

Automated  
nucleic acid  
isolation.

revvity



chemagic™ 360 nucleic acid extractor



# Flexible, automated, high-throughput DNA and RNA isolation

With dimensions of only 80 x 80 cm and its unique sample volume flexibility, the chemagic™ 360 instrument represents the ideal solution for nucleic acid isolation in human genetics, biobanking, HLA typing, viral and bacterial detection.

Experience the revolutionary compact benchtop design of our well established chemagic 360 instrument. Based on the patented chemagic Magnetic Bead Technology, the system offers a flexible solution for different sample processing and throughput needs. Configurable with three kinds of chemagic Rod Heads the system can process sample volumes from 10 µl - 10 ml (see table on page 3). To support your automation needs, the system is equipped with the chemagic Software and the chemagic 360 Dispenser Unit. These allow LIMS-compatible bar code reading/sample tracking and automated buffer filling for all volume applications. Due to its modular set up, the chemagic 360 Instrument can be integrated with standard liquid handling units.

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For research use only.  
Not for use in diagnostic procedures.

**2024-0020 chemagic 360 instrument**  
**2024-0010\* chemagic 360-D instrument\***





## Key features

- Sample volumes from 10 µl - 10 ml
- High throughput
- Huge kit portfolio
- No cross contamination
- Various sample materials in one run
- Integrates with liquid handling platforms

## Benefits

- Compact design (80 x 80 x 90 cm) (L/W/H)
- Convenient and improved sample management
- Intuitive Software
- Bar code reading for sample tracking
- LIMS compatible log files
- Patented technology and kits



*chemagic 12 Rod Head*



*chemagic 24 Rod Head*



*chemagic 96 Rod Head*

Product name	Product number	No. of samples	Sample volumes	Tubes / Plates	Processing time
chemagic 360 12 Rod Head Set	CMG-371	1 - 12	0.5 ml - 18 ml	50 ml tubes	e.g. for 10 ml blood ~ 55 min
chemagic 360 24 Rod Head Set	CMG-376	1 - 24	200 µl - 10 ml	24 well plates XL	e.g. for 4 ml blood ~ 55 min
chemagic 360 96 Rod Head Set	CMG-370	1 - 96	10 µl - 1.5 ml	96 well plates	e.g. for 400 µl blood ~ 55 min or for 96 swabs ~ 31 min

# chemagic 360 configuration

## chemagic Software

The intuitive chemagic Software is the ideal solution for laboratories who require high quality assurance while they use the chemagic 360 instrument for nucleic acid isolation. For ease of operation and advanced QA needs the chemagic software generates log files, which can be easily integrated in LIMS systems.

### Features at a glance:

- Bar code reading/sample tracking
- LIMS compatible log files
- Easy navigation and set up
- Pre-installed protocols
- Tracking the progress of a running protocol



While running a protocol, the protocol status shows within the main window of the chemagic software the running time, remaining time and the actual protocol step enabling the complete tracking of the process.



