TargetRich™ PGx Panel User Manual

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To download this and other PGx User Manuals, visit:
http:/KailosGenetics.com/targetrich-pgxcomplete

TargetRich™ reagents from Kailos Genetics® facilitates the enrichment of genomic regions of interest for next generation sequencing.

The following library preparation protocol has been optimized for sample preparation prior to paired-end sequencing on an Illumina® next-generation sequencer (MiSeq®, NextSeq®, HiSeq® & MiniSeq®).

Kit Components (for processing 96 reactions)

Component	Volumes (µl)	Storage
Annealing/Digest Master Mix	470	-20° C
Restriction Enzyme	260	-20° C
Patch Ligation Master Mix	325	-20° C
DNA Ligase	60	-20° C
Enzymatic Clean-Up Master Mix	260	-20° C
Universal PCR Master Mix	2 x 1.3 mL	-20° C
DNA Polymerase	120	-20° C
Control Genomic DNA (PC-100) 10 ng/ul stock	85	-20° C

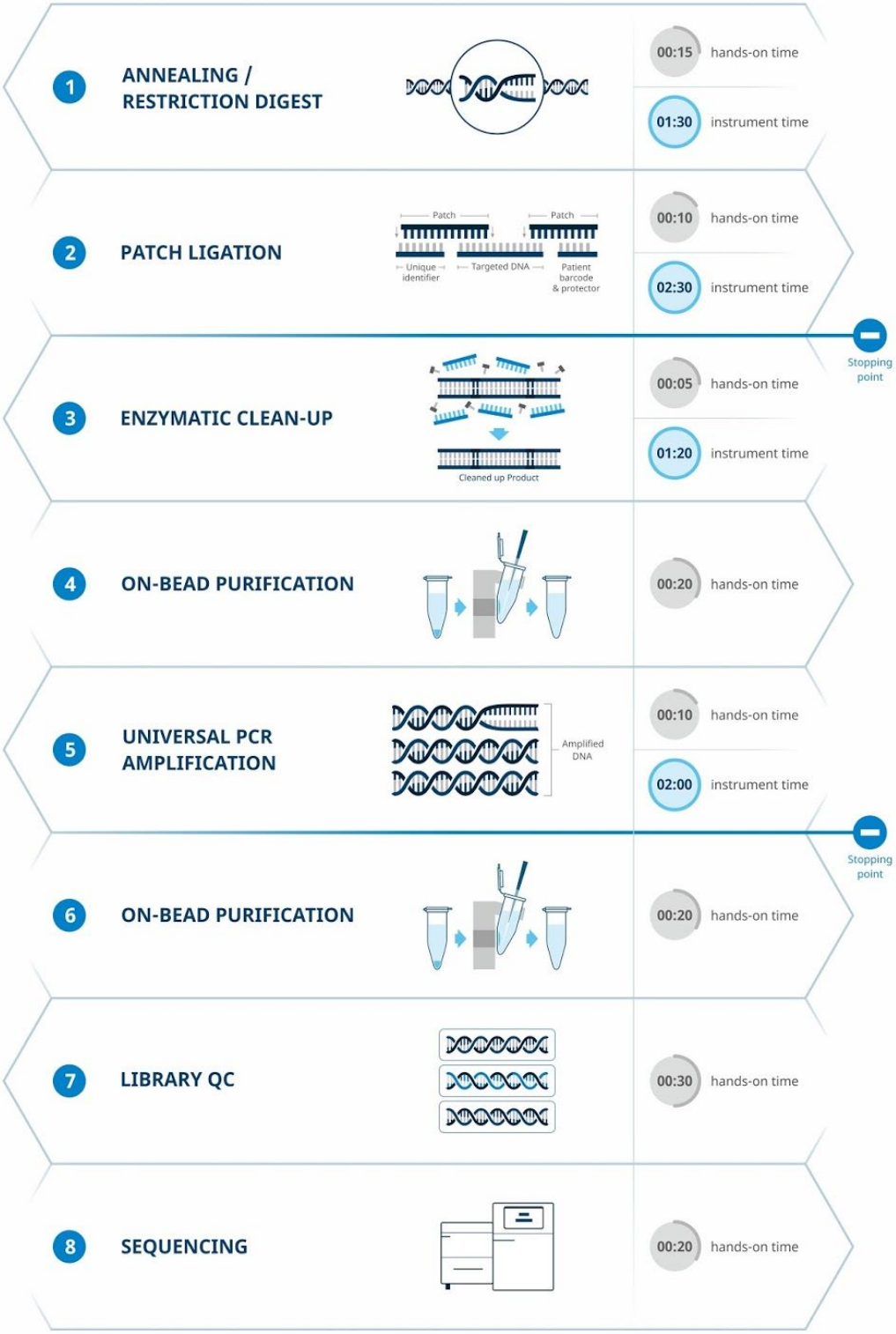
Additional required equipment and materials:

