# Geno-Sen's

# MEASLES (Rotor Gene)

# Real Time PCR Kit

**Quantitative**

for use with the

*Rotor Gene™ 2000/3000/6000*

(Corbett Research Australia)

IVD

**PACK INSERT**

Revised January 2009

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## Genome Diagnostics Pvt. Ltd.

**(An ISO 13485:2003, 9001:2000 Certified Company)**

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## *Geno-Sen's MEASLES Real Time PCR Kit for Rotor Gene 2000/3000/6000*

***MEASLES Geno-Sen's Real Time PCR Kit*** for use with the *Rotor Gene™ 2000/3000/6000*[*] (Corbett Research).

## 1. Contents of the Kit:

| Color Code | Contents | REF 9111053 100 rxns | REF 9111052 50 rxns | REF 9111051 25 rxns |
|---|---|---|---|---|
| R1 Blue | MEASLES Super mix. | 25 rxns x 4 Vials | 25 rxns x 2 Vials | 25 rxns x 1 Vials |
| R2 Yellow | Mg Sol RT. | 1 Vial | 1 Vial | 1 Vial |
| *MEASLES*-S1 Red | *MEASLES Standard 1* *1 X $10^5$ copies/µl* | 1 Vial of 300µl | 1 Vial of 300µl | 1 Vial of 300µl |
| *MEASLES*-S2 Red | *MEASLES Standard 2* *1 X $10^4$ copies/µl* | 1 Vial of 300µl | 1 Vial of 300µl | 1 Vial of 300µl |
| *MEASLES*-S3 Red | *MEASLES Standard 3* *1 X $10^3$ copies/µl* | 1 Vial of 300µl | 1 Vial of 300µl | 1 Vial of 300µl |
| MEASLES-S4 Red | *MEASLES Standard 4* *1 X $10^2$ copies/µl* | 1 Vial of 300µl | 1 Vial of 300µl | 1 Vial of 300µl |
| *MEASLES*-S5 Red | *MEASLES Standard 5* *1 X $10^1$ copies/µl* | 1 Vial of 300µl | 1 Vial of 300µl | 1 Vial of 300µl |
| W White | Molecular Grade Water. | 1 Vials of 1 ml | 1 Vial of 1 ml | 1 Vial of 1 ml |
| IC-1 (R3) Green | IC-1 RG (R3) | 1 Vial of 1 ml | 1 Vial of 1 ml | 1 Vial of 1 ml |

**R = Reagents**
**S = Quantitation Standards**
**W = Molecular Grade Water.**

All Vials have Color Coder tops to distinguish between different reagents.

## 2. Storage of the Kit.

All the reagents of the kit should be stored at -20°C and is stable till expiry at this temperature. Repeated thawing and freezing (> 3x) should be avoided, as this may reduce the sensitivity of the assay. If the kit is to be used only occasionally, the reagents should be frozen in aliquots. Storage at +4°C is not recommended & should not exceed a period of 2 hours in any case.

[*] The *Rotor Gene*™ 2000/3000/6000 is a registered trademark of Corbett Research, Australia.

# 3. MEASLES Information

## Application

**Measles**, also known as **rubeola**, is a disease caused by a virus, specifically a paramyxovirus of the genus *Morbillivirus.* The measles virus is transmitted via respiratory secretions, and causes a very serious febrile illness. It first infects the respiratory mucosa, spreads through the lymphatics and bloodstream, and can then infect the conjunctiva, respiratory tract, urinary tract, GI tract, endothelial cells, and the central nervous system. Measles virus can give three different forms of infections in the central nervous system. These are acute postinfectious encephalitis, acute progressive infectious encephalitis, and subacute sclerosing panencephalitis (SSPE). The postinfectious acute disease is interpreted to reflect an autoimmune reaction. The acute progressive form of brain disease, also referred to as inclusion body encephalitis, reflects a direct attack by the virus under conditions of yielding cellmediated immunity. The late progressive form of encephalitis (SSPE) has been extensively analyzed. Recent molecular genetic studies have unravelled a range of mechanisms by which a defective expression of either the matrix, the fusion, or the hemagglutinin proteins may lead to viral persistence in brain cells under conditions not allowing identification by immune surveillance mechanisms. The maculopapular rash, which starts at the hairline and spreads over the whole body, is caused by immune T-cells targeted to the infected endothelial cells of the small blood vessels. T-cell deficient individuals do not have the rash, but do have uncontrolled disease which usually results in death. The damage, as well as the control of the disease, is most probably caused by the immune system. Pneumonia and encephalitis are serious consequences. Subacute sclerosing panencephalitis (SSPE) is a very serious sequelae caused by a defective measles virus. It can cause neurological symptoms months or even years after the original infection.

## Signs and symptoms

Usually signs and symptoms of measles appear 10 to 12 days after exposure to the virus. They typically include:

- Fever
- Dry cough
- Runny nose
- Inflamed eyes (conjunctivitis)
- Sensitivity to light
- Tiny red spots with bluish-white centers on the inner lining of the cheek, called Koplik's spots
- A rash made up of large, flat blotches that often flow into one another

# The course of the measles virus

Measles typically begins with a mild to moderate fever, accompanied by other signs and symptoms, such as a persistent cough, runny nose, inflamed eyes (conjunctivitis) and sore throat. Two or three days later, Koplik's spots — a characteristic sign of measles — appear. Then a fever spikes, often as high as 104 or 105 F. At the same time, a red blotchy rash surfaces, usually on the face, along the hairline and behind the ears. This slightly itchy rash rapidly spreads downward to the chest and back and, finally, to the thighs and feet. After about a week, the rash fades in the same sequence that it appeared.

A live, attenuated vaccine has been available since 1967. It is given in combination with mumps and rubella vaccines (MMR) after 15 months of age. Individuals who recieved the killed vaccine prior to the introduction of the live attenuated vaccine do not have lasting immunity and should be revaccinated with the live virus. It is now also recommended that all individuals be re-vaccinated after eighteen years of age. Exposed, non-immune, individuals should be given immune serum globulin.

The *Geno-Sen's* MEASLES Quantification assay is developed for laboratory scale or high-throughput quantitative transcript analysis by real time quantitative fluorescence PCR.

Geno Sen's standardized ready-to-use Control and Reaction mix allow fast processing of the samples.

**Samples which can be used for Extraction: Serum, plasma, whole blood, C.S.F., Oral Swabs, Bronchial Swabs etc.**

## 4. Precautions for PCR

The following aspects should always be taken care of:

- Store positive material (Specimens, Standards or amplicons) separately from all other reagents and add it to the reaction mix in a separate facility.
- Thaw all components thoroughly at room temperature before starting the assay.
- When thawed, mix the components and centrifuge briefly.
- Work quickly on ice or in the Cooling Block.
- All the reagents including the NTC (except for standards & specimens) should be mixed & dispensed in pre-mix area.
- All the standards & specimens should be mixed & dispensed in extraction area.