# Magnetic bead based nucleic acid isolation

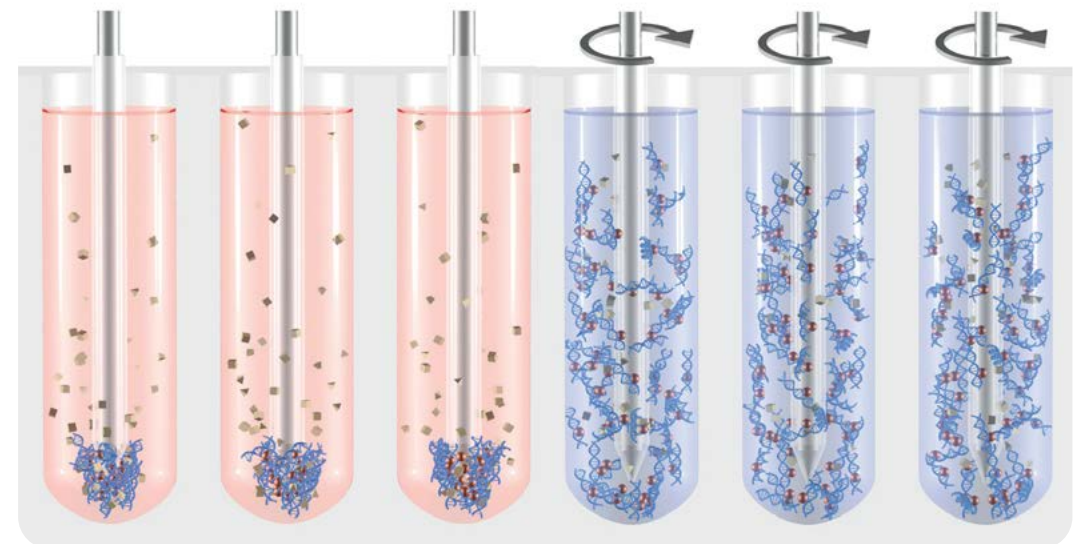
## Magnetic Separation

The magnetic separation is based on the use of metal rods that are lowered into a process solution (A). To collect beads from the solution, the rods are magnetized. Pellets form at the tips of the rods, and the rods are withdrawn from the solution with the pelleted beads attached.

Resuspension into the next process solution, for example, wash or elution buffer, is achieved by switching off the magnetism while rotating the rods (B). This normally difficult step is thus performed quickly and thoroughly, resulting in isolation products with high yields and purities.

## Unique property of the chemagic separation process

- The transfer of magnetic beads instead of liquids ensures no cross contamination of the samples during the isolation process.
- Smooth and efficient resuspension technology ensures the isolation of long DNA fragments up to 200 kb.



(A) Magnet on - Rotation off

(B) Magnet off - Rotation on



# chemagic 360 configuration

## chemagic 360 Dispenser Unit

The use of the chemagic 360 instrument simplifies and improves time consuming sample preparation steps in nucleic acid isolation significantly, by using the chemagic 360 Dispenser Unit. Independent of the amount of needed buffer, the additional unit prefills tubes/plates quickly and accurately. Variants of the chemagic 360 Dispenser Unit are available to suit the corresponding chemagic Rod Head formats (12 and 24/96).

### Features at a glance:

- Reduces hands-on time
- Cost-efficient through optimal buffer dispensing
- Fast and reliable membrane pump technology
- Fully integrated in the chemagic 360 software