A pre-mixed adapter set (TargetRich UMI/Index Adapter Plate), required for sample barcoding, multiplex sequencing, and tagging of individual captured DNA molecules, is sold separately (Kailos Genetics, Cat#KG-9099).

- Nuclease-free water
- Buffer EB (QIAGEN, 10 mM Tris-Cl, pH 8.5)
- AMPure® XP system, including SPRI magnetic plate (Beckman Coulter®)
- Fluorometric DNA quantification system, such as Qubit® (Life Technologies®)
- Thermal Cycler with ramp speeds of approximately 3°C per second
- Low retention micropipette tips to prevent reagent loss
- 100 µl PCR tubes or low-profile PCR plates

Target Rich Workflow

http://www.kailossolutions.com



Important notes before proceeding

- ❑ *Genomic DNA (PC-100) is provided with the TargetRich PGx reagents and should be used as a positive control. For a negative control, use nuclease-free water.*

- ❑ *To prevent loss of enzymes and master mixes during pipetting, use low retention pipette tips. Additionally, prior to transferring reagents with a multichannel pipette, aliquot reagents into a PCR strip tube.*

- ❑ *As with all PCR-based protocols, regular cleaning and careful handling should be followed to reduce potential contamination. Avoid cross-contamination by changing pipette tips after every addition to a sample.*

- ❑ *If performing the library preparation in a PCR plate, seal the plate before every vortex, centrifuge, and thermal cycler step.*

- ❑ *Thaw all reagents/ samples at room temperature ~15 minutes prior to use.*

- ❑ *Restriction enzyme, DNA Ligase, Enzymatic Clean-up Master Mix, and DNA polymerase should be kept at -20°C until ready to use. Always keep the enzymes in a reagent cooler.*

I. Annealing of Guide Oligos & Restriction Digest

NOTE: *For optimal results, a minimum of 100 ng genomic DNA is required as input. Additionally, the template DNA should be free of restriction digest inhibitors such as EDTA and ethanol carry-over from DNA extraction.*

NOTE: *To ensure accuracy of DNA quantification, using a fluorometric assay, such as Qubit or Quant-iT (Life Technologies®) is recommended. If necessary, DNA may be concentrated using column or bead-based methods prior to this step.*

1. Thaw Annealing-Digest Master Mix.
2. Mix thoroughly by pipetting or vortexing prior to assembling the reaction.
3. For each sample, bring template DNA to a volume of 14 µl with nuclease-free water in a PCR tube or plate and keep on ice.
4. Add 4 µl of Annealing-Digest Master Mix to each DNA sample. Mix thoroughly by pipetting or vortexing.
5. Briefly centrifuge samples to collect all the liquid at the bottom of the tubes or wells.
6. Use a Thermal Cycler to perform the digest. Run the following program:

   Step 1: 98°C, 5 minutes

   Step 2: 37°C, 5 minutes *

   Step 3: 37°C, 60 minutes

   Step 4: 65°C, 20 minutes

   Step 5: 4°C, hold
7. Aliquot the Restriction Enzyme into strip tubes and allow to come to room temperature (~5 minutes).
8. ***After Step 2 on the thermal cycler is complete**, pause the program. Keep samples in the thermal cycler at 37°C. Immediately add 2.0 µl of Restriction Enzyme to each sample. Using a multichannel pipette set to 15 µl volume, thoroughly mix by pipetting the reactions 4 - 5 times. Close the tubes or reseal the plate and resume the program.