- Use pipette tips with filters only.
- Always use disposable powder-free gloves

### 5. Additionally Required Materials and Devices

- RNA isolation kit (see **8.a. RNA extraction**)
- 0.2 ml PCR tubes for use with 36-well rotor (Corbett Research, Cat.-Nr.: SE-1003F) alternatively 0.1 ml PCR tubes for use with 72-well rotor (Corbett Research, Cat.-Nr.: ST-1001)
- Micro Pipettes Variable Volume 2-20µl, 10-100µl, 100-1000µl,
- Sterile pipette tips with aerosol barrier 2-20µl, 10-100µl, 100-1000µl,
- Disposable powder-free gloves
- Vortex mixer
- Centrifuge Desktop with rotor for 1.7 ml reaction tubes
- *Rotor Gene™ 2000/3000* or *Rotor Gene™ 6000*, Corbett Research (The Real time PCR Instrument)

## 6. Principle of Real-Time PCR

The robust assay exploits the so-called Taqman principle. During PCR, forward and reverse primers hybridize to a specific sequence product. A TaqMan probe, which is contained in the same reaction mixture and which consists of an oligonucleotide labeled with a 5'-reporter dye and a downstream, 3'-quencher dye, hybridizes to a target sequence within the PCR product. A Taq polymerase which possesses 5' - 3' exonuclease activity cleaves the probe. The reporter dye and quencher dye are separated upon cleavage, resulting in an increase in fluorescence for the reporter. Thus, the increase in fluorescence is directly proportional to the target amplification during PCR.

## 7. Description Of the Product.

The ***Geno-Sen's MEASLES*** *PCR* Reagents constitute a ready to use system for detection and quantification of MEASLES using Polymerase chain reaction (PCR) in the Rotor Gene 2000/3000/6000 (Corbett Research). *The Specific Master* mix contains reagents and enzymes for the specific amplification of MEASLES and for the direct detection of the specific amplicon in fluorescence channel Cycling A.FAM of the *Rotor Gene 2000/3000/6000 & the Reference gene on* Cycling A. Joe. External positive Standards (MEASLES S 1-5) are supplied which allow the determination of the gene load. For further information, please refer to section 8.c Quantitation.

# 8. Procedure

## 8.a RNA Extraction

RNA Extraction kits are available from various manufacturers. Sample volumes for the RNA Extraction procedure depend on the protocol used. Please carry out the RNA Extraction according to the manufacturer's instructions. The recommended Extraction kits are the following:

| **Sample Material** | **Nucleic Acid Isolation Kit** | **REF Cat. Num.** | |
|---|---|---|---|
| Serum or plasma. | QIAamp Viral RNA Mini extraction Kit (50)<br>OR<br>Viral RNA extraction kit Bioneer | 52904<br><br>K-3033 | QIAGEN<br><br>Bioneer |

However the customer can use their own extraction systems depending on how good the yield is. Always use an extraction kit with a higher RNA yield.

Blood collection tubes coated with anticoagulants may inhibit the PCR, However these inhibitors will be eliminated by the use of the isolation kits given above. It is recommended to avoid the usage of heparin blood.

When using Extraction protocols with ethanol-containing washing buffers, please carry out an additional centrifugation step before the elution to remove any remaining ethanol. This prevents possible inhibition of PCR.

The *MEASLES Rotor Gene PCR Reagents* should not be used with phenol based isolation methods.

## 8.b *Inhibition Control:*

Inhibition Control Gene allows the user to determine & control possible PCR inhibition. The Inhibition Control gene reagents are in built in the premix provided and need not be run separately. There is need to add internal control Gene in the reaction mix which has been provided as IC-1 RG (R3). To add the IC Gene 0.5µl/rxn of R3 is added to the premix as shown in the Figure 4 & 5. The results can be visualized in the Joe channel.

## 8.c Quantitation

The quantitation standards provided in the kit *(MEASLES S 1-5)* are treated in the same way as extracted samples and the same volume is used i.e. (15µl) instead of the sample. To generate a standard curve in the *RotorGene™ 2000/3000/6000*, all 5 Standards should be used as defined in the menu window *Edit Samples* of the *RotorGene™* software. The same should also be defined as standards with the specified concentrations (see *RotorGene™* Manual). The standard curve generated as above can also be used for quantitation in subsequent runs, provided that at least one standard is used in the current run. For this purpose, the previously generated standard curve needs to be imported (see *Rotor Gene™ 2000/3000/6000 Manual*). However, this quantitation method may lead to deviations in the results due to variability between different PCR runs & due to varying Reaction efficiencies.

**Attention:** The standards are defined as copies/µl. The following formula has to be applied to convert the values determined using the standard curve into Copies/ml of sample material:

$$\textbf{Result (copies/ml)} = \frac{\textbf{Result (copies/µl) x Elution Volume (µl)}}{\textbf{Sample Volume (ml)}}$$

Or else direct conversion can be done keeping in mind the starting volume of the sample & the final eluted Volume e.g.

If the starting volume of the sample while using the Qiagen QIAamp Viral RNA Mini extraction kit is 140µl & the final Eluted Volume is 50µl then to obtain the direct values i.e. copies/ml for the patient samples the following values for the standards can be fed directly into the operating software which is again based on the above formula and will yield direct conversion of per ml of patient sample data.

| | | |
|---|---|---|
| S1: | $10^5$ copies/µl = | 35750000 copies/ml |
| S2: | $10^4$ copies/µl = | 3575000 copies/ml |
| S3: | $10^3$ copies/µl = | 357500 copies/ml |
| S4: | $10^2$ copies/µl = | 35750 copies/ml |
| S5: | $10^1$ copies/µl = | 3575 copies/ml |

In case Bioneer RNA extraction kit is being used where the starting volume is 200µl & the final Eluted Volume is 50µl then to obtain the direct values i.e. copies/ml for the patient samples the following values for the standards can be fed directly into the

operating software which is again based on the above formula and will yield direct conversion of per ml of patient sample data.

| | | |
|---|---|---|
| S1: | $10^5$ **copies**/μl = | 25000000 **copies**/ml |
| S2: | $10^4$ **copies**/μl = | 2500000 **copies**/ml |
| S3: | $10^3$ **copies**/μl = | 250000 **copies**/ml |
| S4: | $10^2$ **copies**/μl = | 25000 **copies**/ml |
| S5: | $10^1$ **copies**/μl = | 2500 **copies**/ml |

## 8.d Preparation for PCR & amplification.

First make sure that the Cooling Block (accessory of the *Rotor Gene*™, Corbett Research) is pre-cooled to +4°C in a Refrigerator or Deep Freezer. Place the desired number of PCR tubes into the Cooling Block. Make sure that the tubes for standards & at least one negative control (*Water, PCR grade*) are included per PCR run. To generate a standard curve, use all supplied Standards *(MEASLES S 1-5)* for each PCR run. Before each use, all reagents need to be thawed completely and mixed (by pipetting or by brief vortexing).