### chemagic 360 Portrait Dispenser Kit

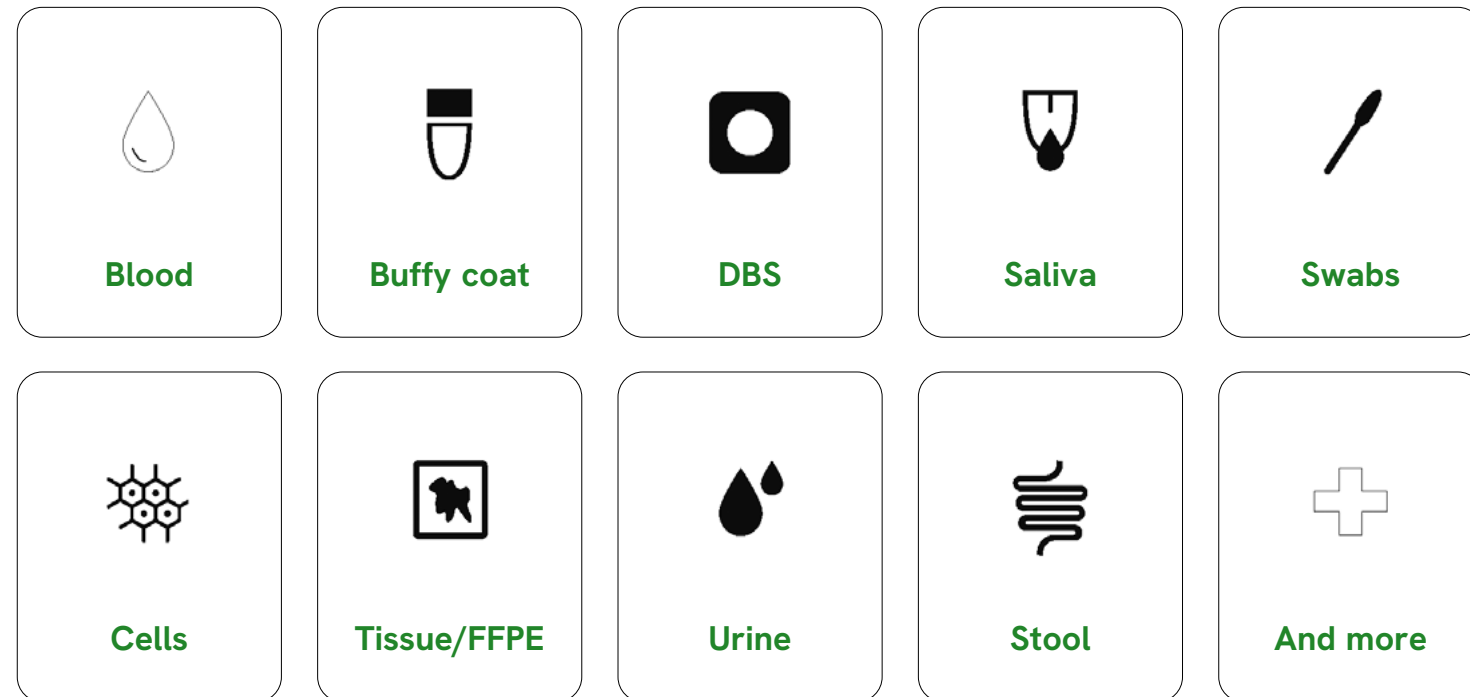
The chemagic 360 Portrait Dispenser Kit enables the filling of buffers in portrait direction instead of land-scape using the general chemagic 360 Dispenser Unit. The advantage of the portrait filling is the simplified integration with liquid handlers which generally pipette in portrait format (8, 16, 24, etc.).

**Product number: CMG-13005658**

# Workflows with chemagic kits

The chemagic kit portfolio comprises a large amount of kits for the isolation of genomic DNA, cfDNA, total RNA, viral and bacterial nucleic acids from a variety of sample materials. Here, it is presented a small selection of available kits.

## Sample type agnostic - chemagic nucleic acid isolation solutions





# Automated DNA and RNA purification from blood

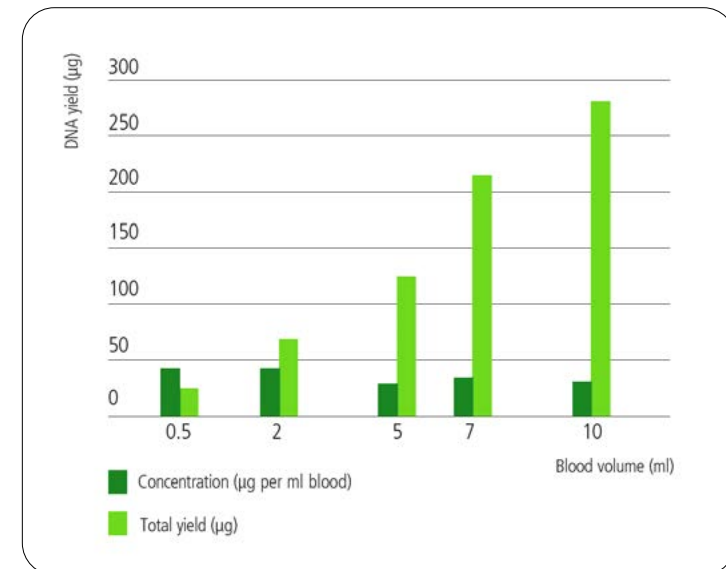
The fast and efficient isolation of nucleic acids from whole blood samples represents a critical bottleneck for downstream genomics applications. The variability of recovery rates, the presence of impurities as well as molecular degradation directly impact the ability to generate high quality data for genetic research. Revvity's DNA and RNA purification workflows offer the perfect solution to these challenges by combining dedicated instruments and kits designed to obtain high yields of ultra-pure nucleic acids from blood samples.