II. Patch Ligation

NOTE: *TargetRich UMI/Index Adapters (Catalog #KG-9099) contain both adapters necessary for clustering on the Illumina sequencing flow cell. The index sequence of Adapter 1 defines the identity of a sample. Prior to use, refer to the TargetRich UMI/Index Adapters & Sequencing Manual.*

1. Briefly centrifuge the samples to collect all liquid at the bottom of the wells and keep on ice.
2. Thaw the TargetRich UMI/Index Adapter plate and the Patch Ligation Master Mix.
3. Mix the TargetRich UMI/Index Adapter plate by pipetting or gentle vortexing and briefly centrifuge to collect all the liquid at the bottom of the wells.
4. Add 1.5 µl of the desired TargetRich UMI/Index Adapter to each sample.
5. Mix the thawed Patch Ligation Master Mix by pipetting or vortexing, centrifuge briefly.
6. Combine the Patch Ligation Master Mix and DNA Ligase: Multiply the volumes indicated below by the total number of samples and include overage.
    - *2.7 µl Patch Ligation Master Mix x Total # Samples x 1.2 (with 20% overage)*
    - *0.5 µl DNA Ligase x Total # Samples x 1.2 (with 20% overage)*

   Mix thoroughly after combining and briefly centrifuge to collect all the liquid at the bottom of the tube.
7. Add 3.2 µl of pre-mixed Patch Ligation Master Mix/ DNA Ligase to each sample.
8. Mix thoroughly by pipetting and briefly centrifuge to collect all the liquid at the bottom of the tubes or wells.
9. Initiate the following program on a Thermal Cycler with a heated lid:

   Step 1: 95°C for 15 minutes

   Step 2: 25 cycles of
    - 94°C for 30 seconds
    - 62°C for 4 minutes

   Step 3: 4°C forever
10. Once the lid has heated, place samples in Thermal Cycler until the program has reached completion.
11. ***Samples may remain at 4°C overnight or stored at -20°C.***

III. Enzymatic Clean-up

1. Briefly centrifuge the samples and keep on ice.
2. Mix the Enzymatic Clean-up Master Mix by pipetting and centrifuge briefly.
3. Add 2.0 µl of Enzymatic Clean-up Master Mix to each sample. Mix by pipetting and briefly centrifuge samples to collect all the liquid at the bottom of the tubes or wells.
4. Place samples in a Thermal Cycler with a heated lid and run the following program:

    Step 1: 37°C for 1 hour

    Step 2: 95°C for 20 minutes

    Step 3: 4°C forever

IV. On-bead purification

NOTE: *AMPure® XP beads are required for DNA purification. Bring the beads to room temperature before proceeding with purification.*

1. Briefly centrifuge the samples.
2. Add 49 µl of AMPure® XP beads to each sample, mix thoroughly by pipetting and incubate for 5 minutes at room temperature.
3. Place samples on a magnet plate for 3 minutes to separate beads from solution. Carefully aspirate the cleared solution and discard without disturbing beads.
4. Add 180 - 200 µl of freshly prepared 70% ethanol to each sample and incubate for 30 seconds. Without disturbing the beads, remove ethanol.
5. Repeat step #4 for one additional wash.
6. Set a timer to 5 minutes to air-dry the beads and remove all the remaining traces of ethanol with a 10 - 20 µl fine pipette tip. Do not exceed 5 minutes of total drying time.
7. Immediately remove samples from the magnet plate and resuspend the DNA on beads in 28 µl of nuclease-free water by pipetting thoroughly. Incubate for 2 minutes after resuspending.
8. Place samples on a magnet plate for 3 minutes to separate beads from solution.
9. Carefully aspirate 25 µl of cleared solution containing eluted DNA and transfer to new PCR tubes or plate. Keep samples on ice while proceeding to next step.

