Maxwell® 16 MDx Instrument: Streamlining Nucleic Acid Extraction

Ron Kolojek, Clinical Account Manager  

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Presentation Overview

• Introduction to Promega and our commitment to diagnostic/clinical labs
• Maxwell® 16 MDx Instrument
  • Key features and how it works
  • Two kit formats (SEV & LEV)
  • Sample tracking and reporting
  • Compact footprint
• Compatible Sample Types & Appropriate Extraction Kits
• Extraction Kit Details
  • Specifications
  • Supporting Data
• Summary
Mission Statement

Provide the most innovative biological reagents and integrated systems used in research and applied technology worldwide.
Highlights

- Founded in 1978.
- Headquartered in Madison, Wisconsin
- Fiscal Year 2012 Revenues ~$317M USD
- ~1,200 employees in 15 countries
- Over 2,500 products for life science research and applied science distributed in >125 countries
Breadth of Market Segments

Basic Research
- Academic
- Government
- Academic Screening

Industrial
- Pharma
- Biotech
- CROs

Applied Markets
- Clinical Diagnostics
- Forensic/Paternity
- Consumer Safety
- Environmental Health

Segments in bold are primary markets for Promega.
Capabilities and Strengths

Cellular & Biochemical Technologies
- Assay Design
- Integrated Cellular Biology
- Macromolecular Design
- Protein Analysis
- Organic Chemistry

Nucleic Acid Technologies
- Purification
- Amplification
- Detection

Instrument & Reagent Technologies
- Instrumentation
- Reagents
- Software
- Services
World-Wide Manufacturing

**Madison, WI (Headquarters)**
- Primary reagent manufacturing, dispensing and packaging
- Custom product development, manufacturing, dispensing and packaging
- Quality control testing

**San Luis Obispo, CA**
- Organic chemistry development and manufacturing
- Some dispensing and packaging
- Quality control testing

**Sunnyvale, CA**
- Instrumentation development, manufacturing and testing
- Specialize in detection systems

**Shanghai, China**
- Reagent manufacturing, dispensing and packaging
- Diagnostic reagent manufacturing, dispensing and packaging for the Chinese market

**Seoul, Korea**
- Maxwell® instrumentation development and manufacturing
Quality Management Systems

Quality System implemented to meet requirements for the design, manufacture and distribution of high-quality products

- All manufacturing sites are ISO Certified*
- Comprehensive System able to:
  - Develop
  - Implement
  - Improve

*For more information visit: www.promega.com/ISO
Manufacturing Core Competencies

Technologies
- Integrated automation and instrumentation
- Nucleic acid isolation and purification
- Amplification systems
- Organic synthesis or chemistry
- Protein isolation and purification
- Luminescence

Custom Service Support
- Custom concentration, volumes and packaging
- Custom kit manufacturing
- Support on products
- Global instrument service capabilities
Commitment to Molecular Diagnostics
Expanding Services for IVD Manufacturing

- Additional GMP facility coming to Madison, Wisconsin in 2014
- Flexible manufacturing and dispensing lines
- Manufacturing within environmentally controlled spaces
- Capability to formulate reagents up to 4000 liters
- Includes manufacturing, dispensing and kitting of sample prep products for DNA/RNA purification
Automated filling of bottles and cartridges
  • Fully automated quality control checks
  • 100% inspection for fill volume

Flexible, semi-automated filling for low volume (units) products

Automated packaging of ambient kits—vision system to perform 100% inspection of kit components and label content.

Flexible kit packaging options for breadth of sizes and volumes

Commitment to Molecular Diagnostics
Expanding Services for IVD Manufacturing
Commitment to Our Customers with Global Customer Support

- Technical Service Scientists
- Knowledgeable Sales Force
- Training and Troubleshooting
  - Reagents
  - Instruments (Use and Service)
- Implementation Support
  - New products
  - New protocols
- Protocol & Method Development Support
- 24-hour Internet resources
The Maxwell® 16 MDx System: Reliable, Fast & Easy Automated Nucleic Acid Extraction

✔ Use your time more wisely with decreased hands-on time thanks to an easy-to-use automated system.