Please follow the pipeting scheme mentioned below for each sample depending upon the number of samples a mix can be prepared as follows. Each sample

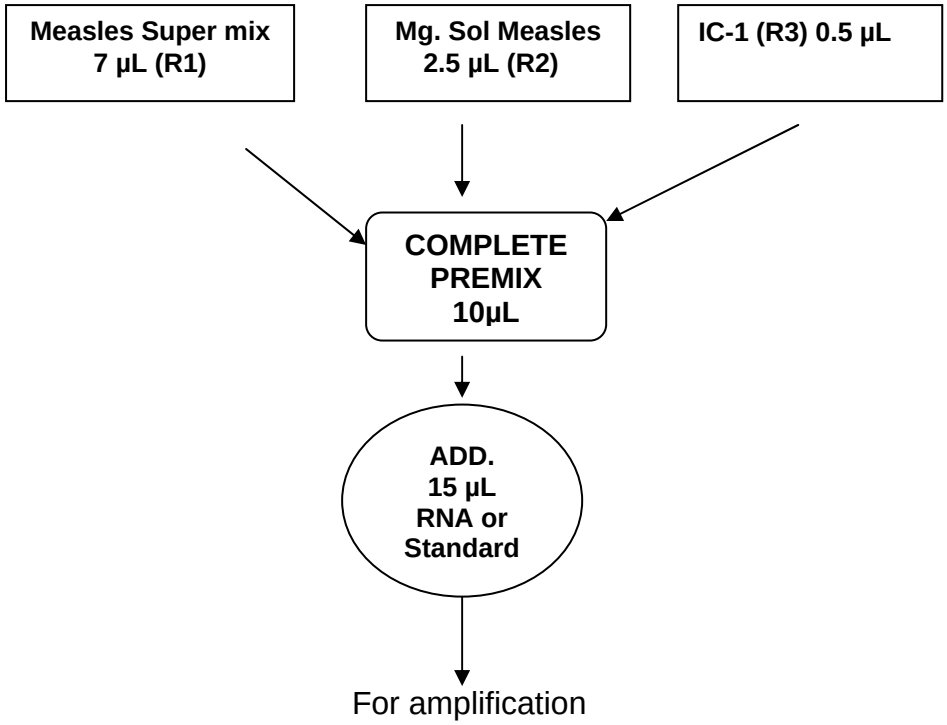



Fig. 4.

Depending upon the number of samples the following pipetting scheme can be followed. e.g. for 10 rxns.

| **MEASLES MASTER MIX** | **1 rxns.** | **10 rxns.** |
|---|---|---|
| **MEASLES Super Mix (R1)** | **7 µL** | **70 µL** |
| **MEASLES Mg Sol. (R2)** | **2.5 µL** | **25 µL** |
| **IC-1 (R3)** | **0.5 µL** | **5 µL** |
| **Total** | **10µL** | **100µL** |

Fig. 5.

Pipette 10 µl of the Master Mix into each labelled PCR tube. Then add 15 µl of the earlier extracted RNA to each sample tube and mix well by pipeting up and down. Correspondingly, 15 µl of the Standards (MEASLES *S1-5*) must be used as a positive control and 15 µl of water (*Water, PCR grade*) as a negative control. Close the PCR tubes and transfer the same into the rotor of the *RotorGene*™ instrument. The *RotorGene*™ software versions 5.0.53 and higher require a Locking Ring (accessory of the *RotorGene*™, Corbett Research) to be placed on top of the rotor to prevent accidental opening of the tubes during the run.

## 8.e. Programming the *RotorGene*™ 2000/3000

The *RotorGene*™ *2000/3000* PCR program for the detection of MEASLES can be divided into following steps:

A. Setting of general assay parameters & reaction volume
B. Thermal Profile & Calibration
C. Cycling profile/ cDNA synthesis & Initial activation of the Hot Start enzyme
D. Cycling for Amplification of cDNA
E. Adjustment of the sensitivity of the fluorescence channels
F. Starting of the *Rotor Gene*™ run

Program the *RotorGene*™ *2000/3000* for these 5 steps according to the parameters shown in Fig. 6-21. All specifications refer to the *RotorGene*™ software version 6.0.33. Please find further information on programming the *RotorGene*™ in the *RotorGene*™ *2000/3000 Operator's Manual*,. In the illustrations these settings are shown by arrows

## Setting of general assay parameters & Reaction volume.

First, confirm whether the PCR tubes used are No Domed PCR tubes by clicking in the box as shown in the figure. Please note that tubes with domes cannot be used in Rotor gene hence click in the box as shown below.

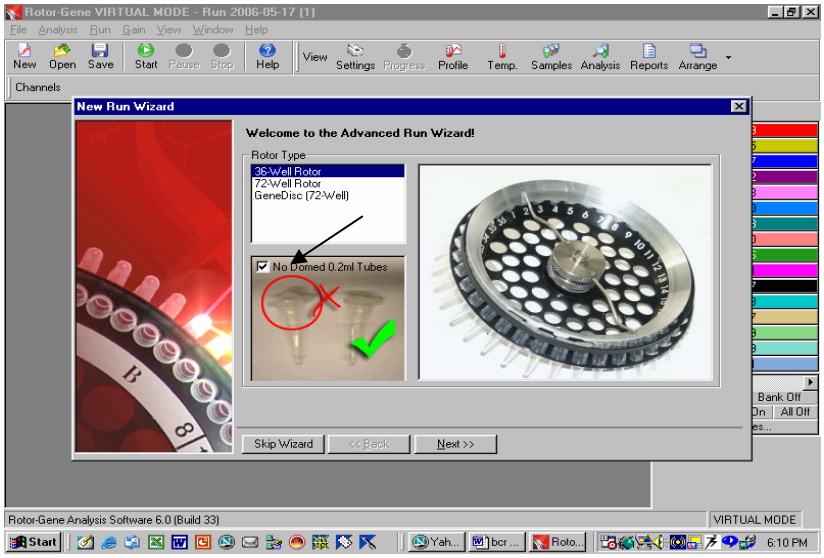



Fig. 6.