V. Universal PCR amplification

1. Mix the Universal PCR Master Mix by pipetting or vortexing.
2. Combine the Universal PCR Master Mix and DNA Polymerase: Multiply the volumes indicated below by the total number of samples and include overage.
    - *24 µl Universal PCR Master Mix x Total # Samples x 1.1 (with 10% overage)*
    - *1.0 µl DNA Polymerase x Total # Samples x 1.1 (with 10% overage)*

   Mix thoroughly after combining and briefly centrifuge to collect all the liquid at the bottom of the tube.
3. Add 25 µl of pre-mixed Universal PCR Master Mix and DNA Polymerase to each sample.
4. Mix thoroughly by pipetting and briefly centrifuge to collect all the liquid at the bottom of the tubes or wells.
5. Initiate the following program on a Thermal Cycler with a heated lid:

   Step 1: 98°C for 2 minutes

   Step 2: 25 cycles of:
    - 94°C for 30 seconds
    - 68°C for 3 minutes

   Step 3: 4°C forever
6. Once the lid has heated, place samples in Thermal Cycler until the program has reached completion.
7. ***Samples may remain at 4°C overnight or stored at -20°C.***

VI. On-bead purification

NOTE: *AMPure® XP beads are required for DNA purification. Bring the beads to room temperature before proceeding with purification.*

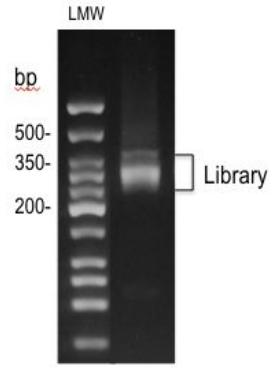
1. Briefly centrifuge the samples.
2. Add 40 µl of AMPure® XP beads to each sample, mix thoroughly by pipetting and incubate for 5 minutes at room temperature.
3. Place samples on a magnet plate for 3 minutes to separate beads from solution. Carefully aspirate the cleared solution and discard without disturbing beads.
4. Add 200 µl of freshly prepared 70% ethanol to each sample and incubate for 30 seconds. Without disturbing the beads, remove ethanol.
5. Repeat step #4 for one additional wash.
6. Set a timer to 5 minutes to air-dry the beads and remove all the remaining traces of ethanol with a 10 - 20 µl fine pipette tip. Do not exceed 5 minutes of total drying time.
7. Immediately remove the samples from the magnet plate and resuspend beads in 50 µl of Buffer EB by pipetting thoroughly to elute the DNA. Incubate for 2 minutes after resuspending.
8. Place samples on magnet plate for 3 minutes to separate beads from solution.
9. Without disturbing the beads, transfer 45 µl of each sample to a new PCR plate or tube.
10. ***For long-term storage, keep samples at -20°C.***

VII. Quantification and QC analysis of TargetRich™ libraries

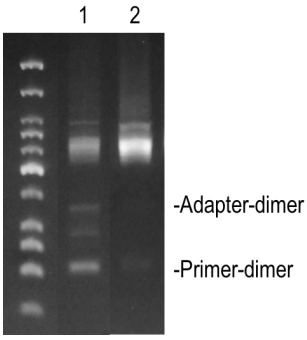
1. Use a fluorometric DNA quantification assay, such as the Qubit® system (Life Technologies®), to determine the concentration of each sample. *Typical library concentrations for this panel range from 0.6 - 3.0 ng/µl and are dependent upon the quality and input amount of template DNA.*

2. Combine the libraries (excluding the negative control) such that all samples are present in equimolar amounts. For example, pool 10 ng of each library.

3. Normalize the pooled library to 10 nM using Buffer EB
   Typical amplicon sizes for this panel are in the range of 250 - 350 bp. A 10 nM library concentration is achieved by diluting the pooled library to approximately ***1.1 ng/µl*** *as measured by Qubit.* To assess the quality of the pooled library, we suggest running on a 2% agarose gel.