✔ Consistently purify high quality nucleic acids reducing the need for repeat purifications.

✔ Streamline your workflow with quick, 30-45 minute instrument run times.

✔ Match your sample type(s) to an optimized Maxwell® 16 purification kit best suited to your downstream application.
Maxwell® 16 MDx Instrument
Quickly Process and Track 1-16 Samples

✓ 30 - 45 minute processing time
✓ Processes 1 to 16 samples per run
✓ Touch screen display and keypad
✓ Barcode reader & sample tracking software
✓ UV light decontamination
✓ Compact footprint
  • 12.8” x 17.3” x 12.9”
  • 41.7lb
✓ 1 year Standard warranty, Premium available
Maxwell® 16 MDx Instrument is a Particle Mover, Not a Liquid Handler

- Nucleic acid is captured on paramagnetic particles and purified through a series of capture & release washes before final elution.
- Fewer breakdowns, clogs and drips leading to cross-contamination.
Two Kit Formats Available to Match Your Sample Requirements

- **Standard Elution Volume (SEV)**
  - 300µl elution
  - ✓ Large sample processing
  - ✓ Less pre-processing (varies by kit)

- **Low Elution Volume (LEV)**
  - 50µl elution
  - ✓ Small sample processing
  - ✓ Higher yield & concentration
Sample Tracking with Barcode Reader Helps Reduce Errors

☐ Reduce human error with critical samples
☐ Provide audit chain of sample custody
☐ Integrate with electronic record keeping in hospital workflow
Detailed Run Report Elements Provide Data on Every Extraction

Instrument fields
- Serial Number
- User ID
- Firmware version
- Installation Date
- Date of last weekly maintenance
- Date of last yearly maintenance
- Date/end and start time of last UV run
- Heater validation
- Protocol name
- Date of run
- Start time of run
- End time of run
- Error code(s)
- Sample position

Fields from Kit
- Kit number
- Lot number
- Expiration date

Fields from barcode or manual entry
- Sample position
- Sample ID
- Assay kit ID
- Notes* (these will not print)
Fewer Consumables and a Highly Compact Footprint Saves Valuable Laboratory Space

**Fewer Plastic Consumables with Maxwell Kits**
(Consumables for 6 extractions)

- RNeasy Mini QIAcube Kit
- Maxwell® 16 simply RNA Kit

**More Compact Footprint**
(Kits for the same number of extractions)
High Quality Service and Support

Fewer moving parts than other purification systems so less can go wrong. But just in case...

Support before, during and after the sale from Promega’s expert sales and service organization
  • One year warranty
  • Service contracts
  • Preventive maintenance
  • Loaner instruments
## DNA Extraction Kits to Match Your Sample Type(s)
Optimized for Reproducible, Quality Extractions

<table>
<thead>
<tr>
<th>Maxwell® 16 Purification Kit</th>
<th>Blood</th>
<th>Buffy Coat</th>
<th>Cells</th>
<th>Fresh Tissue</th>
<th>FFPE Tissue</th>
<th>Buccal Swabs</th>
<th>Saliva</th>
<th>Amniotic Fluid</th>
<th>CSF</th>
<th>Urine</th>
<th>Cervical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood DNA</strong></td>
<td>✓️ a</td>
<td>✓️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓️ c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LEV Blood DNA</strong></td>
<td>✓️ a</td>
<td></td>
<td></td>
<td></td>
<td>✓️ b</td>
<td>✓️ c</td>
<td>✓️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Buccal Swab LEV DNA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cell LEV DNA</strong></td>
<td></td>
<td>✓️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓️</td>
<td>✓️</td>
<td>✓️</td>
<td>✓️</td>
<td>✓️ d</td>
</tr>
<tr>
<td><strong>Tissue DNA</strong></td>
<td></td>
<td>✓️</td>
<td></td>
<td></td>
<td>✓️ c</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FFPE Tissue LEV DNA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FFPE Plus LEV DNA</strong></td>
<td>✓️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

