

# Sa2Res: Fully Integrated Diagnostics System



**Sa2Res**  
Samples to Results



**Sacace**  
BIOTECHNOLOGIES

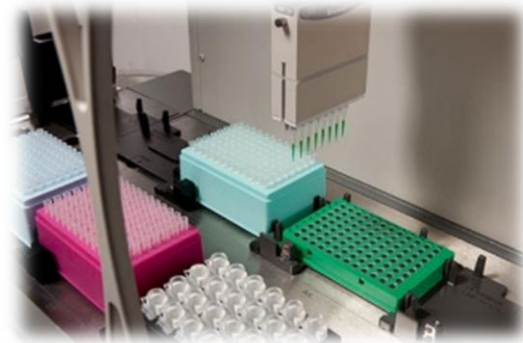
# Sa2Res™

*3 products in one*



**Real Time PCR**

+



**Liquid Handler**

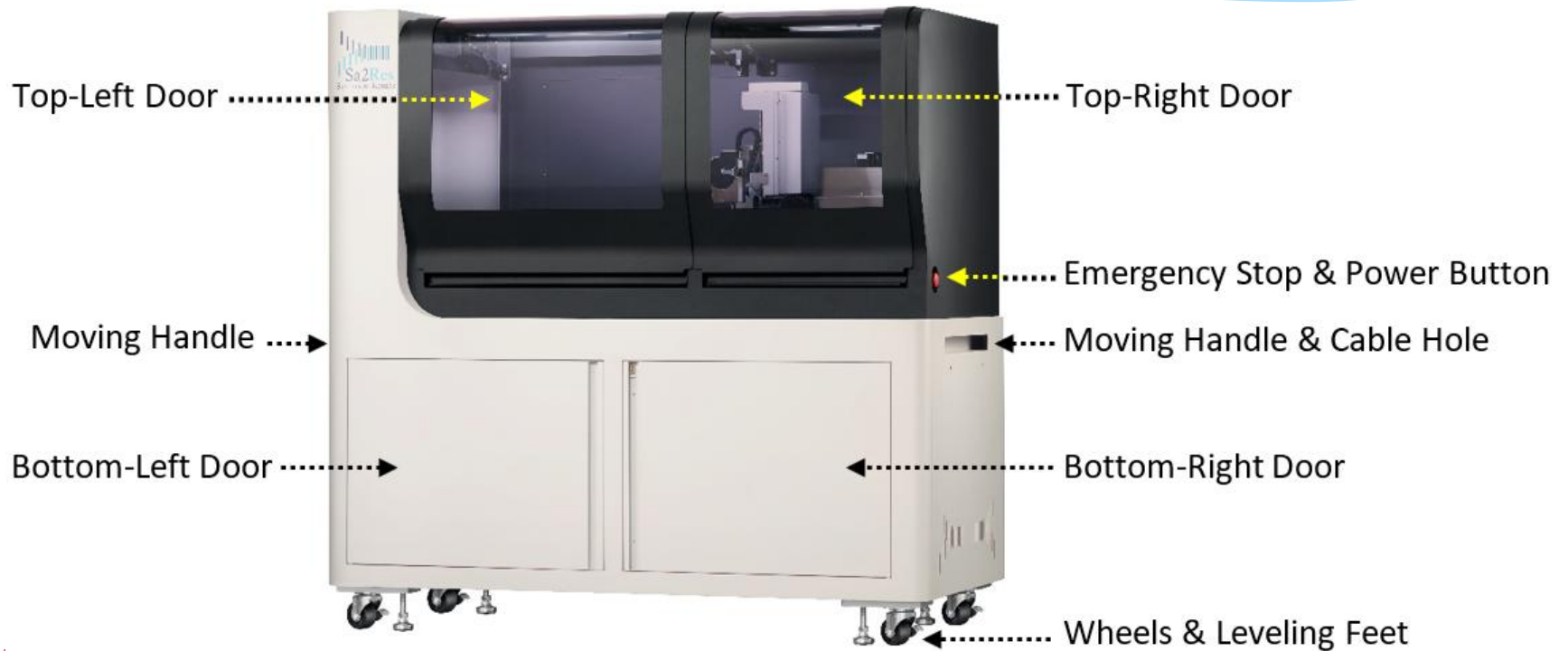
+



**DNA/RNA auto extractor**

# Sa2Res™ Features

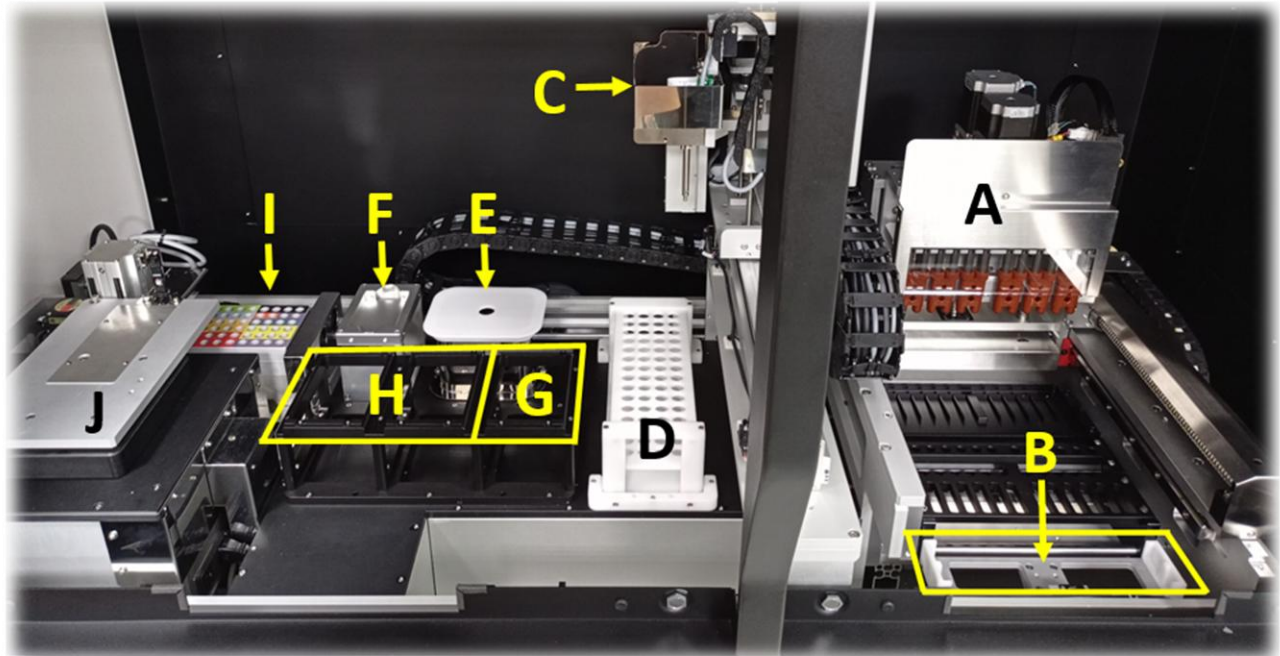
## *External overview*



# Sa2Res™ Features

## *Internal overview*

- A** : Nucleic Acid Extraction Module
- B** : Sample Tube Rack Holder
- C** : Liquid Handling Module
- D** : Rack for Primary Samples
- E** : Waste Bin
- F** : PCR Caps Holder
- G** : Holder for 1000  $\mu$ l Tips
- H** : Holder for 200  $\mu$ l Tips
- I** : Cooling Area for PCR Reagents
- J** : qPCR Module



# Sa2Res™ Features

## *Accessories included*

### Primary Sample Racks

3 ml **x 1**

9 ml **x 1**



3 ml rack compatible also with standard swab tubes

### Sample Tube Racks

0.2 ml **x 1**

1.5 ml **x 1**



0.2 ml rack for qPCR  
lyophilized formats like HCV  
Dx and HBV Dx  
1.5 ml rack for liquid format