20 ng of PGx Complete library enriched from human buccal swab DNA and resolved on a 2% agarose EX E-Gel (ThermoFisher Scientific, Cat# G401002). Low molecular weight ladder (NEB, Cat# N3233L)



TROUBLESHOOTING NOTE: The presence of adapter-dimers, running as a 130 bp band, and/or primer-dimers, running as a 60 bp band, may be observed in libraries prepared from low-input or low-quality template DNA (lane 1). In this case, an additional round of Ampure bead purification using a 1:1.2 DNA to bead ratio can be performed to remove dimers from the final pooled library (lane 2: library after bead purification with 1:1.2 DNA to bead ratio).

VIII. Sequencing TargetRich Libraries

The pooled and normalized PGx libraries are now ready for sequencing on an Illumina MiSeq. Refer to the Kailos TargetRich UMI/Index Adapters & Sequencing User Manual for directions on denaturing the pooled library and setting up the sequencing run.

Kailos Genetics' General Terms and Conditions of Sale

1. Contract Terms. These are the contract terms and conditions ("Terms") under which our which our products and services are provided. These Terms, together with our quotation (if any), create the contract ("Contract") between the parties for the purchase, sale and use of products and/or services. The Contract between us is created when any one of the following is deemed to have occurred: (i) an order is received, (ii) payment for any part of an order is received, (iii) any part of an order is delivered, (iv) the box containing the product is opened, or (v) the product or service is used. If any conditions within the Contract documents conflict with each other, we will give them the following priority: the quotation then these Terms.

2. Delivery, Title and Ordering

2.1 We will try to meet the delivery dates specified in your order, depending on availability and any lead times that may apply. Sometimes orders are delivered in installments. If orders are delivered in installments, a separate invoice will be provided for each delivery.

2.2 Once an order has been placed and accepted, it cannot be cancelled**.** If delaying the date of delivery would be helpful, please contact Customer Services to see if we can reschedule your delivery.

2.3 All our products are sold FOB our facility. Products are deemed delivered when accepted by any commercial carrier at our facility. At this point you become responsible for risk of loss and damage. If any product is lost or damaged while being transported, we will try to help you in dealing with the carrier. We do not clear products for import into any country. Doing so is solely your responsibility. Title to products will pass to you upon receipt of product by the carrier.

3. Inspection.

3.1 We want you to receive any product in satisfactory condition. Products that are damaged or defective upon on delivery may be returned for replacement, if you contact Customer Services within 5 business days from the date of product receipt. When contacting Customer Service, you will be provided instructions for returning the products and replacement. If you do not contact us within this five-day period, the products will be deemed accepted, but you will not lose any warranty rights.

3.2 Custom products made in accordance with your specifications can only be returned if the custom product does not conform to specifications. In any such case, we will, in our sole discretion, either replace the product or issue a refund for an amount not to exceed the price paid for the product.

4. Price. The price for products and services is shown in our quotation to you. If we do not provide you with a quotation, the price will be the list price that applies to your country on the date the order is received. Our prices do not include any taxes (including VAT), duties, levies or other government fees that may apply to your order. If applicable, payment of any taxes, duties, levies or other government fees are your responsibility. If paid by us, the cost will be added to your invoice. You are also responsible for standard delivery and handling charges for each shipment, if any. These charges will be added to your invoice.

5. Payment. Invoices, unless specified otherwise in the quotation, are due within 30 days from the invoice date in the currency specified in our invoice. Each order is a separate transaction, and you may not set-off payments from one order against another. If you are late in making payment, without affecting our other rights, we may suspend delivery or cancel the Contract, reject your future orders, and charge you a late-payment charge, from the due date until paid, at the rate of one percent (1%) per month (12% per year) or, if less, the maximum amount allowed by law. You agree to pay this late charge when demanded. If we appoint a collection agency or an attorney to recover any unpaid amounts, we can charge you and you agree to pay all reasonable costs of collection, including all associated reasonable attorneys' fees.

