>
<tr>
<td>VR-32665D™</td>
<td>Human immunodeficiency virus 2 (HIV-2)</td>
<td>Fragments from the envelope (ENV), group specific antigen (GAG) and DNA polymerase (POL) regions</td>
<td>Reproductive Health Research &amp; Blood-borne Disease Research</td>
</tr>
<tr>
<td>VR-32405D™</td>
<td>Human papillomavirus 16</td>
<td>Full length genome of HPV 16 derived from a plasmid clone</td>
<td>Reproductive Health Research</td>
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<tr>
<td>VR-32415D™</td>
<td>Human papillomavirus 18</td>
<td>Full length genome of HPV 18 derived from a plasmid clone</td>
<td>Reproductive Health Research</td>
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<tr>
<td>VR-32565D™</td>
<td>Human papillomavirus 31</td>
<td>Full length genome of HPV 31 derived from a plasmid clone</td>
<td>Reproductive Health Research</td>
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<tr>
<td>BAA-26415D™</td>
<td><em>Mycoplasma genitalium</em></td>
<td>Fragments from the 16S gene, mgpA, and gap</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>BAA-26425D™</td>
<td><em>Treponema pallidum</em></td>
<td>Fragments from the polA, tpr, 23S gene, ap, 16S gene, flaA, 47kDa protein gene, and bmp</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>BAA-40045D™</td>
<td><em>Ureaplasma urealyticum</em></td>
<td>Fragments from 16S rRNA, ureA, intergenic region 1, ureB, intergenic region 2, ureC, ureG, and MRA regions</td>
<td>Reproductive Health Research</td>
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<tr>
<td>PRA-30085D™</td>
<td><em>Babesia canis</em></td>
<td>Partial sequence of 18S ribosomal RNA</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32465D™</td>
<td>Chikungunya virus</td>
<td>Fragments from the 5' UTR, nsP1, nsP2, nsP3, nsP4, E2, and E1 genes</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32285D™</td>
<td>Dengue virus type 1</td>
<td>Fragments from the capsid, membrane, and envelope regions</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32395D™</td>
<td>Dengue virus type 2</td>
<td>Fragments from the capsid, membrane, and envelope regions</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32305D™</td>
<td>Dengue virus type 3</td>
<td>Fragments from the capsid, membrane, and envelope regions</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32315D™</td>
<td>Dengue virus type 4</td>
<td>Fragments from the capsid, membrane, and envelope regions</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32395D™</td>
<td>Eastern equine encephalitis virus</td>
<td>Fragments from the capsid, NSP1, NSP3, 3’ UTR, E1 envelope glycoprotein, and the E2 envelope glycoprotein regions</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>PRA-30015D™</td>
<td><em>Plasmodium malariae</em></td>
<td>Fragments from the 18S rRNA gene, UTR, cycloxygenase 1 and 3 (Cox1 &amp; Cox3), and Cytochrome B (Cytb) region</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>PRA-30045D™</td>
<td>Plasmodium vivax</td>
<td>Fragments from 18S rRNA, mitochondrial DNA, cox3, cox1, cytB, and Aspartic protease PM4 regions</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32735D™</td>
<td>Powassan virus lineage I</td>
<td>Fragments from the E, NS1, NS5, and 3’ UTR regions.</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32755D™</td>
<td>Powassan virus lineage II</td>
<td>Fragments from the E, NS1, NS5, and 3’ UTR regions.</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32545D™</td>
<td>Rift Valley fever virus</td>
<td>Fragments from the long, medium, and small genome segments, including the Gn, Nss, and Nsm genes</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32365D™</td>
<td>Saint Louis encephalitis virus</td>
<td>Fragments from the NS1 gene, premembrane, envelope, NS5 gene, and 3’ UTR regions.</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>PRA-30125D™</td>
<td><em>Trypanosoma cruzi</em></td>
<td>Fragments from 18S rRNA, Kinetoplast minicircle, and Lathosterol oxidase (TcSC5D) regions, and a full-length satellite sequence.</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>VR-32745D™</td>
<td>West Nile virus</td>
<td>Fragments from the 5’ UTR, capsid, anchored capsid protein, membrane glycoprotein precursor (prM), Envelope protein (ENV), Nonstructural protein NS1, Nonstructural protein NS2A, Nonstructural protein NS3, RNA-dependent RNA polymerase NS5 and 3’ UTR regions.</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32535D™</td>
<td>Yellow fever virus</td>
<td>Fragments from the capsid protein C, Pre-M, Envelope protein, NS1, NS2A, NS3, and NS5 regions.</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32525D™</td>
<td>Zika virus</td>
<td>Fragments from the membrane glycoprotein precursor M, Envelope, NS1, NS2B, NS3, NS4B, and NS5 regions</td>
<td>Vector-borne Disease Research</td>
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<tr>
<td>VR-32685D™</td>
<td>Lassa virus</td>
<td>Fragments from 5’ UTR and glycoprotein regions</td>
<td>Zoonotic Disease Research</td>
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<tr>
<td>VR-32695D™</td>
<td>Nipah virus</td>
<td>Complete nucleocapsid protein and fragments from the matrix and glycoprotein regions</td>
<td>Zoonotic Disease Research</td>
</tr>
</tbody>
</table>
Genomic nucleic acids