In comparison to other DNA isolation methods, our technology does not show a “drop” in yield when isolating DNA from increasing blood volumes; therefore a linear increase of total yield ( $\mu\text{g}$ ) according to the corresponding sample volume can be observed. The typical DNA concentration obtained from a healthy donor is 20 - 40  $\mu\text{g}$  per ml blood.

## Legend

- 0.5 ml blood (average value from 50 samples)
- 2 ml blood (average value from 2,000 samples)
- 5 ml blood (average value from 1,500 samples)
- 7 ml blood (average value from 1,200 samples)
- 10 ml blood (average value from 2,000 samples)



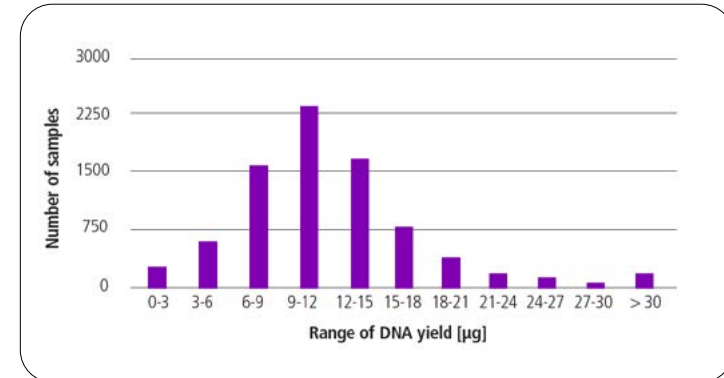




### Genomic DNA from 400 µl whole blood

Genomic DNA was purified from a total of 7,969 whole blood samples using the chemagic DNA Blood 400 Kit H96 on the chemagic 360 instrument. An average high-quality DNA yield of 12.0 µg was obtained, but the DNA yield ranged from 0 - 92.3 µg per sample.

*Kindly provided customer data*

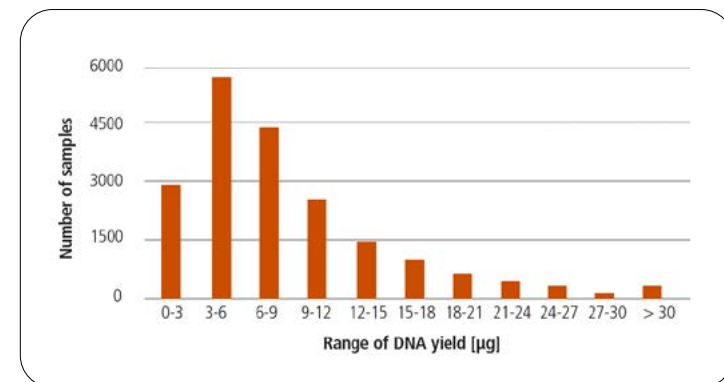


### Genomic DNA from 600 µl saliva

The chemagic kit portfolio includes kit solutions for a wide range of sample materials. Here, we show one example for the processing of saliva with the chemagic Saliva 600 Kit H96 (Prod. no. CMG-1037) using the chemagic 360 instrument.

High-quality DNA was purified from a total of 18,585 saliva samples. The DNA yield ranged from 0 - 140.2 µg, but an average yield of 8.1 µg genomic DNA was obtained.

*Kindly provided customer data*





Product no.	Kit name	chemagic Rod Head	Format	Preps/Kit	Input	Typical yield	Standard elution volume
CMG-1097	chemagic DNA Blood 2k Kit H24	24	24 well	240	≤ 2 ml blood	30 - 80 µg	300 - 500 µl
CMG-1074	chemagic DNA Blood 4k Kit H24	24	24 well	240	≤ 4 ml blood	60 - 200 µg	300 - 500 µl
CMG-717	chemagic DNA Blood 200 Kit H96	96	96 well	960	≤ 200 ml blood	4 - 8 µg	50 - 200 µl
CMG-1091	chemagic DNA Blood 400 Kit H96	96	96 well	960	≤ 400 ml blood	12 - 16 µg	150 µl
CMG-718	chemagic DNA Universal Kit H96	96	96 well	960	≤ 400 µl blood, ≤ 500 µl buffy coat, ≤ 600 µl saliva, stool* and FFPE* samples	12 - 16 µg (400 µl blood), 20 - 50 µg (500 µl buffy coat)	150 - 250 µl

In case you need to process other sample materials, please contact our Technical Support Team to find the optimal kit solution for your workflow.