6. Product Use and Restrictions.

6.1 All products are for RESEARCH USE ONLY, AND NOT FOR HUMAN OR ANIMAL THERAPEUTIC OR DIAGNOSTIC USE. Products are to be used in accordance with our instructions, and you may not purchase products with the intention of reselling them or otherwise act as a distributor of our products. We do not submit our products for regulatory review by any government body or other organization, and we do not validate them for clinical, therapeutic or diagnostic use, for safety and effectiveness, or for any other specific use or application. You are solely responsible for making sure that the way you use our products complies with applicable laws, regulations and governmental policies. You must obtain all necessary approvals, intellectual property rights, licenses and permissions you may need. It is solely your responsibility to make sure the products are suitable for your particular use. If you are looking for commercial use rights to our products (including the right to perform fee-for-services), please contact our outlicensing department at licensing@kailosgenetics.com.

7. Custom Products.

7.1 When you ask us to manufacture a custom product, we may decline the design or manufacture of such custom product, at any stage of the design or manufacture process, if the custom product is unsuitable or commercially impractical to be synthesized in that way. If that is the case, we will notify you as soon as possible and you will not be obligated to pay any fees for any expenses incurred by us in connection with a declined product unless specifically stated in our quotation.

7.2 By submitting an order for a custom product you represent and agree that (a) you have provided us with all information that you are aware of regarding any biological, radiological and chemical hazards associated with the handling, transport, exposure or other usage of the materials you supply to us; and (b) you have the right to cause the sequences that you requested us to manufacture to be manufactured.

8. Intellectual Property

8.1 You acknowledge that all intellectual property rights relating to our products and services, as between you and us, are solely and exclusively owned by us. Our sale of products to you only grants you a limited, non-transferable right, for only you to use the quantity of the products that you have received from us in accordance with the Contract. When we provide products to you, we do not grant you a license to our intellectual property, whether express, implied, by estoppel or otherwise, or grant you the right to make or have made any product or to use the product beyond the scope of this agreement. Nothing in the Contract limits our ability to enforce our intellectual property rights.

8.2 In relation to processes, methods or related synthesis of a custom product, or otherwise in connection with the design or manufacture of a custom product, any inventions (patentable or otherwise), discoveries, improvements, data, know-how or other results that are conceived, developed, discovered, reduced to practice, or generated by or for us, or jointly by us and you, will be and will remain our sole and exclusive intellectual property, and you transfer and assign all of your right, title and interest in and to any such joint intellectual property to us and assist us, at our request and at our expense, in securing and recording our rights in such intellectual property.

9. Intellectual Property Indemnity

9.1. Our Indemnity of You. We will defend and indemnify you from and against infringement damages finally awarded in any legal action brought by a third party against you to the extent that the action is based on a claim that our manufacture and sale of a product infringes any patent, copyright, trademark or other intellectual property right of such third party if we had actual knowledge of such intellectual property right and the actual infringement at the time of delivery of the product to you. This indemnity does not apply to products that we made, assembled or labeled in reliance upon your instructions, specifications, or other directions, or to claims based on your use or resale of products, or to modifications made by you or any third party. This indemnity does not apply to products originating from third parties. THIS INDEMNITY IS OUR ONLY LIABILITY TO YOU, AND YOUR ONLY REMEDY, FOR ANY INFRINGEMENT OR CLAIMED INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS BY OR IN CONNECTION WITH ANY PRODUCT. As a condition to this indemnity, you must (i) notify us in writing, as soon as you become aware of any claim; (ii) not admit any liability or take any other action in connection with the claim that could affect the defense; (iii) allow us to solely control the defense or settlement of the claim; and (iv) give us your reasonable information, co-operation and assistance.

9.2 Your Indemnity of Us. If a third party makes a claim against us for infringement of its intellectual property rights based on our manufacture or sale of a product we make under your instructions, specifications, directions, installation, assembly, or using materials you provide to us, or based on your modification, use or resale of a product, then you will indemnify and hold us harmless from and against any and all claims, losses, damages, liabilities and expenses (including reasonable attorneys' fees and other costs of defending and/or settling any action) that we may have to pay as a result of the claim.