ATCC genomic nucleic acids are whole genome preparations aseptically prepared from minimally passaged ATCC® Genuine Cultures. Each preparation is supported by stringent quality control testing to ensure product authenticity and functionality, including one or more of the following analyses:

- Agarose gel electrophoresis to ensure integrity
- Spectrophotometry to evaluate purity
- Droplet Digital™ PCR (ddPCR™) to calculate concentration
- PCR to confirm functional activity
- Sequencing and short tandem repeat analyses confirm species identity

Further, each of our products is manufactured under ISO 9001 certified and ISO/IEC 17025 accredited processes, so you can trust your results and reproduce your data – every time.

**Table 2.** Quantitative Genomic Nucleic Acids

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Organism</th>
<th>Source Information</th>
<th>Research Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1015DQ™</td>
<td><em>Aspergillus niger</em></td>
<td>Agricultural Research</td>
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<tr>
<td>17023DQ™</td>
<td><em>Rhodobacter sphaeroides</em></td>
<td>Biotechnology Research</td>
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<tr>
<td>VR-538DQ™</td>
<td>Human herpesvirus 5</td>
<td>Blood-related Disease Research</td>
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<tr>
<td>VR-1367DQ™</td>
<td>Human herpesvirus 3 (Varicella-zoster virus)</td>
<td>Blood-related Disease Research</td>
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<tr>
<td>700532DQ™</td>
<td><em>Neisseria meningitidis</em></td>
<td>Blood-related Disease Research</td>
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<tr>
<td>12453DQ™</td>
<td><em>Proteus mirabilis</em></td>
<td>Blood-related Disease Research</td>
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<tr>
<td>25285DQ™</td>
<td><em>Bacteroides fragilis</em></td>
<td>Digestive System Disease Research</td>
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<td>50608DQ™</td>
<td><em>Blastocystis hominis</em></td>
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<td>700819DQ™</td>
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<td>750DQ™</td>
<td><em>Candida tropicalis</em></td>
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<td>8090DQ™</td>
<td><em>Citrobacter freundii</em></td>
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<td><em>Clostridoides difficile</em></td>
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<td>PRA-67DQ™</td>
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<td><em>Entamoeba histolytica</em></td>
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<td>700802DQ™</td>
<td><em>Enterococcus faecalis</em></td>
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<td>700221DQ™</td>
<td><em>Enterococcus faecium</em></td>
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<td><em>Escherichia coli</em></td>
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<td>10798DQ™</td>
<td><em>Escherichia coli</em></td>
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<td><em>Escherichia coli O6</em></td>
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<td>43895DQ™</td>
<td><em>Escherichia coli O157:H7</em></td>
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<td>700926DQ™</td>
<td><em>Escherichia coli</em></td>
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<td>700928DQ™</td>
<td><em>Escherichia coli</em></td>
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<td>Digestive System Disease Research</td>
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<td>BAA-2196DQ™</td>
<td><em>Escherichia coli O26:H11</em></td>
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<td><em>Escherichia coli O103:H11</em></td>
<td>Digestive System Disease Research</td>
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<td>BAA-2219DQ™</td>
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<td>Digestive System Disease Research</td>
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<td>BAA-2326DQ™</td>
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<td>Digestive System Disease Research</td>
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<td>BAA-2440DQ™</td>
<td><em>Escherichia coli O111</em></td>
<td>Digestive System Disease Research</td>
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<tr>
<td>29212DQ™</td>
<td><em>Enterococcus faecalis</em></td>
<td>Digestive System Disease Research</td>
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</table>
Table 2: Quantitative Genomic Nucleic Acids