✓️ Original, Promega validated protocol
✓️ Additional protocols developed and tested by Promega scientists

a PAXgene® tube protocol available
b Recommended for buccal samples collected using Omni Swabs
c Oragene® collection device protocol
d ThinPrep® collection device protocol
# RNA Extraction Kits to Match Your Sample Type(s)
Optimized for Reproducible, Quality Extractions

<table>
<thead>
<tr>
<th>Maxwell® 16 Purification Kit</th>
<th>Blood</th>
<th>Buffy Coat</th>
<th>Fresh Tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>simplyRNA Blood (LEV)</em></td>
<td>✔️ a,b</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>simplyRNA Tissue (LEV)</em></td>
<td></td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td><em>Tissue LEV Total RNA</em></td>
<td>✔️ a</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Total RNA (SEV)</em></td>
<td>✔️ a</td>
<td>✔️</td>
<td></td>
</tr>
</tbody>
</table>

- ✔️ Original, Promega validated protocol
- ✔️ Additional protocols developed and tested by Promega scientists
- a PAXgene® tube protocol available
- b Tempus™ tube protocol available
### Total Nucleic Acid Extraction Kits to Match Your Sample Type(s)

<table>
<thead>
<tr>
<th>Maxwell® 16 Purification Kit</th>
<th>Plasma</th>
<th>Serum</th>
<th>Nasal Swab</th>
<th>Cervical</th>
<th>Urine</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral Total Nucleic Acid (LEV)</td>
<td>✔</td>
<td>✔</td>
<td>✔ a</td>
<td>✔ b</td>
<td>✔ c</td>
<td>✔ c</td>
</tr>
</tbody>
</table>

- ✔ Original, Promega validated protocol
- ✔ Additional protocols developed and tested by Promega scientists or customers

- a Detection of RNA from RNA virus
- b SurePath® and ThinPrep® collection device protocol and detection of HPV DNA
- c Detection of bacterial and viral DNA
Maxwell® 16 Blood DNA Purification Kit
Consistent gDNA Isolation from Fresh/Frozen Blood

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit Format:</td>
<td>SEV</td>
</tr>
<tr>
<td>Sample Input:</td>
<td>50-400µl fresh or frozen whole blood collected in EDTA, heparin or ACD tubes</td>
</tr>
<tr>
<td>Pre-processing:</td>
<td>None</td>
</tr>
<tr>
<td>Processing Time:</td>
<td>36 minutes</td>
</tr>
<tr>
<td>Elution Volume:</td>
<td>300µl</td>
</tr>
<tr>
<td>Expected Yield:</td>
<td>8-15µg per 400µl &amp; 4-9µg per 200µl</td>
</tr>
<tr>
<td>Expected Purity:</td>
<td>A_{260}/A_{280} ratios &gt;1.8</td>
</tr>
<tr>
<td>Comments:</td>
<td>None</td>
</tr>
</tbody>
</table>

Isolation of Large, Intact gDNA from Fresh Blood

Consistent Yields from 6 Donors

Consistent PCR Amplification of Human Growth Factor II Gene
Maxwell® 16 Blood DNA Purification Kit
High Yields of Quality gDNA from Buffy Coat

Specifications

<table>
<thead>
<tr>
<th>Kit Format:</th>
<th>SEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Input:</td>
<td>250µl from 2.5ml blood or 500µl from 5ml blood</td>
</tr>
<tr>
<td>Pre-processing:</td>
<td>Buffy coat prep from whole blood</td>
</tr>
<tr>
<td>Processing Time:</td>
<td>36 minutes</td>
</tr>
<tr>
<td>Elution Volume:</td>
<td>300µl</td>
</tr>
<tr>
<td>Expected Yield:</td>
<td>24µg per 250µl @ 107ng/µl &amp; 48µg per 500µl @ 107ng/µl</td>
</tr>
<tr>
<td>Expected Purity:</td>
<td>$A_{260}/A_{280}$ ratios &gt;1.9</td>
</tr>
<tr>
<td>Comments:</td>
<td>Additional protocols available</td>
</tr>
</tbody>
</table>

