

minicube prep 90 seconds RNA

New molecular diffusion technology on magnetic beads ensures ultra rapid RNA and DNA extractions that preserves a larger portion of the sample compared to other extraction techniques



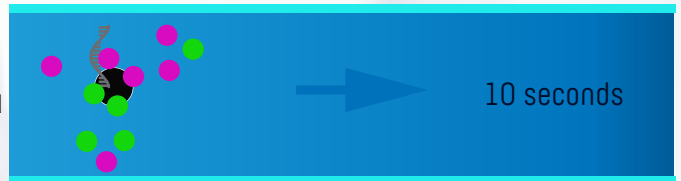
RNA DEGRADATION DURING SAMPLING OR SAMPLE PREPARATION

RNA degradation easily occurs during sample or sample preparation our new 1 channel Minicube Prep sample preparation device is designed for rapid and gentle extraction of RNA directly from saliva, blood, urine or other liquified samples. The technology is based on magnetic bead separation in a flow channel where magnetic beads are suspended in an oscillating magnetic field (patent pending) instantaneous removing contaminants from the magnetic nanoparticles by flowing contaminants downstream away from the sample.

THE SAMPOCTO PROCESS

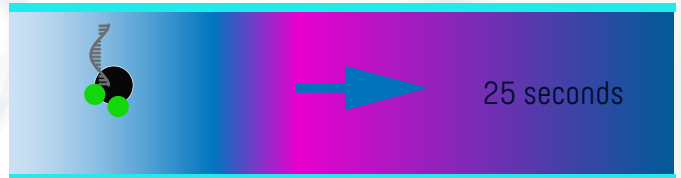
INSERT SAMPLE & CAPTURE

Sample is premixed in a tube with magnetic beads - device is compatible with any bead based extraction kits. Insert sample from 10-250 ul. Press "Insert Sample"



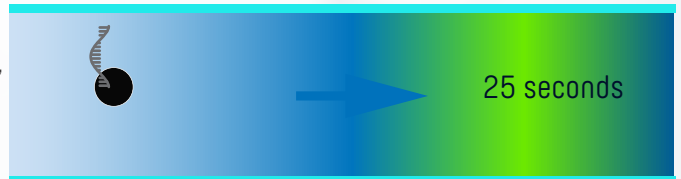
WASH 1 - BIOCHEM CLEANING

Device uses "Wash 1" chemicals to perform a removal of biological contaminations as proteins, lipids and sugars.



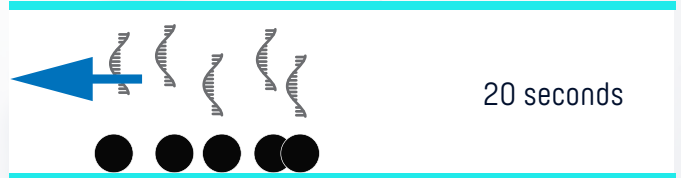
WASH 2 - ORGANIC CLEANING

Device uses "Wash 2" to remove organic solvents, residual salts and to bind the RNA tighter to the surface of the nanoparticles



ELUATION

Device is flushed with eluation buffer e.g. 20 mM KOH pH 10 which works well with PCR reactions. A 50 ul sample is collected by inserting pipette and pressing "Collect Sample"