<table>
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<tr>
<th>ATCC® No.</th>
<th>Organism</th>
<th>Source Information</th>
<th>Research Applications</th>
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<tbody>
<tr>
<td>27766DQ**</td>
<td><em>Faecalibacterium prausnitzii</em></td>
<td>Human feces</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>30888DQ**</td>
<td><em>Giardia intestinalis</em></td>
<td>Human female, Portland, OR, 1971</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>70039DQ™</td>
<td><em>Helicobacter pylori</em></td>
<td>Stomach of a human patient with gastritis; UK</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-930DQ**</td>
<td>Human adenovirus 41</td>
<td>Feces from child with gastroenteritis, Netherlands, 1973</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-1775DQ**</td>
<td>Human Enterovirus 71</td>
<td>Stool sample from 2-month-old male with aseptic meningitis</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-931DQ**</td>
<td>Human mastadenovirus F</td>
<td>Feces, infantile gastroenteritis, Netherlands, 1979</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>BAA-679DQ**</td>
<td><em>Listeria monocytogenes</em></td>
<td>Tissue, animal - rabbit, Cambridge United Kingdom, 1924</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>BAA-968D™</td>
<td><em>Mycobacterium avium subsp. paratuberculosis</em></td>
<td>Animal feces, Wisconsin, 1990</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-824DQ**</td>
<td>Reovirus 3</td>
<td>Child with diarrhea</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>VR-2018DQ**</td>
<td>Rotavirus A</td>
<td>Diarrhea stool from patient positive for rotavirus</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>700720DQ™</td>
<td><em>Salmonella enterica subsp. enterica serovar Typhimurium</em></td>
<td>Wild type strain isolated from a natural source; 1948</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>BAA-611DQ**</td>
<td><em>Streptococcus agalactiae</em></td>
<td>Clinical specimen, Human</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>PRA-310DQ**</td>
<td><em>Toxoplasma gondii</em></td>
<td>Derived from in vivo RH strain ATCC 50174</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>39315DQ**</td>
<td><em>Vibrio cholerae</em></td>
<td>Stool from cholera patient, Bangladesh</td>
<td>Digestive System Disease Research</td>
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<tr>
<td>17978DQ**</td>
<td><em>Acinetobacter baumannii</em></td>
<td>Fatal meningitis of a 4-month old infant</td>
<td>Epidermal Disease Research</td>
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<td>10231DQ**</td>
<td><em>Candida albicans</em></td>
<td>Man with bronchomycosis</td>
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<tr>
<td>22019DQ**</td>
<td><em>Candida parapsilosis</em></td>
<td>Case of sprue, Puerto Rico</td>
<td>Epidermal Disease Research</td>
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<td>VR-1432DQ**</td>
<td>Human enterovirus 71</td>
<td>Vesicular fluid from an adult female with hand, foot, and mouth disease, Wuhan, China.</td>
<td>Epidermal Disease Research</td>
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<tr>
<td>VR-1467DQ**</td>
<td>Human herpesvirus 6B</td>
<td>Peripheral blood lymphocytes from a 36-year-old male AIDS patient, Zaire, Africa</td>
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<tr>
<td>47085DQ**</td>
<td><em>Pseudomonas aeruginosa</em></td>
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<td>Epidermal Disease Research</td>
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<tr>
<td>9027DQ**</td>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Outer ear infection</td>
<td>Epidermal Disease Research</td>
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<tr>
<td>6538DQ**</td>
<td><em>Staphylococcus aureus</em></td>
<td>Human lesion</td>
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<td>25923DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>Clinical isolate</td>
<td>Epidermal Disease Research</td>
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<td>29213DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>Wound</td>
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<tr>
<td>43300DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>Clinical isolate, Kansas</td>
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<td>700699DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>Isolated from pus and debrided tissue at surgical incision in sternum of 4-month-old infant; Japan, 1996</td>
<td>Epidermal Disease Research</td>
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<tr>
<td>BAA-1556DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>Wrist abcess, 36-year-old HIV+ man with history of IV drug use</td>
<td>Epidermal Disease Research</td>
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<tr>
<td>BAA-1717DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>From adolescent patient with severe sepsis syndrome, Texas Children's Hospital</td>
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<tr>
<td>BAA-1718DQ**</td>
<td><em>Staphylococcus aureus subsp. aureus</em></td>
<td>From a 12-year-old white female with a buttock abscss</td>
<td>Epidermal Disease Research</td>
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<tr>
<td>12228DQ**</td>
<td><em>Staphylococcus epidermidis</em></td>
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<tr>
<td>19615DQ**</td>
<td><em>Streptococcus pyogenes</em></td>
<td>Pharynx of child following episode of sore throat.</td>
<td>Epidermal Disease Research</td>
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<tr>
<td>70029DQ**</td>
<td><em>Streptococcus pyogenes</em></td>
<td>Infected wound</td>
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<td>47011T1-DQ™</td>
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<tr>
<td>BAA-2975T3-DQ**</td>
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<td>3624T2-DQ**</td>
<td><em>Clostridium perfringens</em> with ATCC 165 Tag 2</td>
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<td>204508DQ**</td>
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<td>Wild type strain</td>
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<td>MYA-4941DQ**</td>
<td><em>Saccharomyces cerevisiae</em></td>
<td>Parent strain used <em>Saccharomyces cerevisiae</em> BJ5465</td>
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<td>VR-1583DQ**</td>
<td><em>JC polyomavirus</em></td>
<td>Brain tumor of owl monkey</td>
<td>Neural Research</td>
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<td><em>Tannerella forsythia</em></td>
<td>Human periodontal pocket, Massachusetts, US</td>
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<td>MYA-646DQ**</td>
<td><em>Candida dubliniensis</em></td>
<td>Oral cavity of HIV-infected patient, Dublin, Ireland</td>