## Confirmation of Reaction Volume as follows.

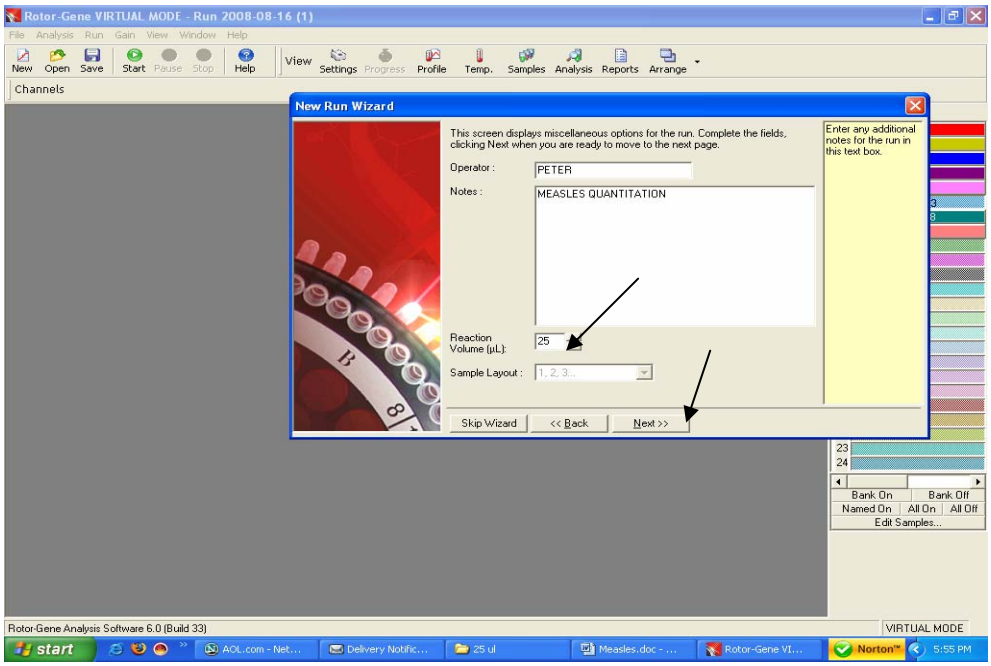



Fig. 7. Setting of general assay parameters.

- Please click on the volume buttons to make sure that 25µl is reflected in the window as shown above.
- Then click next and a new window will open as shown below.

## THERMAL PROFILE & CALIBRATION:

**Here the thermal profile for the assay will be defined.**

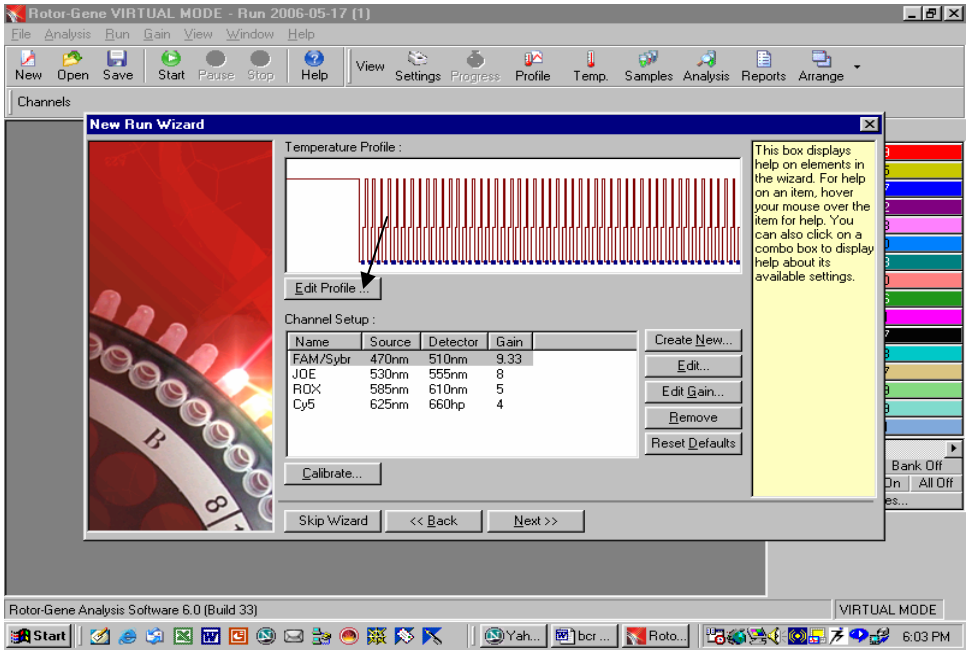



Fig. 8.

Programming the temperature profile is done by activating the button *Edit Temperature Profile* in the next *New Experiment Wizard* menu window as shown above.

**CYCLING PROFILE: First hold** 50°C for 15 minutes i.e. cDNA synthesis step as below

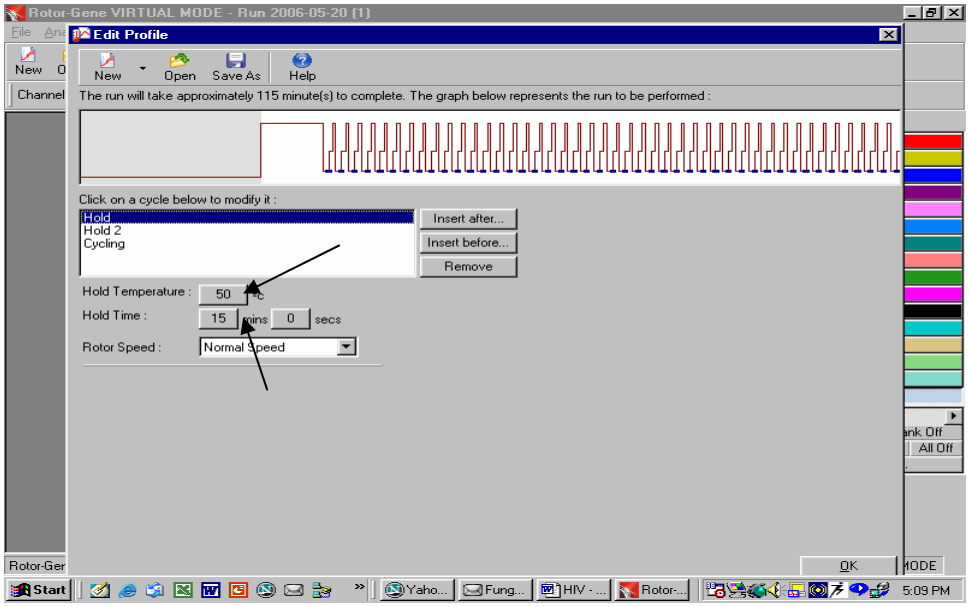



Fig. 9.

**CYCLING PROFILE: Second hold** 95°C for 10 minutes as below

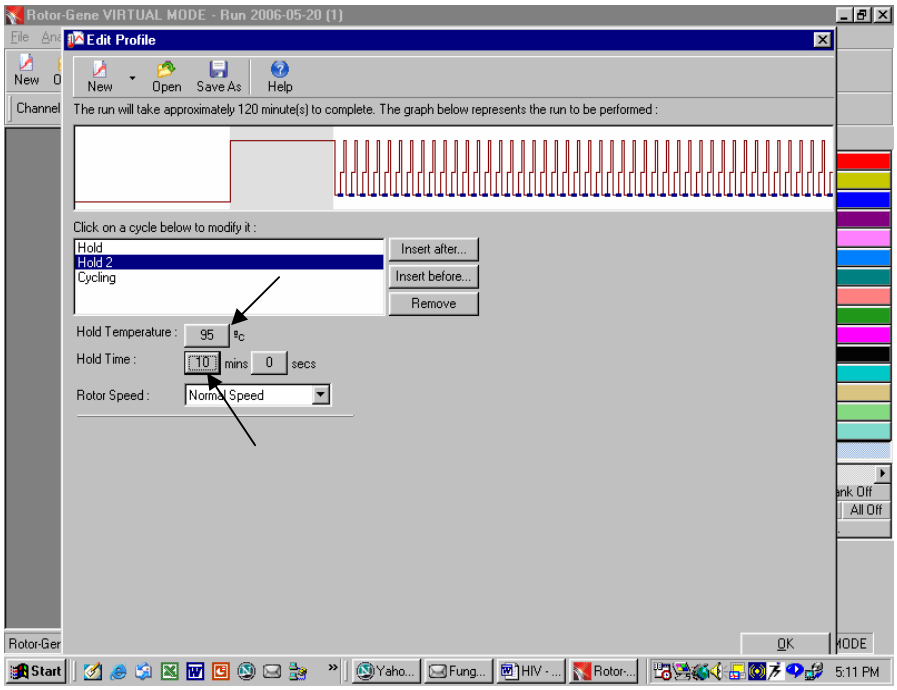



Fig. 10. Initial activation of the Hot Start enzyme.