Total time: 90 seconds

Contact

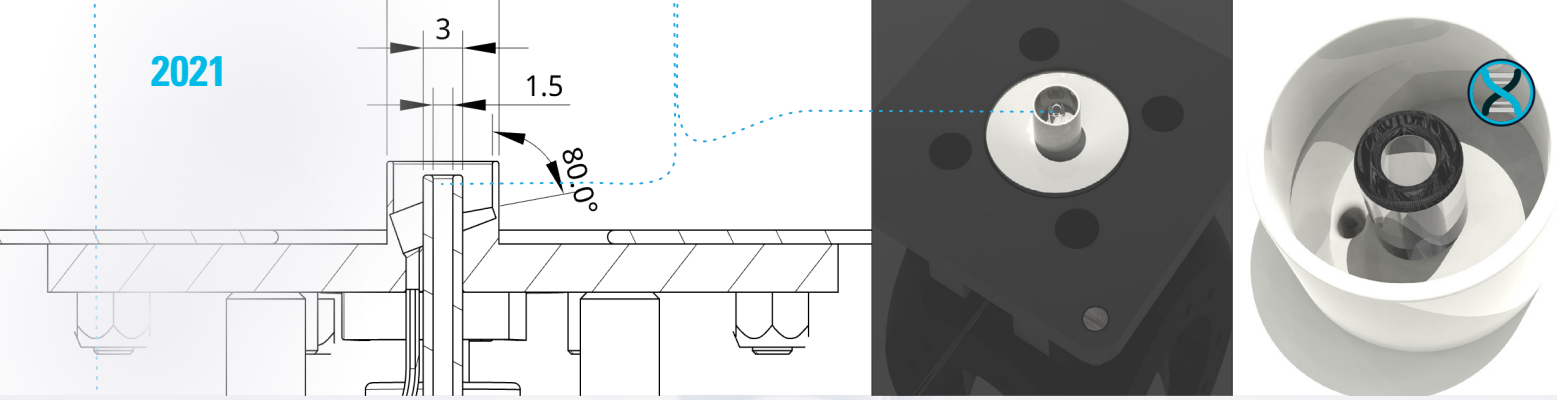


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2021

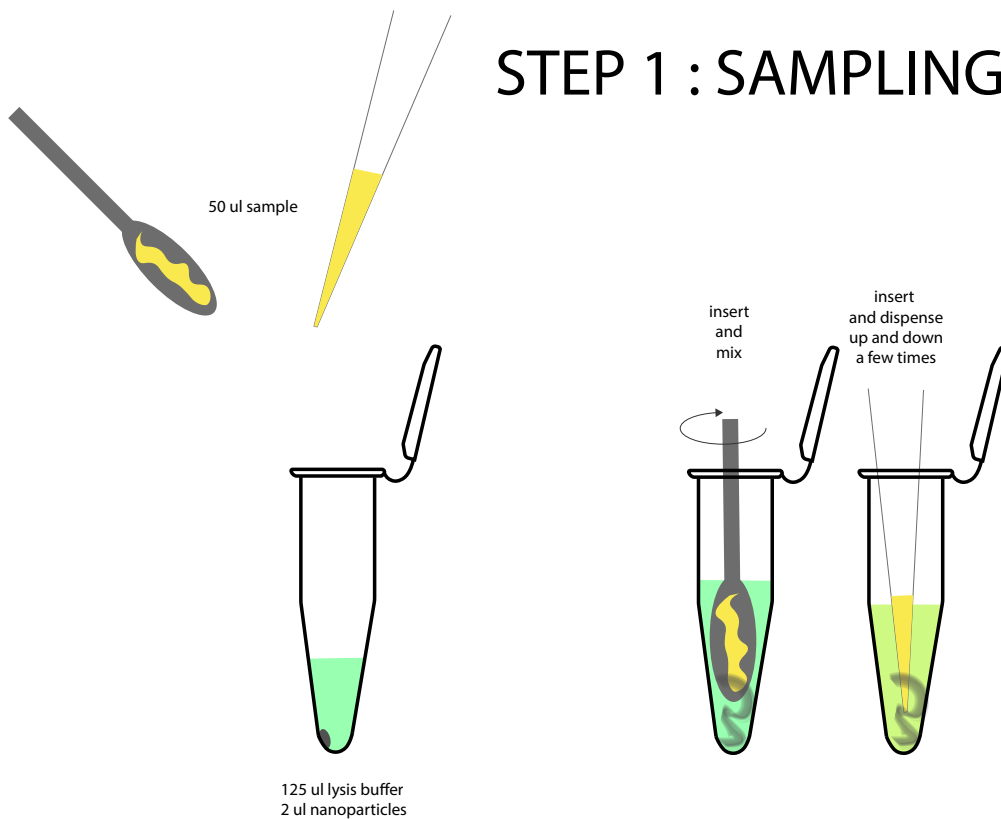


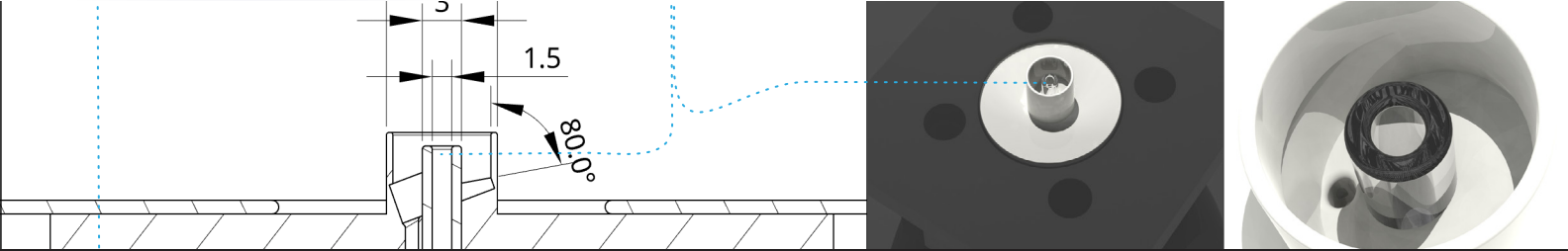
PROTOCOL

- STEP 1: SAMPLING - take your 50 ul sample and mix it into 125 lysis buffer and 2 ul nanoparticles (or scale up - the system can take up to 250 ul sample/lysis mix)
- STEP 2: INSERT SAMPLE - insert the pipette tip securely into the capillary interface - press the **PLAY ICON**
The sample is sucked into the device - discard the pipette when you see top light turns from GREEN to RED light
The sample is now being processed - follow the progress on the front LED indicators
- STEP 3: RETRIEVE SAMPLE - wait until all 16 LEDs blinks now mount a new pipette tip, dispense 50 ul in the air then insert the clean pipette tip into the Minicube Prep interface and press the **PLAY ICON** - now the system is dispensing the cleaned RNA/DNA solution into the pipette tip - wait until the LED indicators stops blinking and turns off - then remove the pipette