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<td>25586DQ**</td>
<td><em>Fusobacterium nucleatum subsp. nucleatum</em></td>
<td>Cervico-facial lesion</td>
<td>Oral Health Research</td>
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<td>35405DQ**</td>
<td><em>Treponema denticola</em></td>
<td>Human periodontal pocket, Montreal, Canada</td>
<td>Oral Health Research</td>
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<tr>
<td>ATCC® No.</td>
<td>Organism</td>
<td>Source Information</td>
<td>Research Applications</td>
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<td>9643DQ™</td>
<td><em>Aspergillus flavus</em></td>
<td>Shoe sole, New Guinea</td>
<td>Opportunistic Pathogen Research</td>
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<td>MYA-2876DQ™</td>
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<td>Human clinical specimen</td>
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<td>2001DQ™</td>
<td><em>Candida glabrata</em></td>
<td>Feces</td>
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<td>32196DQ™</td>
<td><em>Candida krusei</em></td>
<td>Cabbage frass, Japan</td>
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<td>34449DQ™</td>
<td><em>Candida lusitaniae</em></td>
<td>Pig, Portugal</td>
<td>Opportunistic Pathogen Research</td>
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<tr>
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<td>Spinal fluid</td>
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<td>29905DQ™</td>
<td><em>Proteus vulgaris</em></td>
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<td>Opportunistic Pathogen Research</td>
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<td>27853DQ™</td>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Blood culture</td>
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<td>1022DQ™</td>
<td><em>Aspergillus fumigatus</em></td>
<td>Lung of chicken, Connecticut</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>2054DQ™</td>
<td><em>Aspergillus terreus</em></td>
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<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1558DQ™</td>
<td><em>Betacoronavirus 1</em></td>
<td>Man with cold-like illness</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>4617DQ™</td>
<td><em>Bordetella bronchiseptica</em></td>
<td>Animal blood, Buffalo, New York, USA</td>
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<td>5154DQ™</td>
<td><em>Bordetella holmesii</em></td>
<td>Whooping cough</td>
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<td>1531DQ™</td>
<td><em>Bordetella parapertussis</em></td>
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<td>9797DQ™</td>
<td><em>Bordetella pertussis</em></td>
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<tr>
<td>BAA-589DQ™</td>
<td><em>Chlamydophila pneumoniae</em></td>
<td>Throat of student with acute pharyngitis, Seattle, WA, 1983</td>
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<tr>
<td>53592DQ™</td>
<td><em>Chlamydophila pneumoniae</em></td>
<td>Sputum of pneumonia patient, Georgia</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1360DQ™</td>
<td><em>Enterovirus 68</em></td>
<td>Nasopharyngeal swab of hospitalized 10-month-old female with pneumonia, California, 1962</td>
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<tr>
<td>VR-1826DQ™</td>
<td><em>Haemophilus influenzae</em></td>
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<tr>
<td>VR-1DQ™</td>
<td><em>Human adenovirus 1</em></td>
<td>Adenoid tissue from five-year-old child with hypertrophied tonsils and adenoids, Maryland, 1953</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-7DQ™</td>
<td><em>Human adenovirus 7</em></td>
<td>Throat washing from military recruit with pharyngitis, California, 1954</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-740DQ™</td>
<td><em>Human coronavirus 229E</em></td>
<td>Nasal and throat swabs from man with upper respiratory illness</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-940DQ™</td>
<td><em>Human parainfluenza virus 1</em></td>
<td>Throat swab of 3-year-old boy with acute laryngitis, 1957</td>
<td>Respiratory Disease Research</td>
</tr>
<tr>
<td>VR-93DQ™</td>
<td><em>Human parainfluenza virus 3</em></td>
<td>One-year-old female with pneumonia, Washington, DC, 1957</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-260DQ™</td>
<td><em>Human respiratory syncytial virus</em></td>
<td>17-month-old male with pneumonia, Maryland, 1956</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-955DQ™</td>
<td><em>Human respiratory syncytial virus</em></td>
<td>Throat swab from 23-month-old girl with diffuse interstitial pneumonia, Massachusetts, 1977</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1540DQ™</td>
<td><em>Human respiratory syncytial virus</em></td>
<td>Lower respiratory tract of infant with bronchiolitis and bronchopneumonia, Melbourne, Australia, 1961</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1580DQ™</td>
<td><em>Human respiratory syncytial virus</em></td>
<td>Respiratory secretions from child with acute respiratory disease seen at Children's Hospital of the District of Columbia, Washington, DC, 1962</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1559DQ™</td>
<td><em>Human rhinovirus 1A</em></td>
<td>Naso-pharyngeal washings from patient with mild respiratory illness, Ohio.</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1645DQ™</td>
<td><em>Human rhinovirus 1B</em></td>
<td>Presumed from human throat washings</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-482DQ™</td>
<td><em>Human rhinovirus 2</em></td>
<td>Nasal washing from patient with cold</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1663DQ™</td>
<td><em>Human rhinovirus 17</em></td>
<td>Presumed from throat swab from adult with upper respiratory illness, North Carolina, 1959</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1187DQ™</td>
<td><em>Human rhinovirus 77</em></td>
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<td>Respiratory Disease Research</td>
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<tr>
<td>VR-950DQ™</td>
<td><em>Influenza A virus (H1N1)</em></td>
<td>Patient in Puerto Rico, 1934</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1469DQ™</td>
<td><em>Influenza A virus (H1N1)</em></td>
<td>Patient in Puerto Rico, 1934</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1736DQ™</td>
<td><em>Influenza A virus (H1N1)</em></td>
<td>Nasopharyngeal specimen from a patient positive for Flu A in Virginia, 2009</td>
<td>Respiratory Disease Research</td>
</tr>
<tr>
<td>VR-1884DQ™</td>
<td><em>Influenza A virus (H1N1)</em></td>
<td>Classical reassortant virus derived from A/California/07/2009 (H1N1)pdm09 and A/Puerto Rico/8/1934 (H1N1)</td>
<td>Respiratory Disease Research</td>
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</tbody>
</table>
## Table 2. Quantitative Genomic Nucleic Acids