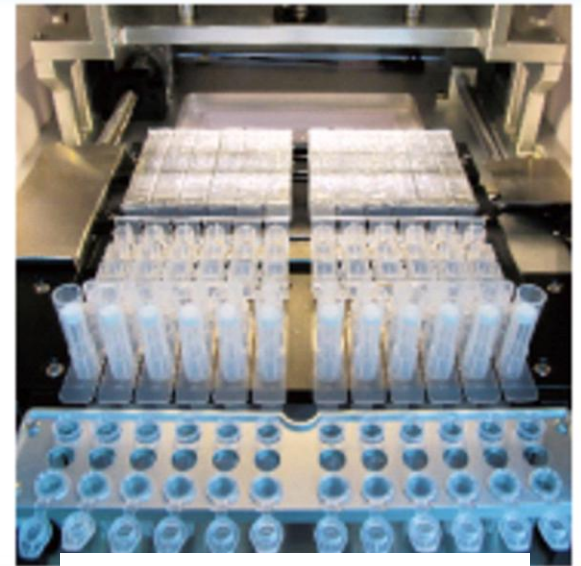
### Holder Lid **x 1**



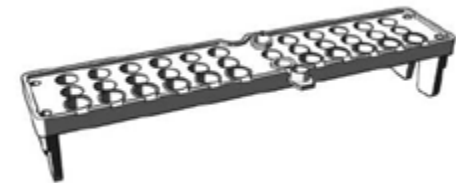
### Barcode Reader **x 1**



# Sa2Res™ Extraction module



Special rack For 0,2 ml PCR tube  
(HCV/HBV DX lyophilized kits)



Standard rack For 1,5 ml  
elution tubes

# Sa2Res™ Extraction module

**Magnetic  
Beads based  
technology**



## POLYGON REACTION CHAMBER

Ensure highest efficiency of lysis and elution, greatly minimizing the presence of magnetic beads and alcohol residues in the final eluted sample.



# Sa2Res™ Features

*Consumables supported*



**Tecan tips  
1000 µl  
conductive**



**Tecan tips  
200 µl  
conductive**

FROM TECAN



**Sa2Res  
PCR caps**



**Sa2Res  
PCR strips**

FROM SACACE

# Sa2Res™ Features

## *Sa2Res main features*

- Fully **automatic** system
- **One single software** handling DNA/RNA extraction, qPCR setup, qPCR Amplification and Results Analysis
- **Full compatibility** with SaMag-12 extraction reagents
- Barcode reader for **sample traceability**
- **LIS** import and export support
- Support for **primary sample** tubes
- 4 channels **Real Time PCR** multiplexing, up to 4 targets in a single reaction well
- Import **standard curve** from previous runs
- Up to 48 samples/run processed
- ~6 hours for 1 full run
- Refrigerated block for reagents

# Sa2Res™

## Versatility of Assay Type



# Sa2Res™

## Run Set up



**Extraction + Assay Details**

**Assay Setting**

Experiment Name  **use only letters and numbers, no special characters**

**Extraction Setting**

Elution Tube Rack

Select 0.2ml tube rack ONLY for EYD981230 OR qPCR kits

Sample Type

No. of Samples

Extraction Protocol

Extraction Kit Lot No.