9.3 Avoidance. We wish to avoid claims of intellectual property infringement. If we believe a product may be subject to a claim for intellectual property infringement, then you will allow us, at our option and expense, to either: (a) secure for you the right to continue using the product; (b) substitute the product with another suitable product with similar functionality; or (c) require you to return the product to us for a refund of the purchase price you paid.

10. Limitations of Liability.
10.1 TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, WE WILL NOT BE LIABLE UNDER ANY LEGAL THEORY (INCLUDING BUT NOT LIMITED TO CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR WARRANTY OF ANY KIND) FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, MULTIPLE, EXEMPLARY OR CONSEQUENTIAL DAMAGES (INCLUDING BUT NOT LIMITED TO COSTS OF COVER, LOST PROFITS, LOST DATA, LOSS OF BUSINESS, LOSS OF GOODWILL OR LOSS OF REVENUE) THAT YOU MIGHT INCUR UNDER THE CONTRACT, OR THAT MAY ARISE FROM OR IN CONNECTION WITH OUR PRODUCTS OR SERVICES, EVEN IF WE HAD NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. IN ADDITION, OUR MAXIMUM AGGREGATE LIABILITY ARISING OUT OF OR IN CONNECTION WITH THE CONTRACT, OR ANY PRODUCT OR SERVICE, IS LIMITED TO THE AMOUNT YOU PAID TO US FOR THE PRODUCT OR SERVICE PURCHASED. HOWEVER, THESE PROVISIONS DO NOT LIMIT OUR LIABILITY FOR DEATH OR PERSONAL INJURY CAUSED BY OUR NEGLIGENCE OR FRAUD, FRAUDULENT MISREPRESENTATION OR ANY OTHER LIABILITY THAT CANNOT BE EXCLUDED BY LAW.
10.2 DELIVERY DATES AND TIMES ARE ESTIMATES ONLY AND WE WILL NOT BE LIABLE (IN CONTRACT, DELICT, TORT OR OTHERWISE) FOR ANY LOSSES, EXPENSES, CLAIMS OR DAMAGES CAUSED BY A LATE DELIVERY.

11. Export Control. Products and information that you receive from us are subject to United States, European Union and local export-control laws and regulations. You may not, directly or indirectly, sell, export, re-export, transfer, divert, or otherwise dispose of any such product or information (including products derived from or based on our products or information) to any destination, entity, or person prohibited by United States, European Union or local laws or regulations.

12. Entire Contract.
12.1 The Contract represents the entire agreement between you and us regarding the products and services we provide to you under it, and supersedes and replaces any previous agreements between us (whether written or oral). Any of your additional or different terms and conditions that you may provide to us, are material alternations and we reject them. Our offer to sell products and perform services is expressly limited to the terms of the Contract. If you submit a purchase order, or other document for the purchase of products or services, whether or not in response to a quotation, you are deemed to have accepted and agree to the Contract, to the exclusion of (a) any other terms and conditions appearing in or referenced in your purchase order or other documents you give to us, and (b) any previous course of dealing, course of performance, trade usage or co-existent agreement. The Contract cannot be amended or modified unless you and we agree in writing.
12.2 We reserve the right to change these Terms at any time. Any changes made to these Terms will not apply to the Contract between us for any order we receive before the changes are made. The most recent revision date can be found at the end of these Terms

13. Miscellaneous.
13.1 We will not be responsible or liable for failing to perform our obligations under the Contract to the extent caused by circumstances beyond our reasonable control. In certain situations, we may use our reasonable judgment and apportion products then available for delivery fairly among our customers.
13.2 Our failure to exercise any rights under the Contract is not a waiver of our rights to damages for your breach of contract and is not a waiver of any subsequent breach. If any provision or part of the Contract is found by any court of competent jurisdiction to be invalid or unenforceable, such invalidity or unenforceability will not affect the other provisions of the Contract. No person other than you or us will have any rights under the Contract. Headings are for convenience only and shall not be used in the interpretation of these Terms.
13.3 You agree to keep confidential any non-public technical information, commercial information (including prices, without limitation) or instructions (including any gene sequences, oligo types or sequences) received from us as a result of discussions, negotiations and other communications between us in relation to our products or services.