Comparison of Yields from Buffy Coat Samples and Whole Blood

![Comparison of Yields from Buffy Coat Samples and Whole Blood](image)
Maxwell® 16 LEV Blood DNA Purification Kit
Consistent Isolation of Highly Concentrated gDNA

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit Format:</td>
<td>LEV</td>
</tr>
<tr>
<td>Sample Input:</td>
<td>≤400µl fresh or frozen whole blood collected in EDTA, heparin or ACD tubes</td>
</tr>
<tr>
<td>Pre-processing:</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Processing Time:</td>
<td>44 minutes</td>
</tr>
<tr>
<td>Elution Volume:</td>
<td>50µl</td>
</tr>
<tr>
<td>Expected Yield:</td>
<td>8-10µg per 300µl at concentrations up to 200ng/µl</td>
</tr>
<tr>
<td>Expected Purity:</td>
<td>A\textsubscript{260}/A\textsubscript{280} ratios &gt;1.8</td>
</tr>
<tr>
<td>Comments:</td>
<td>Kit processes up to 500µl of blood. Also used for isolation of DNA from buccal samples collected on Omni Swabs.</td>
</tr>
</tbody>
</table>

![Graph](image)

**Highly Concentrated DNA Isolated from Commonly Used Collection Tubes**

- **DNA Conc. (ng/µl)**
  - Tube Type: E, SC, SH, E, SC, SH

**Percent Yield Remains High Across All Input Volumes**

- **Input Blood Volume (µl)**
  - 400, 200, 100, 50
  - (n=4 at each volume)
Maxwell® 16 Buccal Swab LEV DNA Kit
Consistent Isolation of High Purity gDNA

Specifications

Kit Format: LEV
Sample Input: Buccal samples collected on Puritan Medical Devices swabs (1 or 2 swabs)
Pre-processing: 25 minutes
Processing Time: 44 minutes
Elution Volume: 50µl
Expected Yield: Averages ~7µg per swab with an average concentration of 142ng/µl
Expected Purity: \( A_{260}/A_{280} \) ratios >1.8 and \( A_{260}/A_{230} \) ratios >1.8
Comments: Amount of DNA extracted depends on the number of cells per swab

### High Yields and Purity

<table>
<thead>
<tr>
<th>Donor</th>
<th>Yield (µg)</th>
<th>Conc. (ng/µl)</th>
<th>( A_{260}/A_{280} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>6.80</td>
<td>136.05</td>
<td>1.90</td>
</tr>
<tr>
<td>#2</td>
<td>5.11</td>
<td>102.16</td>
<td>1.82</td>
</tr>
<tr>
<td>#3</td>
<td>8.75</td>
<td>174.96</td>
<td>1.89</td>
</tr>
<tr>
<td>#4</td>
<td>6.43</td>
<td>128.62</td>
<td>1.96</td>
</tr>
<tr>
<td>#5</td>
<td>7.45</td>
<td>148.91</td>
<td>1.95</td>
</tr>
<tr>
<td>#6</td>
<td>6.52</td>
<td>112.10</td>
<td>1.78</td>
</tr>
<tr>
<td>#7</td>
<td>6.52</td>
<td>130.38</td>
<td>1.78</td>
</tr>
<tr>
<td>Avg</td>
<td>6.67 ±1.2</td>
<td>133+/−24</td>
<td>1.86 ± 0.1</td>
</tr>
</tbody>
</table>

### DRB5 SSP Unitray System Analysis of gDNA Isolated from Buccal Swabs

Results predict donor carries DRB5 allele 0202 (lanes 11 and 12). Data matches previous typing of this donor.
Maxwell® 16 FFPE Tissue LEV DNA Kit
Amplifiable gDNA Without Harsh Organics