Sample Volume  100-100ul

Elution Volume  50-300ul

**qPCR Kit Selection** (GAL)

qPCR Kit	Lot No.
qPCR Kit 1 <input type="text" value="6 STD-1"/>	<input type="text"/>
qPCR Kit 2 <input type="text"/>	<input type="text"/>
qPCR Kit 3 <input type="text"/>	<input type="text"/>
qPCR Kit 4 <input type="text"/>	<input type="text"/>

**qPCR Setting**

Total Reaction Vol. 25 ul

PCR Tube Type 0.2 ml tube

Status administrator/Service for Open  
Sample input Sa2Res  
Extraction + qPCR 20220918A 1.0.0Ver

Temp 25°C  
Remaining Time: 00:00:00  
20/09/2022 09:14:07



Main Menu



Home



Emergency Stop



# Sa2Res™

## Run Set up



Sample ID Input

Please manually enter the sample ID or scan the sample ID barcode

01	1234567
02	2345678
03	3456789
04	4567891



The diagram shows a test tube with a barcode on the left, an arrow pointing to the right, and a test tube with a red liquid level on the right, representing the scanning and processing of a sample.

Back LIS Import Next

Status administrator/Service for Open Tm: 25°C  
Sample ID Input Sa2Res Remaining Time: 00:00:00  
Extraction + qPCR 20220727 1.0.0ver 1/27/2022 2:56:14 PM



Main Menu



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Emergency Stop



Activate Windows  
Settings to activate Windows.

# Sa2Res™

## Run Set up



### qPCR Reagent and Consumables Loading

**1 qPCR Reagent Cooling Block**

	1	2	3	4	5	6	7	8
A	MMx Kit				IC Kit			
B	NCA Kit							
C	PCA1 Kit				NCE Kit			
D								
E								
F								
G								
H								

**2 PCR Caps**

	1	2	3	4	5	6
A						
B						
C						
D						
E						
F						
G						
H						

**3 PCR Tubes**

	H	G	F	E	D	C	B	A
1								
2								
3								
4								
5								
6								

**4 200ul Tips**


**5 1000ul Tips**


**Consumables Required**

200ul Tips	1000ul Tips	PCR Caps
<input type="text" value="0"/>	<input type="text" value="5"/>	<input type="text" value="2"/>

**Buttons:** Back, Auto-Check, Refill 200ul Tips, Refill 1000ul Tips, Refill PCR Caps, Start

**Status:** ada/Service for Open, Sa2Res, 7/21/2022 4:13:06 PM, Tim: 25°C, Remaining Time: 00:00:00



# Sa2Res™

## Run Set up



Batch 1/1

Reagent Cartridge	1	
Reaction Chamber	2	
Piercing Pin	3	
Tip Holder		
Filter Tip	4	
Sample Tube (2 mL)	S	
Elute Tube (1.5 mL)	E	

Back Next

Status: Extraction Consumables Loading  
Extraction + qPCR

ada/Service for Open  
Sa2Res  
20220721B 1.0.0/Ver

Tm: 25°C  
Remaining Time: 00:00:00  
7/21/2022 4:08:37 PM



Main Menu



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Emergency Stop



# Sa2Res™

## Results Analysis



qPCR Test Result

**Efficiency**  
10.8611

$y = -0.9310x + 29.846$   
 $R^2 = 0.6951$

U/ml

Well	Sample ID	Dye	Target	Kit Name	CL	Concentration	Concentration Unit	Qualitative Results
A1*	"NCE"	"FAM"		"k1-HCV"	27.74		"IU/mL"	+
A2*	"CAL2(E)"	"FAM"		"k1-HCV"	27.82		"IU/mL"	+
A3*	null	null		"k1-HCV"	26.15		"IU/mL"	+
A4*	null	"FAM"		"k1-HCV"	26.25		"IU/mL"	+
B1*	"PCE1"	"FAM"		"k1-HCV"	25.16	-	"IU/mL"	+
B2*	null	"FAM"		"k1-HCV"	26.56	-	"IU/mL"	+
B3*	null	"FAM"		"k1-HCV"	26.18	-	"IU/mL"	+
B4*	null	"FAM"		"k1-HCV"	26.98	-	"IU/mL"	+
C1*	"PCE2"	"FAM"		"k1-HCV"	27.26	-	"IU/mL"	+
C3*	null	"FAM"		"k1-HCV"	-	-	"IU/mL"	-
C3*	null	"FAM"		"k1-HCV"	27.13	-	"IU/mL"	+
C4*	null	"FAM"		"k1-HCV"	26.77	-	"IU/mL"	+
D1*	"CAL1(E)"	"FAM"		"k1-HCV"	23.44	-	"IU/mL"	+
D3*	null	"FAM"		"k1-HCV"	-	-	"IU/mL"	-
D3*	null	"FAM"		"k1-HCV"	24.28	-	"IU/mL"	+