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<tr>
<td>VR-1894DQ™</td>
<td>Influenza A virus (H1N1)</td>
<td>Isolated from a human in California, USA on April 9, 2009</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1882DQ™</td>
<td>Influenza A virus (H3N2)</td>
<td>Human in Wisconsin, USA, on June 7, 2009</td>
<td>Respiratory Disease Research</td>
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<tr>
<td>VR-1804DQ™</td>
<td>Influenza B virus</td>
<td>Human, Florida, 2006</td>
<td>Respiratory Disease Research</td>
</tr>
<tr>
<td>VR-1885DQ™</td>
<td>Influenza B virus</td>
<td>Classical reassortant virus derived from B/Wisconsin/1/2010 (Yamagata Lineage) and B/Lee/1940</td>
<td>Respiratory Disease Research</td>
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<td>13048DQ™</td>
<td><em>Klebsiella aerogenes</em></td>
<td>Sputum</td>
<td>Respiratory Disease Research</td>
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<tr>
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<td><em>Klebsiella pneumoniae</em></td>
<td>Peritoneal fluid</td>
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<td>Sputum from a 66 year-old man, 1994</td>
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<td>Human lung</td>
<td>Respiratory Disease Research</td>
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<td>VR-106DQ™</td>
<td>Mumps virus</td>
<td>Pooled saliva from patients, Massachusetts</td>
<td>Respiratory Disease Research</td>
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<td>25420DQ™</td>
<td><em>Mycobacterium africanum</em></td>
<td>Expectorate; senegalese with pulmonary TB</td>
<td>Respiratory Disease Research</td>
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<td>35734D™</td>
<td><em>Mycobacterium bovis</em></td>
<td>Bovine milk</td>
<td>Respiratory Disease Research</td>
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<td>Clinical human specimen, July 31, 2000</td>
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<td><em>Mycobacterium microti</em></td>
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<td><em>Mycobacterium pinnipedii</em></td>
<td>Clinical animal specimen, Australia, 1986</td>
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<td><em>Mycobacterium tuberculosis</em></td>
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<td><em>Streptococcus pneumoniae</em></td>
<td>Hospital, Barcelona, Spain, 1984</td>
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<td>11-month-old female with acute laryngotracheobronchitis, Ohio, 1955</td>
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<tr>
<td>VR-283DQ™</td>
<td>Human rhinovirus 16</td>
<td>Throat swab from healthy 2-year-old female, Washington, DC, 1960</td>
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<td>29342DQ™</td>
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<td>Patient with pneumonia</td>
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<tr>
<td>BAA-55DQ™</td>
<td><em>Atopobium vaginae</em></td>
<td>Vaginal flora from a healthy woman, Sweden, 1998</td>
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<td>VR-901BD™</td>
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<td><em>Gardnerella vaginalis</em></td>
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<td><em>Haemophilus ducreyi</em></td>
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<td>VR-59DQ™</td>
<td>Human Herpesvirus 1</td>
<td>Brain, human, encephalitis</td>
<td>Reproductive Health Research</td>
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<tr>
<td>VR-1493DQ™</td>
<td>Human Herpesvirus 1</td>
<td>Lip lesion of human with cold sore</td>
<td>Reproductive Health Research</td>
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<tr>
<td>VR-540DQ™</td>
<td>Human Herpesvirus 2</td>
<td>Brain of a 50 year old female with multiple sclerosis, Iceland</td>
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<td>VR-734DQ™</td>
<td>Human Herpesvirus 2</td>
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<td>33323DQ™</td>
<td><em>Lactobacillus gasseri</em></td>
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<td>Patient with bacterial vaginosis</td>
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<tr>
<td>25258DQ™</td>
<td><em>Lactobacillus jensenii</em></td>
<td>Human vaginal discharge</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>35241DQ™</td>
<td><em>Mobiluncus curtisi</em></td>
<td>Human vagina</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>5243DQ™</td>
<td><em>Mobiluncus mulieris</em></td>
<td>Human vagina</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>3530DQ™</td>
<td><em>Mycoplasma genitalium</em></td>
<td>Urethra of male with non-gonococcal urethritis</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>23114DQ™</td>
<td><em>Mycoplasma hominis</em></td>
<td>Rectal swab</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>700825DQ™</td>
<td><em>Neisseria gonorrhoeae</em></td>
<td>Male patient with disseminated gonococcal infection, 1983</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>29303DQ™</td>
<td><em>Prevotella bivia</em></td>
<td>Endometrium</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>15305DQ™</td>
<td><em>Staphylococcus saprophyticus</em> subsp. <em>saprophyticus</em></td>
<td>Urine</td>
<td>Reproductive Health Research</td>
</tr>
</tbody>
</table>
### Table 2: Quantitative Genomic Nucleic Acids