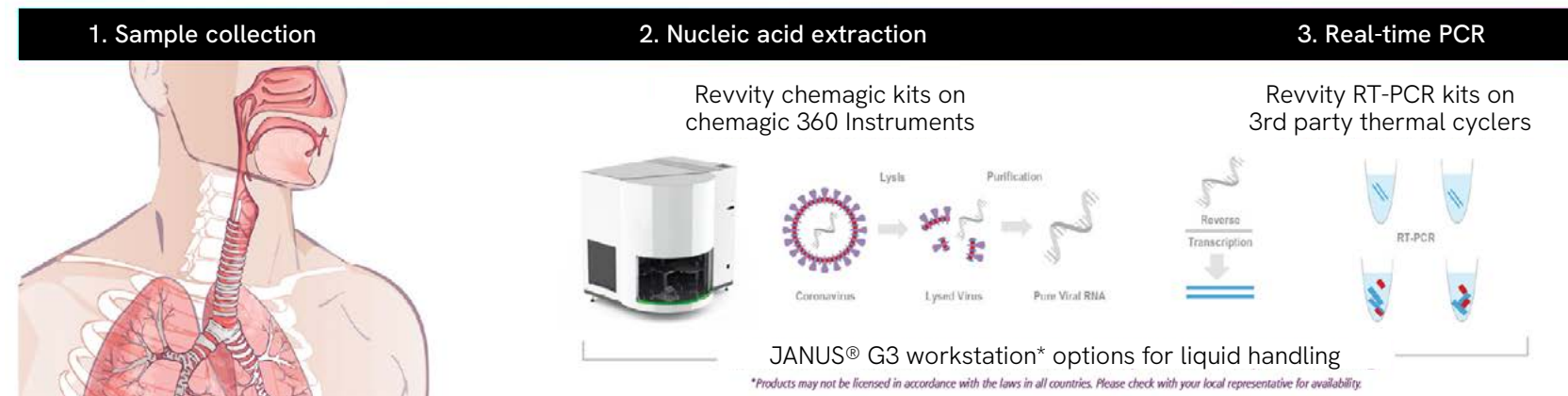


# Automated DNA and RNA purification from pathogens

The Revvity workflows for automated DNA and RNA purification from pathogens are designed for laboratories requiring high yields of DNA and RNA from large numbers of samples. Depending on the needs of your lab, Revvity solutions can include the automated transfer of primary samples to plates compatible with the nucleic acid extraction unit, and optional automated PCR setup to streamline sample analysis.



## Workflow for PCR based analysis of pathogens (e.G., SARS-CoV-2 detection)





We are using Revvity chemagic 360 (Automated Nucleic Acid Extraction system) installed in our laboratory for COVID-19 testing. We are running 32 min. short protocol (recently updated by the Revvity Team) and getting good result with our RT PCR. Due to this short protocol we are able to run approx. 4000 samples / day with two instruments. The instrument supplied has been functioning well, satisfying the requirements of our applications and meeting our expectations for quality and reliability.