Status: administrator/Service for Open      Tm: 25°C  
 qPCR Test Result      Sa2Res      Remaining Time: 00:00:00  
 20220918A 1.0.0Ver      20/09/2022 17:57:47



Main Menu



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Emergency Stop



# Sa2Res™ workflow

## *Extraction part*

Insert Reaction Cartridges



Insert Reaction Chambers



Insert Tip Holder



Put Holder Lid on (arrows facing to the inside)



Put Piercing Pins and Filter Tips into Tip Holder



Place the Sample Tubes onto the Sample Tube Rack



Place Elution Tubes onto the Sample Tube Rack



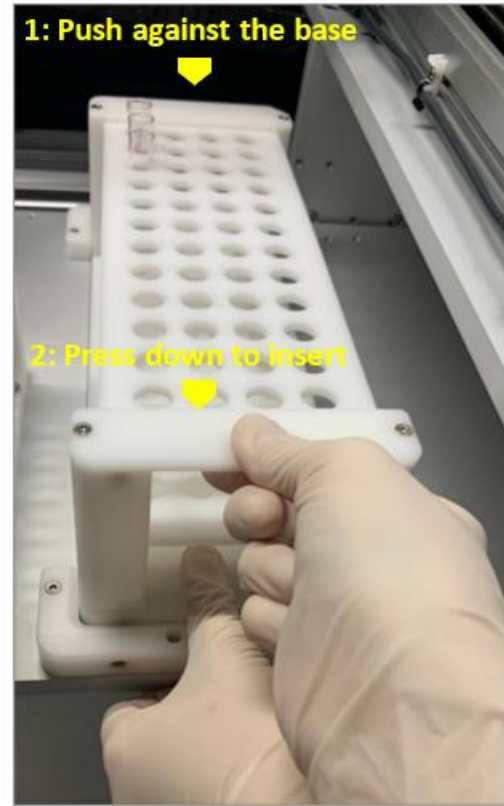
Place the Sample Tube Rack into the extraction module