14. Governing Law. The Contract and performance under it will be governed by the laws of the State of Delaware, USA, without regard to provision on the conflict of laws. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to the Contract.

Learn More

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- TargetRich Panels,
- Blue Analytics,
- Blue Reporting Solutions and
- Kailos' Laboratory Services

visit www.kailossolutions.com

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support@kailosgenetics.com

Appendix A: PGx Reference Materials

Validation

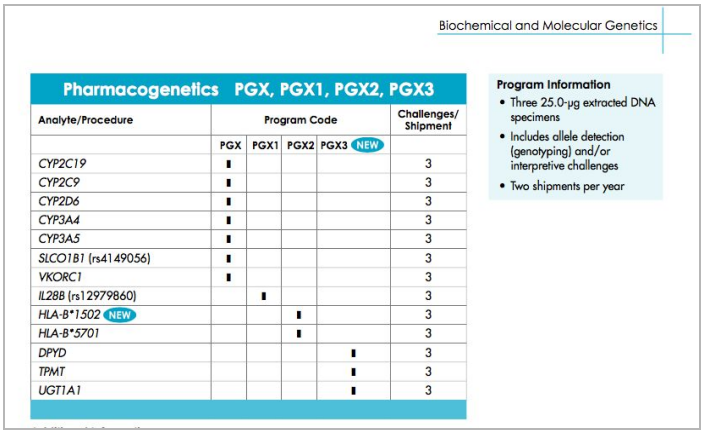
The Genetic Testing Reference Materials Coordination Program[1] (GeT-RM) is organized by the Center for Disease Control and Prevention to help the genetic testing community obtain reference materials. All Get-RM materials have been tested in several independent laboratories using a variety of methods.

Data on the pharmacogenetics reference materials with listings of variants and methodologies utilzed can be accessed here: https://wwwn.cdc.gov/clia/Resources/GetRM/pdf/GeT-RM%20one%20pager7-29-15pdf.pdf

The cell lines and DNA are available through commercial vendors. To place orders, access the Excel data files at the GeT-RM website. Included in each file is a column listing the vendor (ie Coriell, ATCC, etc) catalog number for ordering cell lines or DNA for evaluation.

Proficiency Testing

The College of American Pathologists[2] (CAP) provides proficiency testing programs for pharmacogenetic tests. Reference PGX, PGX1, PGX2 and PGX3 in the current catalog.



Biochemical and Molecular Genetics

Pharmacogenetics PGX, PGX1, PGX2, PGX3

Analyte/Procedure	Program Code				Challenges/ Shipment
	PGX	PGX1	PGX2	PGX3 NEW	
CYP2C19	▮				3
CYP2C9	▮				3
CYP2D6	▮				3
CYP3A4	▮				3
CYP3A5	▮				3
SLCO1B1 (rs4149056)	▮				3
VKORC1	▮				3
IL28B (rs12979860)		▮			3
*HLA-B*1502* NEW			▮		3
*HLA-B*5701*			▮		3
DPYD				▮	3
TPMT				▮	3
UGT1A1				▮	3

Program Information
- Three 25.0-µg extracted DNA specimens
- Includes allele detection (genotyping) and/or interpretive challenges
- Two shipments per year

Current CAP Proficiency Testing Catalog: http://www.cap.org/web/home/lab/catalogs-ordering-shipping?_adf.ctrl-state=kswp0cnni_17&_afrLoop=6270866870933#!

[1] https://wwwn.cdc.gov/clia/Resources/GetRM/pdf/GeT-RM%20one%20pager7-29-15pdf.pdf
[2] http://www.cap.org/web/home?_adf.ctrl-state=kswp0cnni_17&_afrLoop=6550149599938#!