**Setting up of denaturation step in the cycling profile as depicted below i.e.** 95°C for 15 seconds.

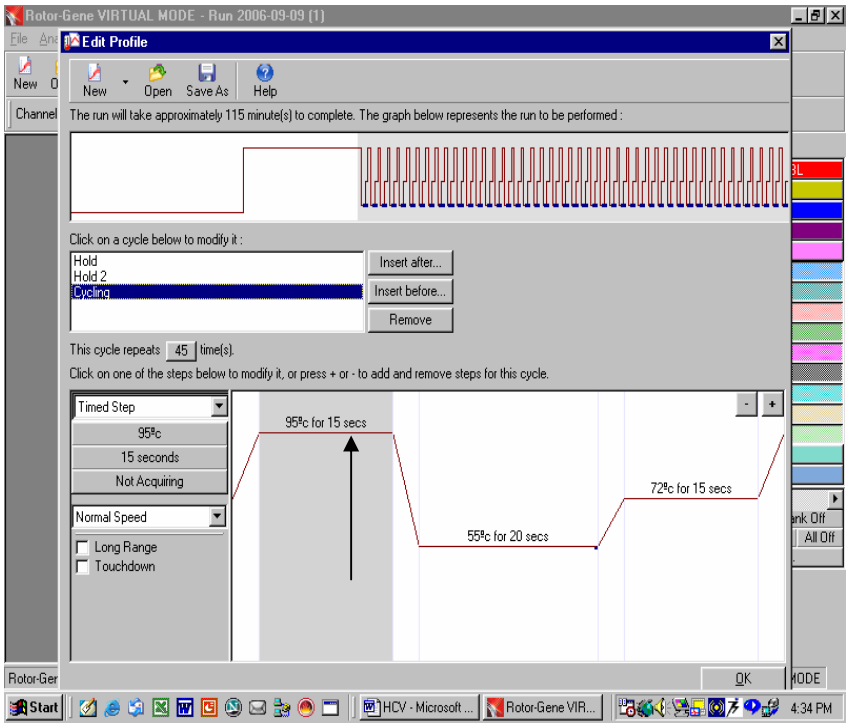



Fig. 11.

**Setting up of Anneling step in the cycling profile as depicted below i.e.** 55°C for 20 **Seconds and defining the Data acquiring channel i.e FAM & JOE**

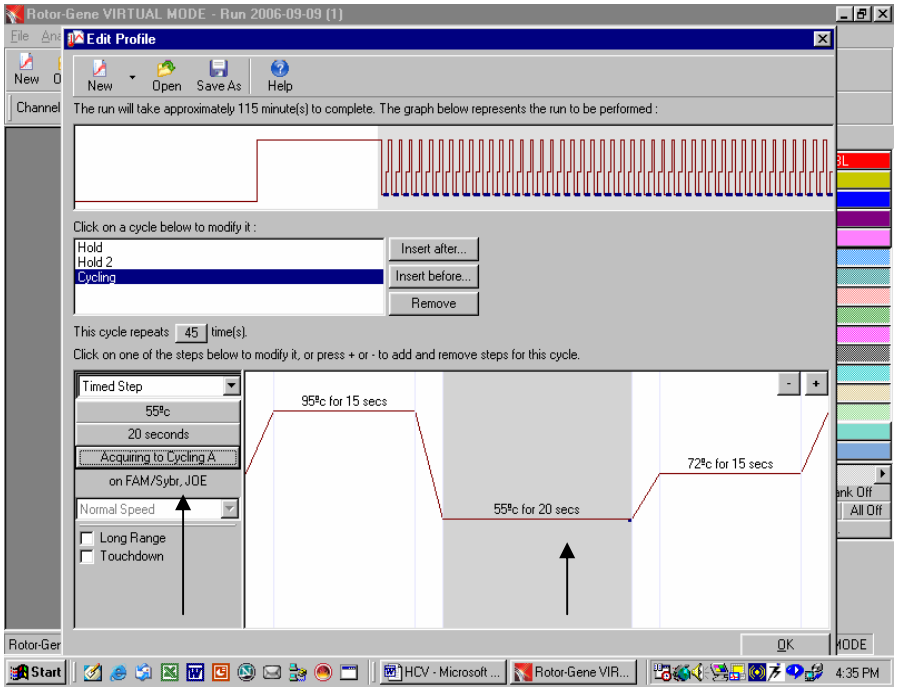



Fig. 12.

**Setting up of Extension step in the cycling profile as depicted below i.e. 72**°C for 15 **Seconds**

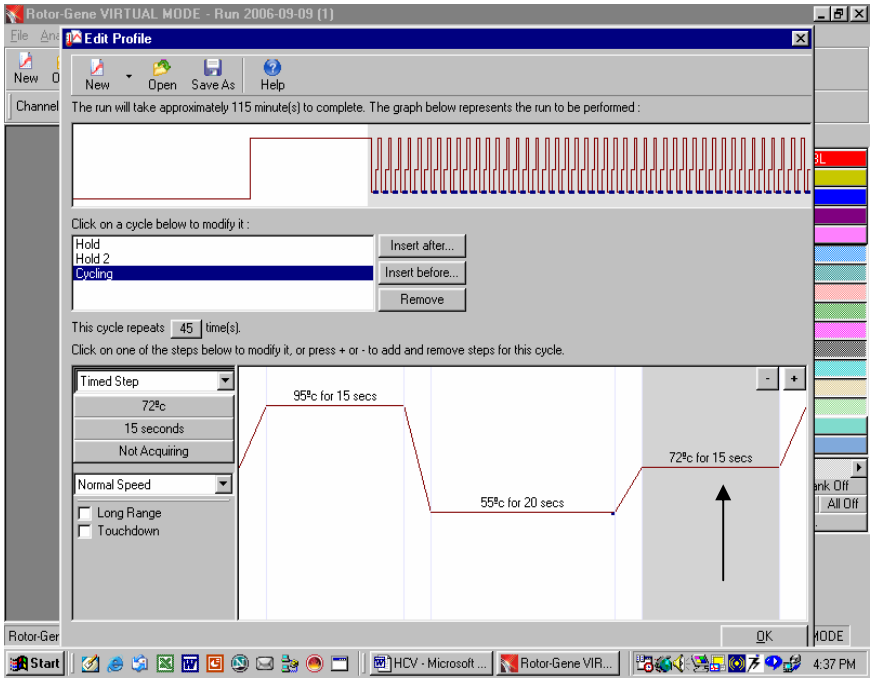



Fig. 13.