# Sa2Res™ workflow

## *Sample preparation*

Primary Samples  
Rack



# Sa2Res™ workflow

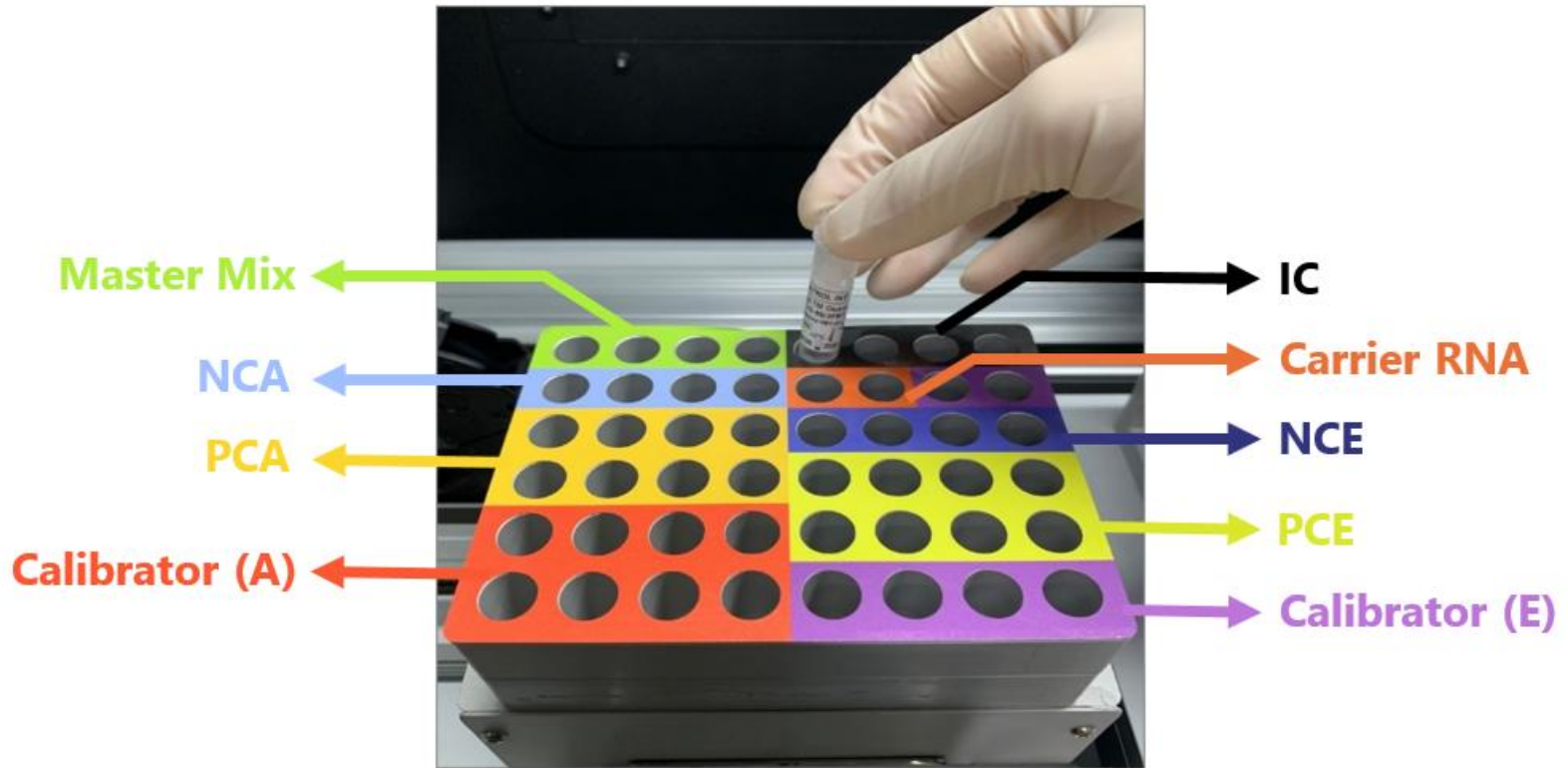
*qPCR consumables and reagents*

Tecan Tips  
Rack



# Sa2Res™ workflow

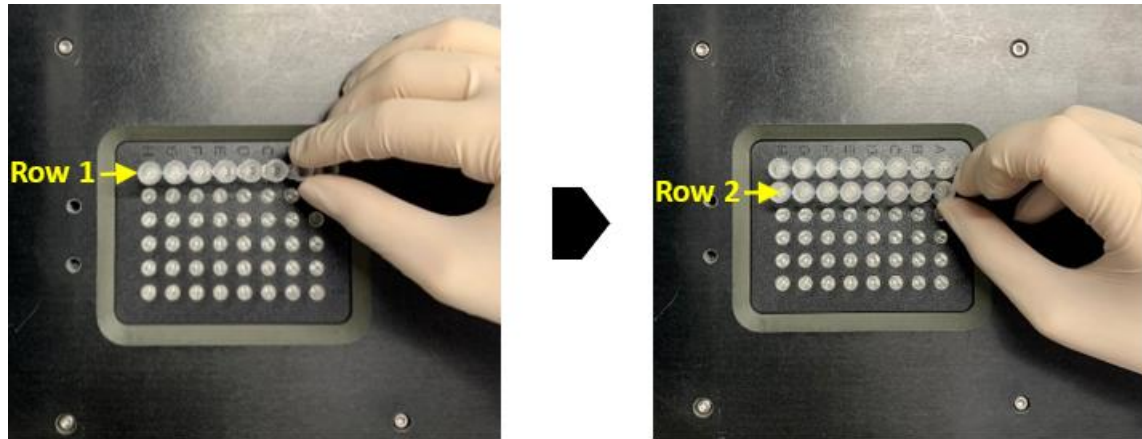
*qPCR consumables and reagents*



Reagents Rack

# Sa2Res™ workflow

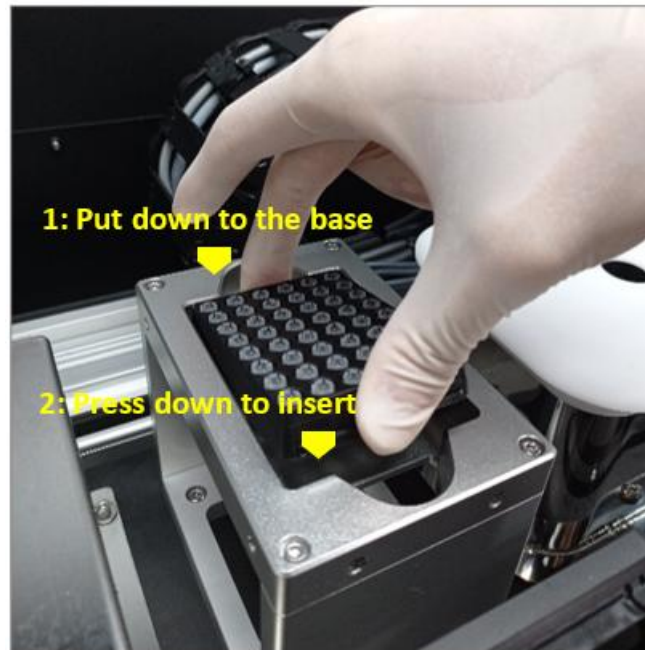
*qPCR consumables and reagents*



**Sa2Res qPCR Tubes (0.2 ml 8-strip)**

# Sa2Res™ workflow

*qPCR consumables and reagents*



Sa2Res qPCR caps

# Sa2Res™ tech spec: extraction

- \* **Extraction system:** Liquid handling technology, proprietary piston system, magnetic beads separation technology
- \* **Capacity:** 1 - 12 samples / run
- \* **Sample input volume:** 100 - 400  $\mu$ l
- \* **Elution volume:** 50 - 300  $\mu$ l
- \* **Extraction consumables:** Prefilled extraction plates with all necessary plastics
- \* **Extraction time:** 30 - 60 minutes, dependent on extraction protocol
- \* **Heat block temperature:** RT - 70°C
- \* **UV decontamination:** Built in

# Sa2Res™ tech spec: liquid handling

- \* **Module design:** 1-channel pneumatic pipetting module (ADP), incl. Liquid-level detection
- \* **Functionality:** Liquid transfer, PCR tube capping, PCR tube transfer
- \* **Pipetting volume:** 10 – 1,000  $\mu\text{l}$
- \* **Pipetting precision (CV):** 200  $\mu\text{l}$  tip:
  - at 10  $\mu\text{l}$   $\leq 2\%$
  - at 50  $\mu\text{l}$   $\leq 0.75\%$
  - at 200  $\mu\text{l}$   $\leq 0.75\%$
  
- \* **Pipetting precision (CV):** 1,000  $\mu\text{l}$  tip:
  - at 100  $\mu\text{l}$   $\leq 0.75\%$
  - at 1,000  $\mu\text{l}$   $\leq 0.75\%$