PROTOCOL 1-2-3

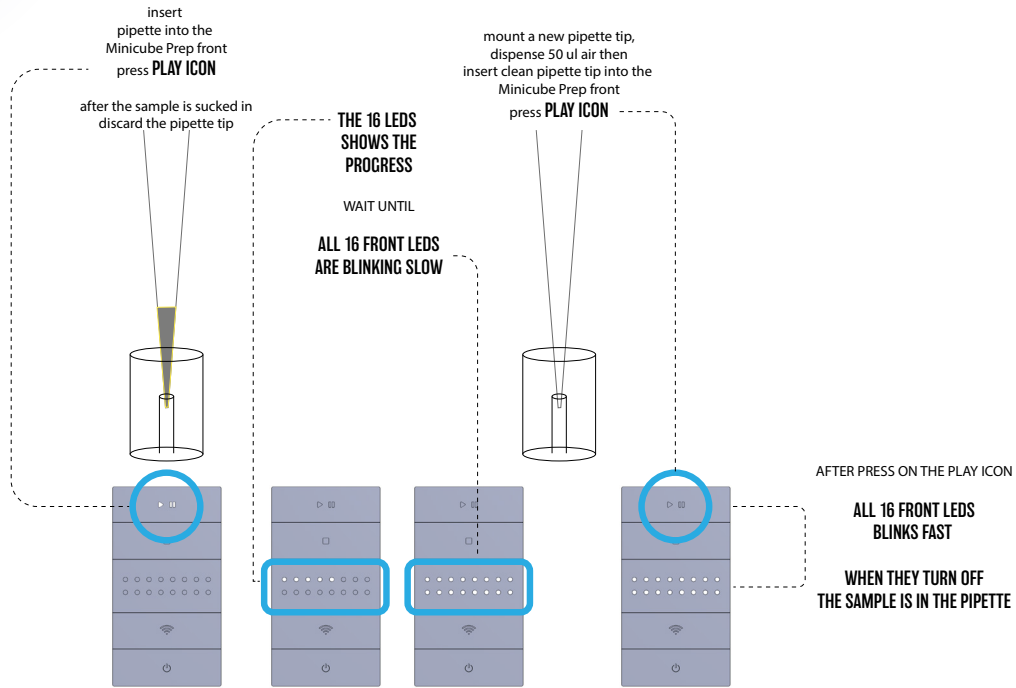
STEP 1 : SAMPLING



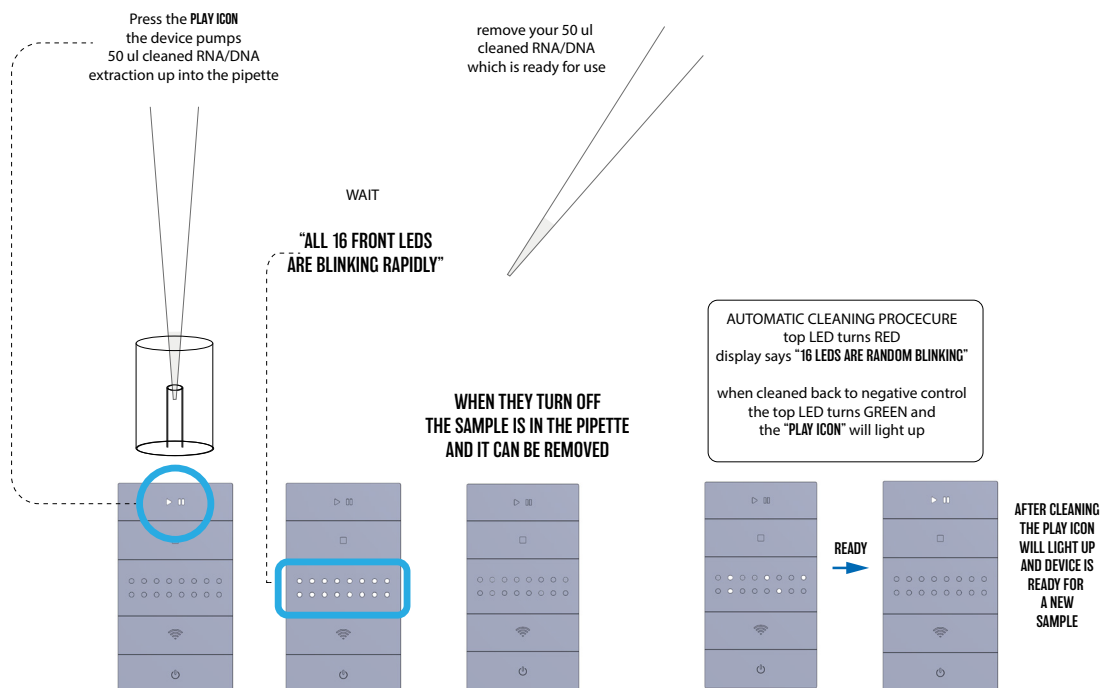


PROTOCOL 1-2-3

STEP 2 : INSERT SAMPLE



STEP 3 : RETRIEVE SAMPLE



Minicube Prep

Buffer Compositions

Minicube Prep is compatible with most bead based assays following the standard of lysis, a wash to remove salts and soaps, a second wash to bind with an alcohol and an elution step.