Specifications

<table>
<thead>
<tr>
<th>Kit Format:</th>
<th>LEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Input:</td>
<td>One to ten 5µm FFPE tissue sections</td>
</tr>
<tr>
<td>Pre-processing:</td>
<td>Overnight proteinase K digestion</td>
</tr>
<tr>
<td>Processing Time:</td>
<td>28 minutes</td>
</tr>
<tr>
<td>Elution Volume:</td>
<td>50µl</td>
</tr>
<tr>
<td>Expected Yield:</td>
<td><strong>Spleen</strong>: 2.8µg @ 56ng/µl, <strong>Kidney</strong>: 2.4µg @ 47ng/µl, <strong>Brain</strong>: 1.5µg @ 30ng/µl</td>
</tr>
<tr>
<td>Expected Purity:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Comments:</td>
<td>This kit yields cleaner DNA than the Maxwell® 16 FFPE Plus LEV DNA Kit.</td>
</tr>
</tbody>
</table>

Easy Protocol and Good Yields

1. Add Lysis Buffer & vortex
2. Add Proteinase K Solution
3. 70°C overnight
4. Prep
5. Purify
6. Quantitate

<table>
<thead>
<tr>
<th>Sample</th>
<th>Yield (µg)</th>
<th>Conc. (ng/µl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spleen</td>
<td>2.8</td>
<td>55.6</td>
</tr>
<tr>
<td>Kidney</td>
<td>2.4</td>
<td>47.5</td>
</tr>
<tr>
<td>Brain</td>
<td>1.5</td>
<td>30.1</td>
</tr>
</tbody>
</table>
Maxwell® 16 FFPE Plus LEV DNA Kit
Rapid Isolation of More gDNA

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit Format:</td>
<td>LEV</td>
</tr>
<tr>
<td>Sample Input:</td>
<td>One to ten 5µm FFPE tissue sections</td>
</tr>
<tr>
<td>Pre-processing:</td>
<td>1 hour or overnight proteinase K digestion (no harsh organics required)</td>
</tr>
<tr>
<td>Processing Time:</td>
<td>28 minutes</td>
</tr>
<tr>
<td>Elution Volume:</td>
<td>50µl</td>
</tr>
<tr>
<td>Expected Yield:</td>
<td>Spleen: 3.6µg @ 72ng/µl, Kidney: 6.1µg @ 122ng/µl, Brain: 4.9µg @ 98ng/µl</td>
</tr>
<tr>
<td>Expected Purity:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Comments:</td>
<td>This kit yields more DNA than the Maxwell® 16 FFPE Tissue LEV DNA Kit.</td>
</tr>
</tbody>
</table>

Shorter Protocol and Higher Yields

1. Add Proteinase K Solution to 70°C 1hr to overnight
2. Add Lysis Buffer & vortex
3. Prep
4. Purify
5. Quantitate

Results from 1 Hour Proteinase K Digestion

<table>
<thead>
<tr>
<th>Sample</th>
<th>Yield (µg)</th>
<th>Conc. (ng/µl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spleen</td>
<td>3.6</td>
<td>72.4</td>
</tr>
<tr>
<td>Kidney</td>
<td>6.1</td>
<td>122.2</td>
</tr>
<tr>
<td>Brain</td>
<td>4.9</td>
<td>98.3</td>
</tr>
</tbody>
</table>
# Maxwell® 16 LEV simplyRNA Blood Kit

**Simple Isolation of Highly Concentrated, Pure RNA**

## Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit Format</td>
<td>LEV</td>
</tr>
<tr>
<td>Sample Input</td>
<td>2.5ml whole blood collected in EDTA tubes</td>
</tr>
<tr>
<td>Pre-processing</td>
<td>10-15 minutes</td>
</tr>
<tr>
<td>Processing Time</td>
<td>63 minutes</td>
</tr>
<tr>
<td>Elution Volume</td>
<td>50µl</td>
</tr>
<tr>
<td>Expected Yield</td>
<td>5-7µg @ 100-140ng/µl</td>
</tr>
<tr>
<td>Expected Purity</td>
<td>$A_{260/280}$ and $A_{260/230}$ are both &gt;2.0</td>
</tr>
<tr>
<td>Comments</td>
<td>PAXgene® &amp; Tempus™ tube protocols and data are available</td>
</tr>
</tbody>
</table>