*Department of Microbiology, Government of Rajasthan, S.M.S Medical School, Jaipur*

	1	2	3	4	5	6	7	8	9	10	11	12
A	16,92	undet	16,73	undet	17,44	undet	16,58	undet	16,65	undet	16,63	undet
B	undet	16,49	undet	16,83	undet	16,99	undet	16,78	undet	16,93	undet	16,74
C	16,57	undet	16,96	undet	16,85	undet	16,94	undet	16,74	undet	17,13	undet
D	undet	16,87	undet	16,64	undet	17,45	undet	17,59	undet	17,18	undet	16,98
E	16,68	undet	16,92	undet	17,65	undet	17,53	undet	16,85	undet	16,94	undet
F	undet	17,39	undet	17,01	undet	17,04	undet	17,16	undet	16,89	undet	16,71
G	16,92	undet	16,73	undet	17,44	undet	16,58	undet	16,65	undet	16,63	undet
H	undet	16,70	undet	16,79	undet	16,77	undet	17,04	undet	15,47	undet	17,02

*No cross-contamination are visible tested with 5 µl ultrapure water and 5 µl HSV direct control on chemagic 360 instrument.*



*ultrapure water*



*5 µl HSV positive direct control*

#### References

Mackay, M.J., Hooker, A.C., Afshinnekoo, E. et al. The COVID-19 XPRIZE and the need for scalable, fast, and widespread testing. Nat Biotechnol (2020).

Sahajpal NS, Mondal AK, Ananth S, et al. SalivaAll: Clinical validation of a sensitive test for saliva collected in healthcare and community settings with pooling utility for SARS-CoV-2 mass surveillance. medRxiv (2020).

Siedner, M.J., Moorhouse, M.A., Simmons, B. et al. Reduced efficacy of HIV-1 integrase inhibitors in patients with drug resistance mutations in reverse transcriptase. Nat Commun (2020).

**RUO kits**

Product no.	Kit name	chemagic Rod Head	Format	Preps/Kit	Input	Sample material	Standard elution volume
CMG-1049	chemagic Viral DNA/gDNA 200 Kit H96	96	96 well	960	≤ 200 µl	Body fluids, swabs	50 - 100 µl
CMG-1033-S	chemagic Viral DNA/RNA 300 Kit H96	96	96 well	960	≤ 300 µl	Swabs, saliva, sputum, BAL, serum, or plasma	50 - 100 µl
CMG-1131	chemagic Body Fluid 1k Kit H96	96	96 well	960	500 - 1000 µl	Body fluids, swabs	50 - 100 µl
CMG-1033-P	chemagic Pathogen NA Kit H96	96	96 well	960	≤ 300 µl	Swab transport media, lysate from swabs, yeast culture	50 - 100 µl

**IVD kits**

Product no.	Kit name	chemagic Rod Head	Format	Preps/Kit	Input	Sample material	Standard elution volume
IVD-1033-S*	chemagic Viral DNA/RNA 300 Kit H96	96	96 well	960	300 µl	Plasma, saliva, or swabs	50 - 100 µl
IVD-1049*	chemagic Pathogen NA gDNA Kit H96	96	96 well	960	200 µl	Blood, plasma, saliva, or swabs	50 - 100 µl
IVD-1049-1000*	chemagic Pathogen NA gDNA Kit H96 XL	96	96 well	960	500 µl, 1000 µl	Blood, plasma, saliva, or swabs	100 - 300 µl