FOLLOWING DEFINED SOLUTIONS WORKS WITH THE SAMP OCTO RAPID LYSIS SYSTEM

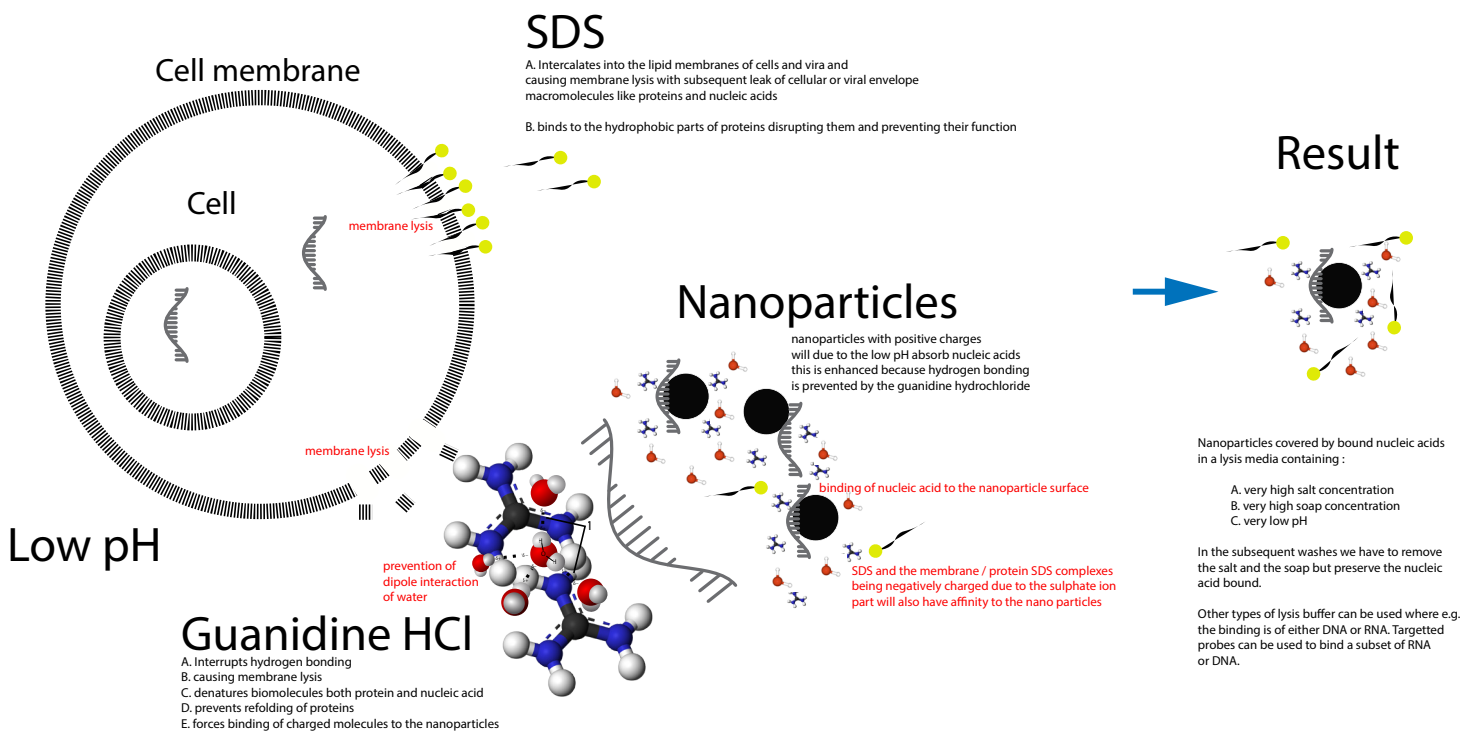
- A. Lysis buffer: to be mixed with max 1:1 ratio of sample (saliva, nose swap, urine, milk and blood or diluted stool) (see below)
- B. Wash 1 buffer: to be filled in the Wash 1 reservoir
- C. Wash 2 buffer: to be filled in the Wash 2 reservoir
- D. Wash 3 buffer: to be filled in the Wash 3 reservoir
- E. Elution buffer: to be filled in the Eluation reservoir

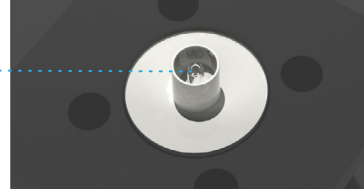
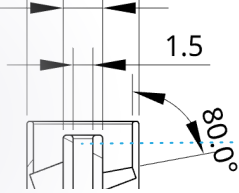
Lysis buffer: rupture of cell membranes, binding to nanoparticles

Recipe:

1% (weight percent)	Sodium dodecyl sulfate (SDS), $\text{CH}_3(\text{CH}_2)_{11}\text{SO}_4\text{Na}$
5 M	guanidine HCl
2 ul	nanoparticle suspension