**Setting up of Number of Cycles to 45 cycles in the cycling profile as depicted below.**

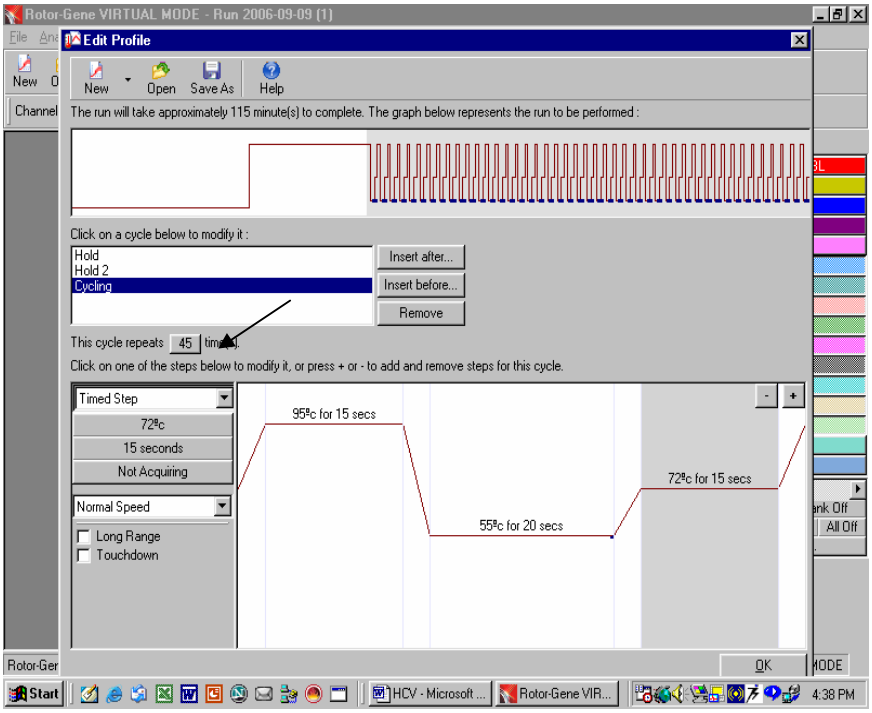



Fig. 14.

**Final Confirmation of the Thermal profile by pressing OK button as shown below.**

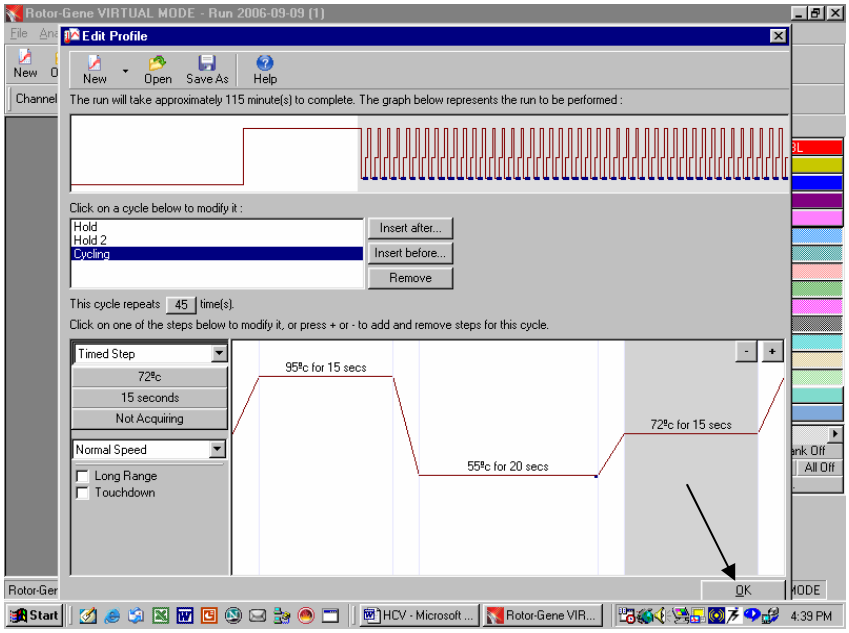



Fig. 15.

**Setting the gains for the acquiring channel by clicking at the Calibrate button as shown below.**

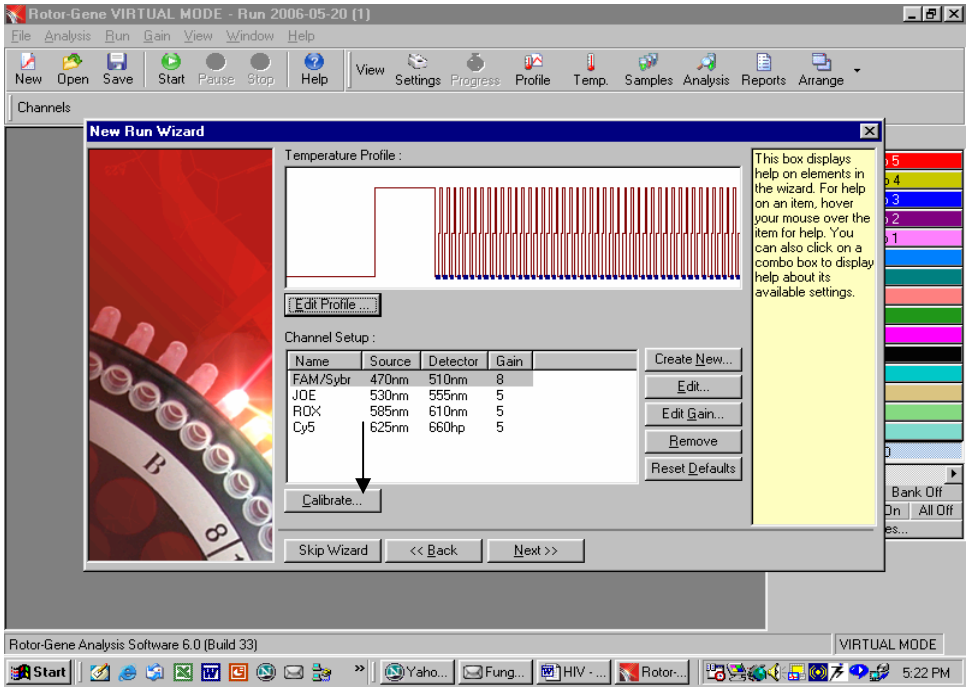



Fig. 16.

The detection range of the fluorescence channels has to be determined according to the fluorescence intensities in the PCR tubes. This adjustment is done in the menu window *Auto Gain Calibration Setup* (activation in menu window *New Experiment Wizard* under *Calibrate*). Please set the calibration temperature to the annealing temperature of the amplification program (compare Fig. 17).