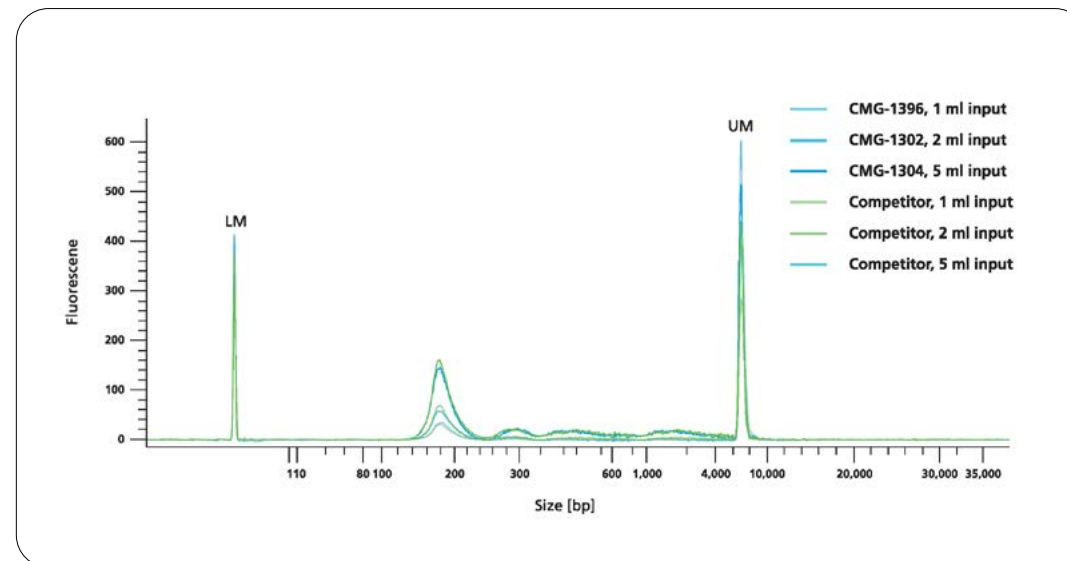
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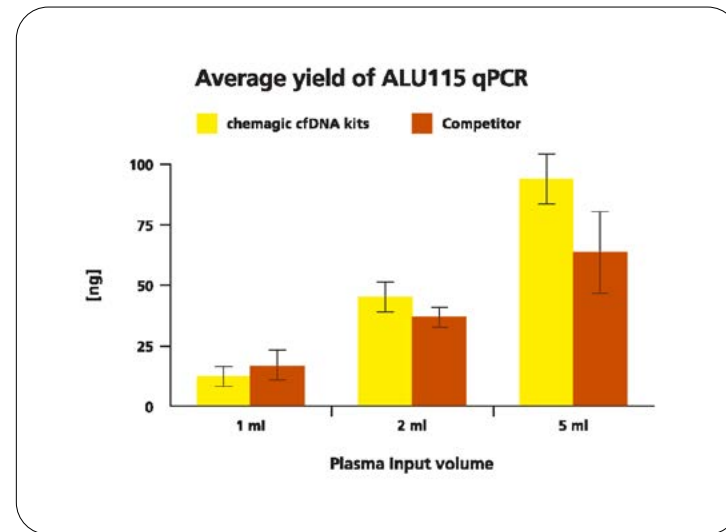
# Automated cfDNA extraction from plasma

The isolation of cfDNA represents a huge challenge due to low concentrations, instability and small fragment sizes and thus causes a high demand for precise cfDNA purification workflows. The Revvity workflow for automated cfDNA purification provides a reliable processing with minimal hands-on time on the chemagic 360 instrument.