Molecular actions of the lysis buffer





Minicube Prep - Buffers

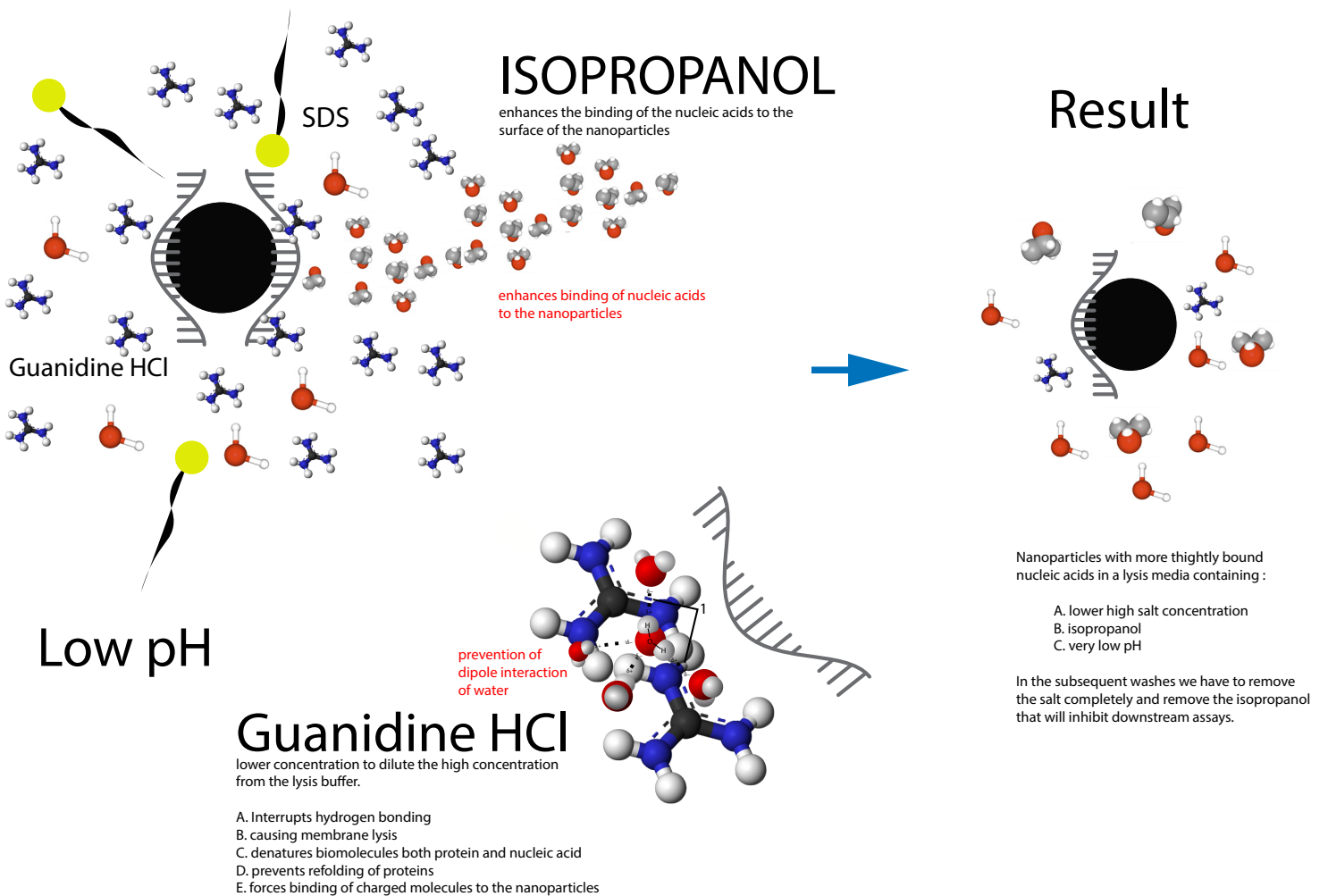
Wash 1 buffer: soap removal, salt reduction, enhanced binding

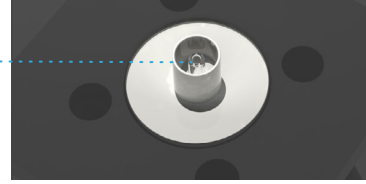
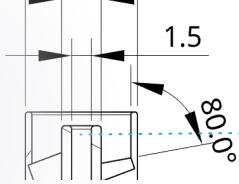
Recipe:

5% (volume percent)
1 M

isopropanol
guanidine HCl, pH 3

Molecular actions of the wash 1 buffer





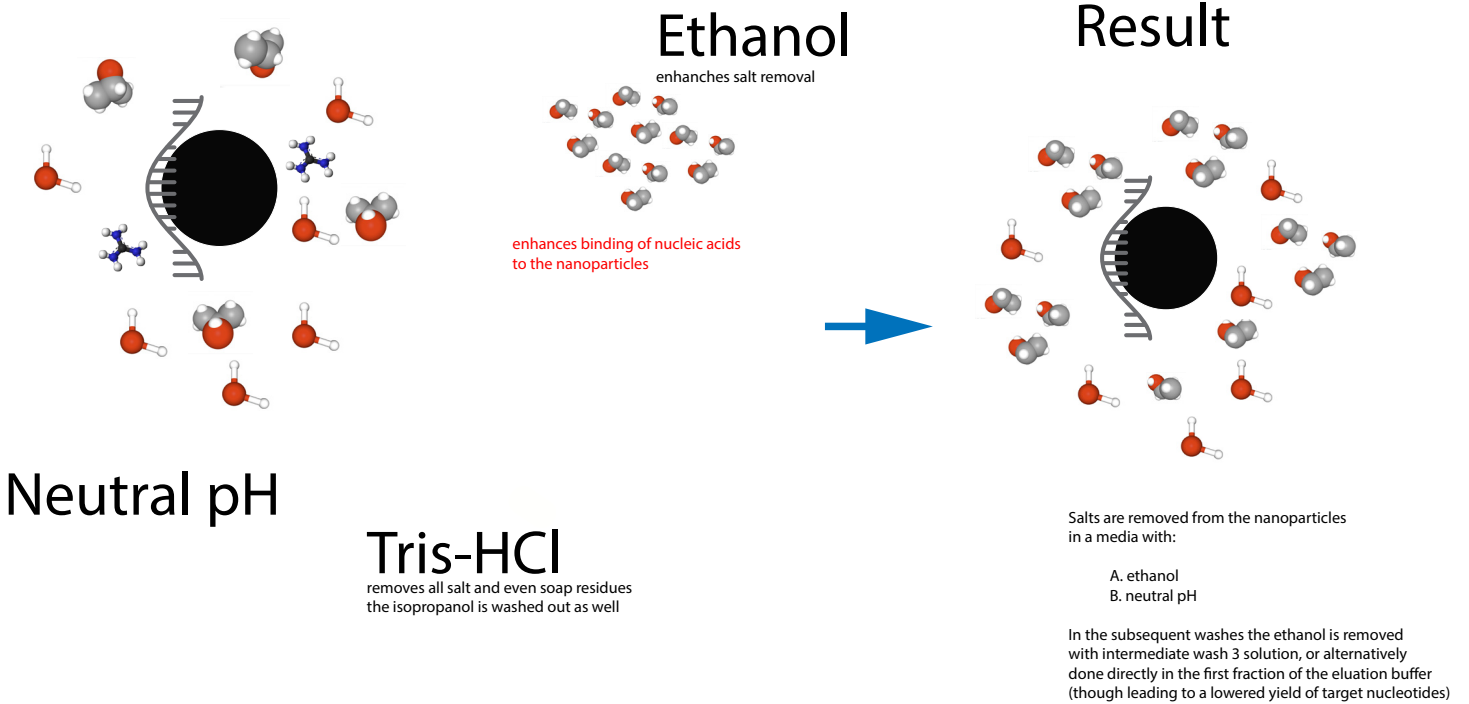
Minicube Prep - Buffers

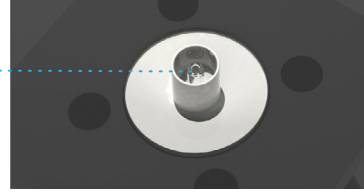
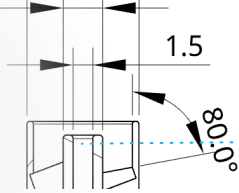
Wash 2 buffer: salt removal, isopropanol removal

Recipe:

80% (volume percent)	ethanol
10 mM	Tris-HCl, pH 7.5

Molecular actions of the wash 2 buffer





Minicube Prep - Buffers

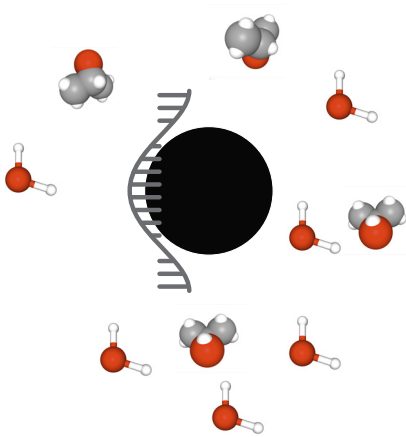
Wash 3 buffer: ethanol removal (optional)

Recipe:

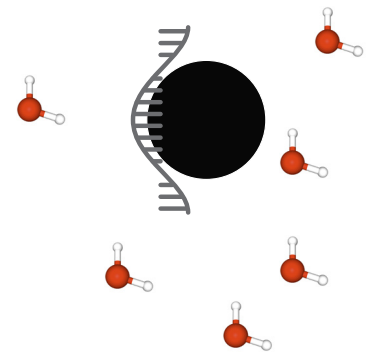
10 mM

Tris-HCl, pH 6.5

Molecular actions of the wash 3 buffer



Result



Low or neutral pH

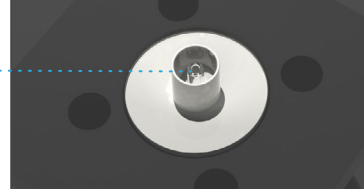
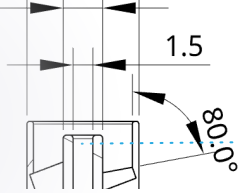
Tris-HCl

removes all salt and even soap residues the isopropanol is washed out as well

Nanoparticles with bound nucleic acids cleaned for ethanol in a media with

A. weak salt concentration with either low or neutral pH

In the subsequent wash we can eluate the nucleic acid in a buffer of choice



Minicube Prep - Buffers

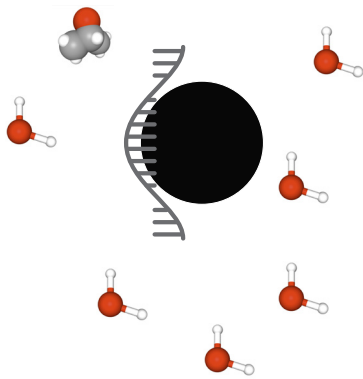
Elution buffer: release of nucleic acids

Recipe:

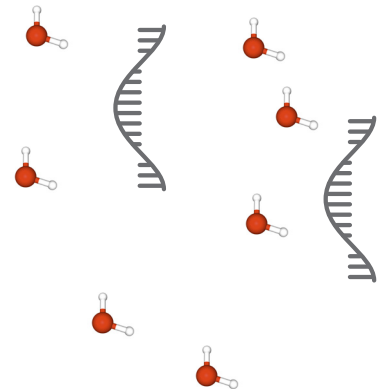
10 mM

KOH, pH 10

Molecular actions of the elution buffer



Result



High pH

KOH

Increasing the pH increases the negative charge on the nucleic acids. when the nucleic acids become charged they become strongly water soluble releasing the nucleic acids from the nano beads into the solution

This can be achieved by many different media of choice

Nucleic acids released in a media with

A. weak salt concentration but high pH

The 10 mM KOH is compatible with PCR buffers because the low pH gets buffered in the PCR buffer.



Minicube Prep Datasheet

Sample size

Pipette tip 200 ul in principle no upper limit on the sample - max vol of nanoparticles is 3 ul

Purification performance

RNA/DNA: Close to 100% recovery of a reference signal, lower limit depends on the sample

Liquids

Follow protocols above Buffer 1, 2, 3 and 4 see above

Nanoparticles Tested with EasyMag from Biomereux, but should be compatibel with any

Electrical

Input power: 24V 15A 280 W (110-240 V AC) external powersupply

Software

GNACode app: "Not available yet"

Dimensions

Closed: W x D x H: 27.5 cm x 27.5 cm x 15.5 cm (10.8" x 10.8" x 6.0")

Weight: 7.0 Kg (15 lbs) without power supply