# Sa2Res™ tech spec: qPCR

- \* **Capacity:** 1 - 48 samples / run
- \* **qPCR reaction volume:** 10 - 100  $\mu$ l
- \* **Supported consumables:** 0.2 ml 8-strip PCR tubes
- \* **Temperature control range:** 40 - 99°C
- \* **Temperature accuracy:**  $\leq 0.1^\circ\text{C}$
- \* **Temperature homogeneity:**  $\leq \pm 0.1^\circ\text{C}$
- \* **Heating rate:**  $8^\circ\text{C} / \text{s}$
- \* **Cooling rate:**  $8^\circ\text{C} / \text{s}$
- \* **Optical system – light source:** High-brightness LED, 4-channels
- \* **Optical system – detection system:** Photodiodes
- \* **Optical system – Excitation wavelengths:**
  - 470 nm  $\pm$  10 nm
  - 525 nm  $\pm$  10 nm
  - 570 nm  $\pm$  10 nm
  - 620 nm  $\pm$  10 nm
- \* **Optical system – Detection wavelengths:**
  - 520 nm  $\pm$  10 nm
  - 570 nm  $\pm$  10 nm
  - 620 nm  $\pm$  10 nm
  - 670 nm  $\pm$  10 nm

# Sa2Res™ qPCR Comparison

	ABI 7500	BioRad CFX96	Qiagen RotorGene Q	Sa2Res
<b>Thermal System</b>	Peltier	Peltier	air cooled	Peltier
Average ramp rate (°C/s)	1.6	3.3	15-20	8
Temperature accuracy (°C)	±0.25	±0.2	±0.25	±0.1
Uniformity of thermal block temperature (°C)	±0.5	±0.4	±0.01	±0.1
Range of temperature (°C)	4-100	0-100	ambient-99	40-99
<b>Optical System</b>	Tungsten halogen lamp	LED	LED	LED
Excitation spectrum	5 filters	450-684 nm	365-680	470-750
Detector	CCD camera	Photodiodes	PMT	Photodiodes
Emission filters/channels	5	6	6	4
Compatible dyes	FAM, JOE, VIC, NED, TAMRA, Rox, TexasRed, Cy3, Cy5	FAM, JOE, VIC, NED, TAMRA, Rox, TexasRed, Cy3, Cy5	FAM, JOE, VIC, NED, TAMRA, Rox, TexasRed, Cy3, Cy5	FAM, JOE, HEX, R6G, ROX, TexasRed, Cy5
<b>Format</b>	96-well plates	96-well plates	rotor disk	48-well format
Test tube type (ml)	0.2	0.2	0.1 - 0.2	0.2
Supported volumes (µl)	20-100	up to 50	10-50	10-100
Weight (Kg)	64	21.4	14	-

# Sa2Res qPCR kits

## Protocols available in Sa2Res at launch:

HCV Real-TM Quant Dx

HBV Real-TM Quant Dx

STD-1 kits (e.g. Chlamydia trachomatis Real-TM)

STD-2 kits (e.g. Ureaplasma parvum/urealyticum Real-TM)

STD-3 kits (e.g. Chlamydia trachomatis/Ureaplasma/ M.genitalium Real-TM)

HPV Genotypes 14 Real-TM

CMV Real-TM Quant

EBV Real-TM Quant

MTB Real-TM

Rubella Real-TM Qual

Toxoplasma Real-TM

# Sa2Res extraction kits

## Extraction kits for Sa2Res and SaMag:

### SaMag Viral Nucleic Acids Extraction kit

To be used with SaMag or Sa2Res instruments for extraction of viral nucleic acids from plasma, serum or cell-free body fluids

### SaMag STD Nucleic Acids Extraction kit

To be used with SaMag or Sa2Res instruments for extraction and purification of sexually transmitted pathogens nucleic acids, starting from biological samples such as cervical, urethral swabs, urine sediment, seminal liquid, prostatic liquid

### SaMag Blood DNA Extraction kit

To be used with SaMag or Sa2Res instruments for extraction and purification of genomic DNA from whole blood, peripheral blood mononuclear cells or buffy coat



# Thank you!