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Organism</th>
<th>Source Information</th>
<th>Research Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>13813DQ**</td>
<td><em>Streptococcus agalactiae</em></td>
<td>Vaginal exudate from human with acute vaginitis, 1956</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>30001DQ**</td>
<td><em>Trichomonas vaginalis</em></td>
<td>Vaginal exudate, Washington state, 1991</td>
<td>Reproductive Health Research</td>
</tr>
<tr>
<td>PRA-302DQ**</td>
<td><em>Babesia duncani</em></td>
<td>Human blood, Nantucket, MA, 1983</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>PRA-398DQ**</td>
<td><em>Babesia microti</em></td>
<td>Blood, human babesiosis, Nantucket, MA, 1983</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>35210DQ**</td>
<td><em>Borrelia burgdorferi</em></td>
<td>Tick, Ixodes dammini, New York</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>30012DQ**</td>
<td><em>Leishmania major</em></td>
<td>Human, Teheran, Iran, 1949</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>PRA-405DQ**</td>
<td><em>Plasmodium falciparum</em></td>
<td>Blood of a rhesus monkey that became infected while stationed in forest near Entebbe, Uganda, 1947</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>VR-1838DQ**</td>
<td><em>Zika virus</em></td>
<td>Human serum specimen, Puerto Rico, December 2015</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>VR-1843DQ**</td>
<td><em>Zika virus</em></td>
<td>Blood of a rhesus monkey that became infected while stationed as a sentinel in forest near Entebbe, Uganda, 1947</td>
<td>Vector-borne Disease Research</td>
</tr>
<tr>
<td>30174D™</td>
<td><em>Naegleria fowleri</em></td>
<td>Human spinal fluid, Orlando, FL, 1968</td>
<td>Water Contamination</td>
</tr>
</tbody>
</table>