**Adjustment of the fluorescence channel sensitivity as shown below.**

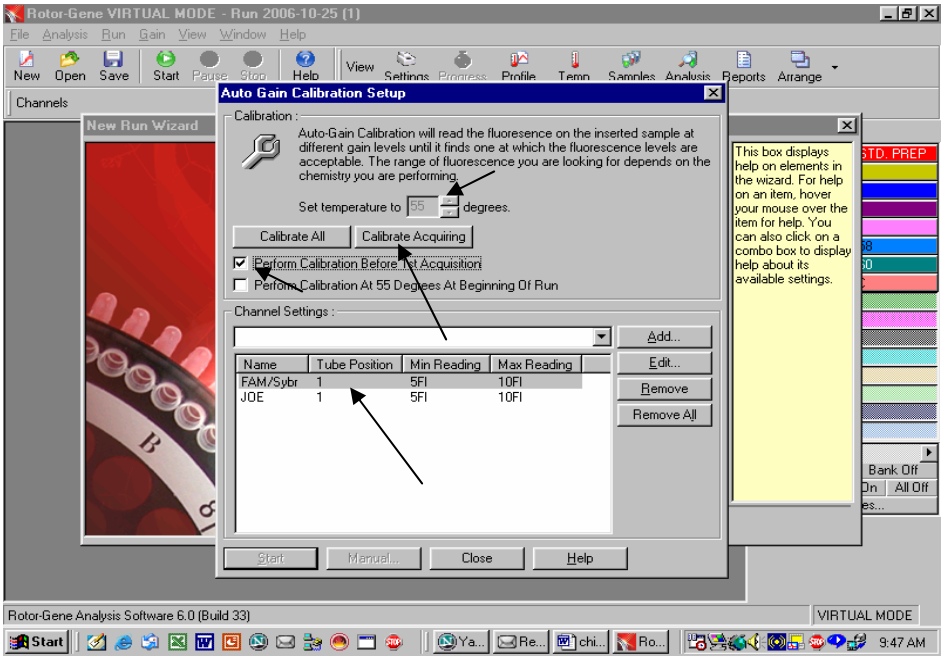



Fig. 17.

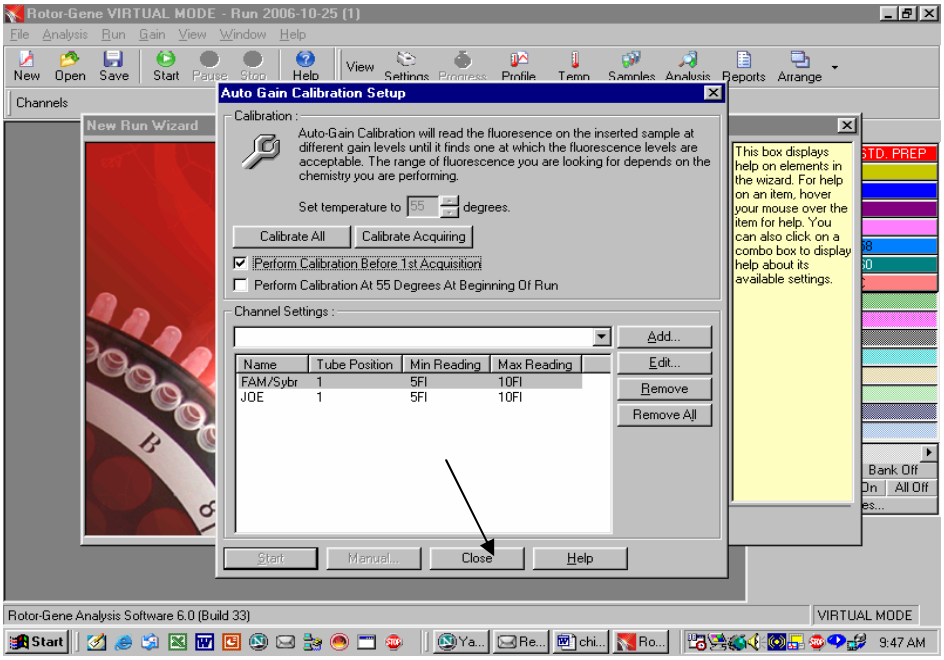



Fig. 18.

Please do not forget to click on the box against " Perform calibration before 1st. acquisition" After that press Close and a new window will open as shown below.

The gain values determined by the channel calibration are saved automatically and are listed in the last menu window of the programming procedure.

**PRESS NEXT**

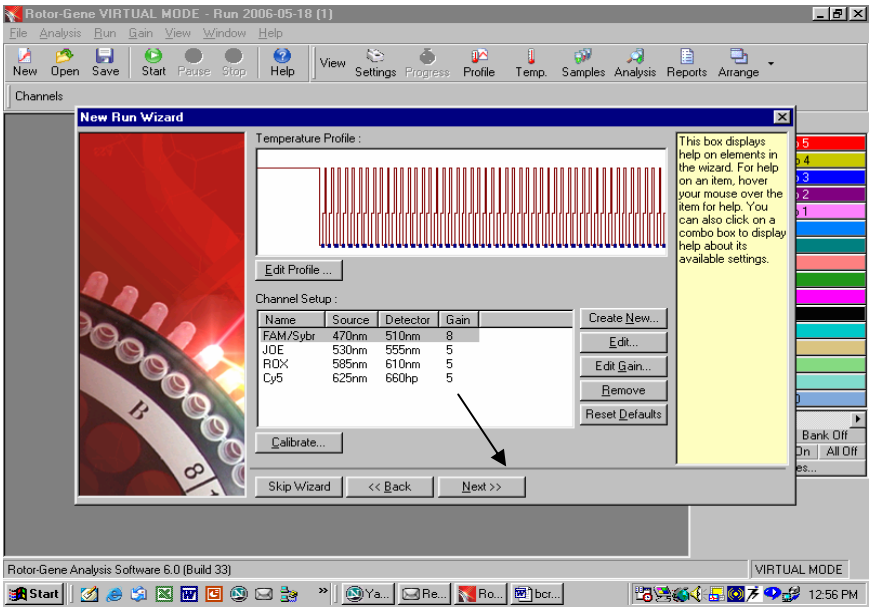



Fig. 19.

Starting of the *Rotor Gene*™ run.