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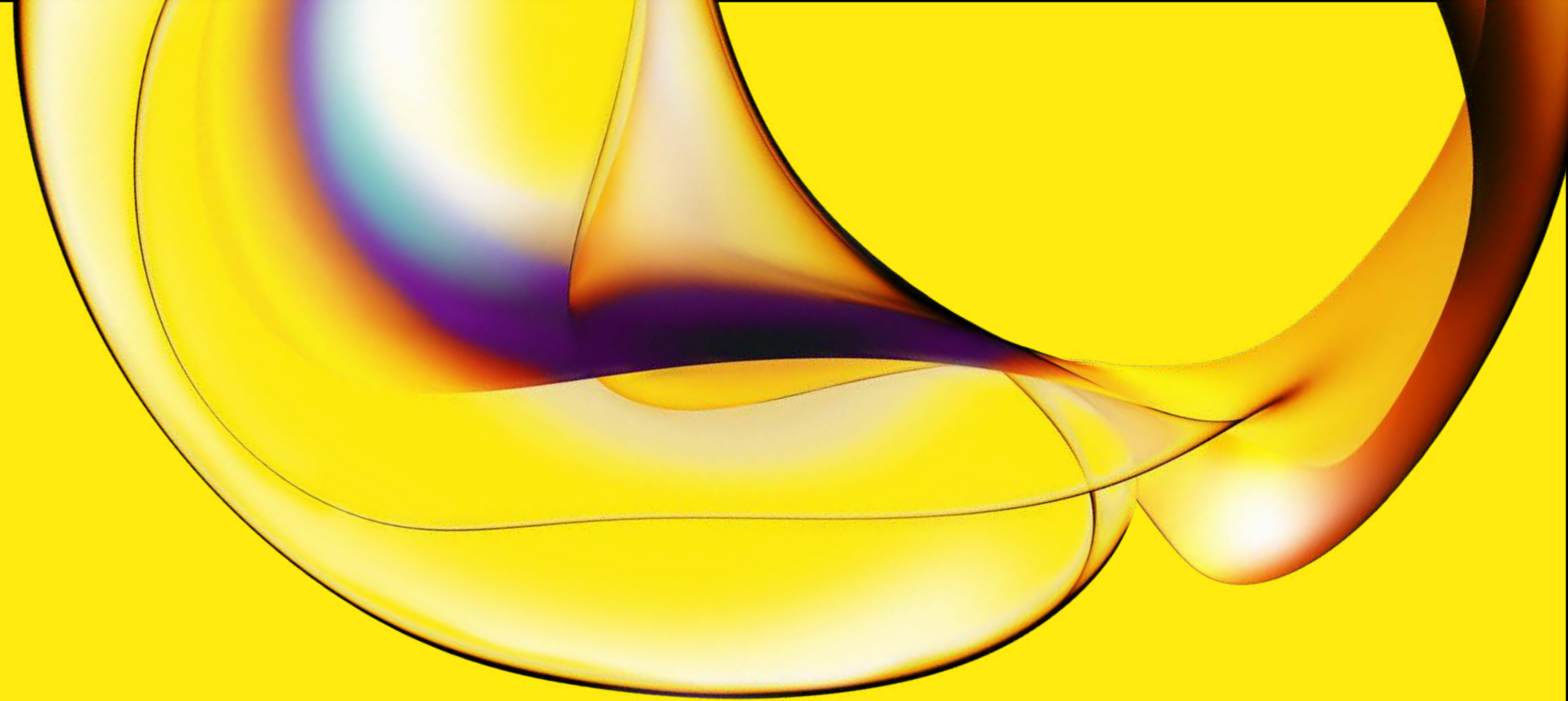


Increasing cfDNA yields with increased sample input. cfDNA was isolated from 1 ml, 2 ml and 5 ml from two different donors both with the chemagic Kits on the chemagic 360 instrument and manually with competitor. For cfDNA analysis, a short fragment (115 bp) from a consensus sequence with abundant genomic ALU repeats was amplified. The exemplary data from donor 2 shows that the yield of cfDNA is scalable to sample input.

#### Reference

Moon SM, Kim JH, Kim SK, Kim S, Kwon HJ, Bae JS, Lee S, Lee HS, Choi MY, Jeon BH, Jeong BH, Lee K, Kim HK, Kim J, Um SW. Clinical Utility of Combined Circulating Tumor Cell and Circulating Tumor DNA Assays for Diagnosis of Primary Lung Cancer. *Anticancer Res.* 2020

Product No.	Kit name	chemagic Rod Head	Format	Preps/Kit	Input	Yield	Processing time
CMG-1304	chemagic cfDNA 5k Kit H24	24	24 well	240	3 - 5 ml	1 - 30 ng/ml plasma (qPCR)	100 min (incl. 15 min hands-on time)
CMG-1302	chemagic cfDNA 2k Kit H24	24	24 well	240	1 - 2 ml	1 - 30 ng/ml plasma (qPCR)	90 min (incl. 15 min hands-on time)
CMG-1396	chemagic cfDNA 1.5k Kit H96	96	96 well	960	0.5 - 1.5 ml	1 - 30 ng/ml plasma (qPCR)	120 min (incl. 15 min hands-on time)



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**Revvity, Inc.**  
940 Winter Street, Waltham, MA 02451 USA  
[www.revivity.com](http://www.revivity.com)

For a complete listing of our global offices, visit [www.revivity.com](http://www.revivity.com)  
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