### Certified reference materials

ATCC Certified Reference Materials (CRMs) are quantified and produced under an ISO 17034 accredited process to confirm identity, well-defined characteristics, and an established chain of custody. These tools are ideal for:

- Establishing assay specificity and sensitivity
- Validating or comparing test methods
- Testing and calibration in ISO/IEC 17025 accredited labs

CRMs offer the highest level of quality assurance, accuracy, and traceability, providing you with complete confidence that your results are reliable and reproducible.

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Organism</th>
<th>Source Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>qCRM-15531D™</td>
<td><em>Mycoplasma pneumoniae</em></td>
<td>Isolated by Hayflick from monkey kidney tissue-culture fluids of the FH strain (Eaton Agent Virus) supplied by C. Liu, who recovered this strain in embryonated eggs from a student with atypical pneumonia</td>
</tr>
<tr>
<td>qCRM-17981D™</td>
<td><em>Mycoplasma hyorhinis</em></td>
<td>Nasal cavity of pig</td>
</tr>
<tr>
<td>qCRM-19610D™</td>
<td><em>Mycoplasma gallisepticum</em></td>
<td>Suspension of tracheal and airsac tissues of chickens with chronic respiratory disease</td>
</tr>
<tr>
<td>qCRM-19989D™</td>
<td><em>Mycoplasma fermentans</em></td>
<td>Ulcerative balanitis</td>
</tr>
<tr>
<td>qCRM-23064D™</td>
<td><em>Mycoplasma salvarium</em></td>
<td>Saliva</td>
</tr>
<tr>
<td>qCRM-23206D™</td>
<td><em>Acholeplasma laidlawii</em></td>
<td>Sewage</td>
</tr>
<tr>
<td>qCRM-23714D™</td>
<td><em>Mycoplasma orale</em></td>
<td>Oropharynx of child, Washington, DC</td>
</tr>
<tr>
<td>qCRM-23838D™</td>
<td><em>Mycoplasma arginine</em></td>
<td>Mouse brain experimentally infected with scrapies</td>
</tr>
<tr>
<td>qCRM-25204D™</td>
<td><em>Mycoplasma synoviae</em></td>
<td>Hock joint of chicken</td>
</tr>
<tr>
<td>qCRM-27545D™</td>
<td><em>Mycoplasma hominis</em></td>
<td>Human blood culture</td>
</tr>
</tbody>
</table>