## More Concentrated RNA vs. Competitor

![Graph comparing RNA yield and purity](image)
Maxwell® 16 LEV simplyRNA Blood Kit
Isolation of Intact RNA Free of gDNA Contamination

Isolation of Intact RNA

<table>
<thead>
<tr>
<th>Sample</th>
<th>Promega</th>
<th>Qiagen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample K</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Isolation of RNA Free of gDNA Contamination

<table>
<thead>
<tr>
<th>Donor</th>
<th>DNA (pg/µl)</th>
<th>RNA (ng/µl)</th>
<th>% DNA Contamination</th>
<th>RNA/total nucleic acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>50.5</td>
<td>189.8</td>
<td>0.027%</td>
<td>99.97%</td>
</tr>
<tr>
<td>B</td>
<td>21.0</td>
<td>180.8</td>
<td>0.012%</td>
<td>99.99%</td>
</tr>
<tr>
<td>K</td>
<td>74.1</td>
<td>183.9</td>
<td>0.040%</td>
<td>99.96%</td>
</tr>
</tbody>
</table>
Maxwell® 16 Viral Total Nucleic Acid Kit
Simple and Rapid Extraction Protocol

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit Format</td>
<td>LEV</td>
</tr>
<tr>
<td>Sample Input</td>
<td>100-300µl serum or plasma</td>
</tr>
<tr>
<td>Pre-processing Time</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Processing Time</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Elution Volume</td>
<td>50µl</td>
</tr>
<tr>
<td>Expected Yield</td>
<td>Detect DNA and RNA viruses by qPCR down to $10^4$ virus particles</td>
</tr>
<tr>
<td>Expected Purity</td>
<td>n.d.</td>
</tr>
<tr>
<td>Comments</td>
<td>Nasal swab, urine, blood, &amp; cervical sample protocols are also available</td>
</tr>
</tbody>
</table>

Simple and Rapid Protocol

1. Vortex 100-300µl serum or plasma
2. Add Lysis Buffer & Proteinase K
3. Incubate 10min @ 56°C
4. Prep
5. Purify
6. Analyze by qPCR or RT-qPCR assays
Maxwell® 16 Viral Total Nucleic Acid Kit
Consistent & Reliable Isolation of vRNA and vDNA

Purification of HCV RNA and CMV DNA Across a Wide Range of Concentrations

- **HCV from Plasma**
  - Equation: $y = 0.4442x + 1648.3$
  - $R^2 = 1$

- **CMV from Serum**
  - Equation: $y = 0.2293x - 2390.8$
  - $R^2 = 0.9993$

No Detectable Cross Contamination of Adjacent Cartridges

- **Positive Cartridges**
- **Adjacent Blank Cartridges**
Other Promega Products to Support the Clinical Lab Workflow

**Extraction**
- Maxwell® 16 Systems (automated)
- ReliaPrep™ Blood gDNA Miniprep
- ReliaPrep™ 96 gDNA HT Miniprep
- ReliaPrep™ Large Volume HT System
- ReliaPrep™ FFPE RNA & DNA

**Quantification**
- QuantiFluor™ Instruments
- QuantiFluor™ dsDNA Dye
- QuantiFluor™ RNA Dye

**Amplification**
- GoTaq® MDX Polymerase
- GoTaq® HotStart
- GoTaq® qPCR Master Mixes
  - Dye-based
  - Probe-based
- GoTaq® RT-qPCR Systems
- dNTPs

**Sample ID/Characterization**
- PowerPlex® Systems (STRs)
Providing Solutions to Meet Your Nucleic Acid Extraction Needs

Maxwell® 16 MDx Instrument

Maxwell® 16 Kits

Service and Support

✓ Reliable
✓ Compact
✓ Quick
✓ Error reduction

✓ Sample type optimized kits
✓ Consistent, high quality DNA/RNA extractions
✓ Improved downstream assays

✓ Comprehensive
✓ New protocol development
✓ Technical support
Thank you for joining us today!