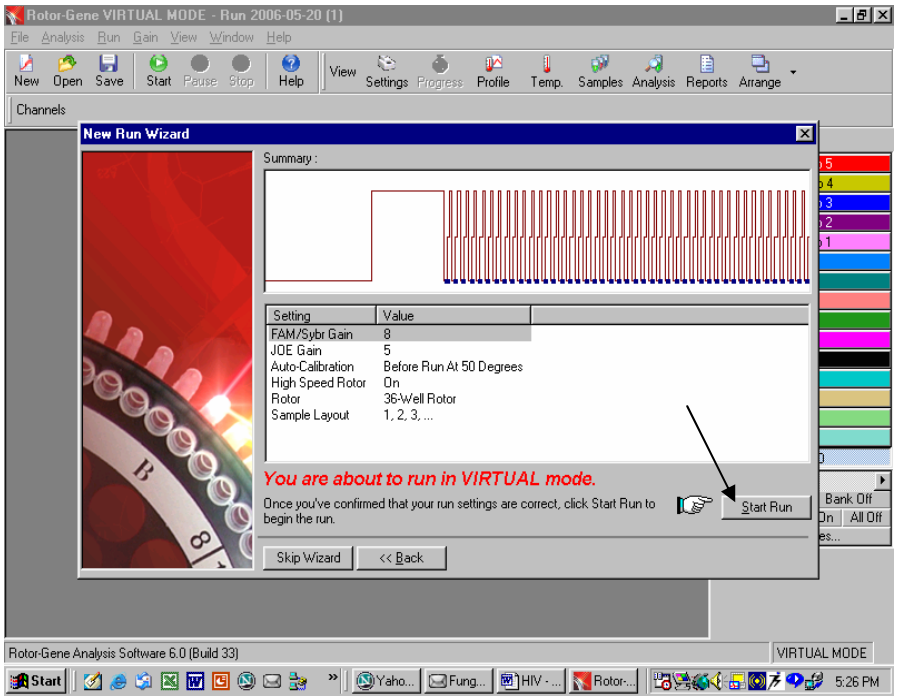



**Fig. 20:**

**Press Start Run Button.**

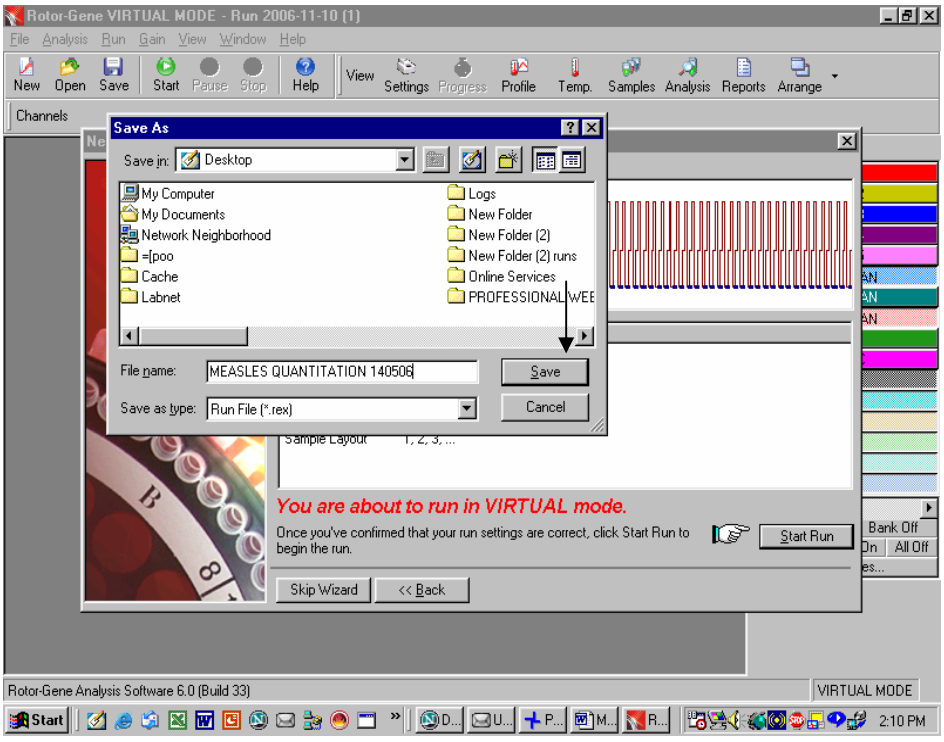



Fig. 21.

**SAVING THE RUN FILE AS ABOVE**

Store the run file either in my documents or a designated folder as shown above.

The moment save button is clicked after the file name, machine will start.

# 8.f. Programming the *RotorGene*™ 6000

The *RotorGene*™ 6*000* PCR program for the detection of Measles Virus can be divided into following steps:

G. Setting of general assay parameters & reaction volume
H. Thermal Profile & Calibration
I. Cycling profile/ cDNA Synthesis & Initial activation of the Hot Start enzyme
J. Cycling for Amplification of cDNA
K. Adjustment of the sensitivity of the fluorescence channels
L. Starting of the *Rotor Gene*™ run

Program the *RotorGene*™ 6000 for these 5 steps according to the parameters shown in Figures 22-39 below All specifications refer to the *RotorGene*™ 6000 software version 1.7 Please find further information on programming the *RotorGene*™ in the *RotorGene*™ 6000 *Operator's Manual*,. In the illustrations these settings are shown by arrows

## Setting of general assay parameters & Reaction volume.

**Please see to it that you are in advanced mode and then click Hydrolysis Probes.**
On a double click the software will automatically go to the next function. If there is just a single click then click new after highlighting the Hydrolysis Probes.

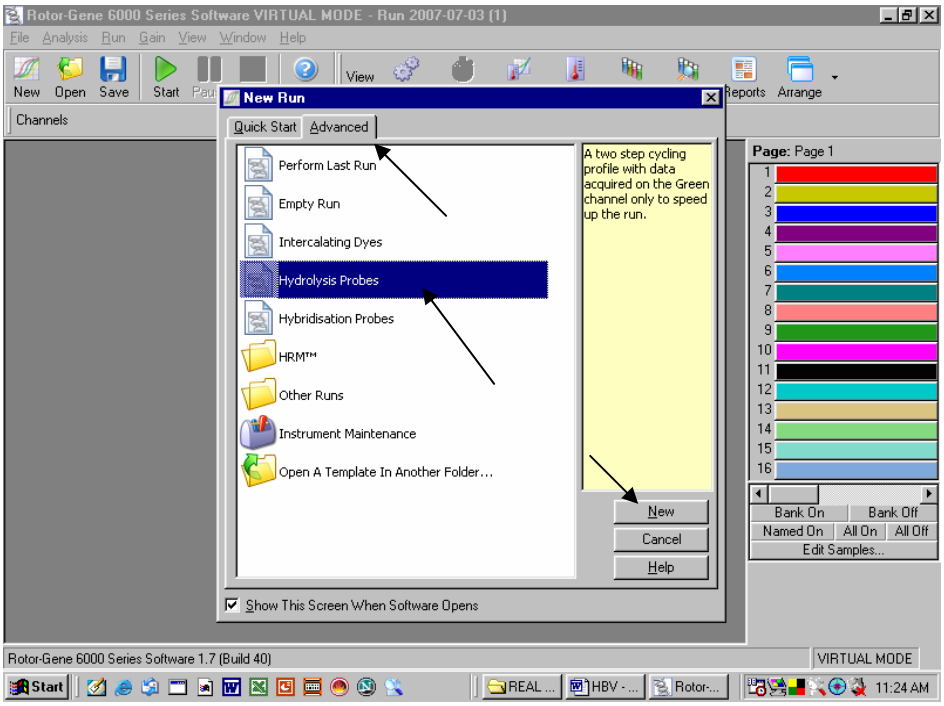


Fig. 22.

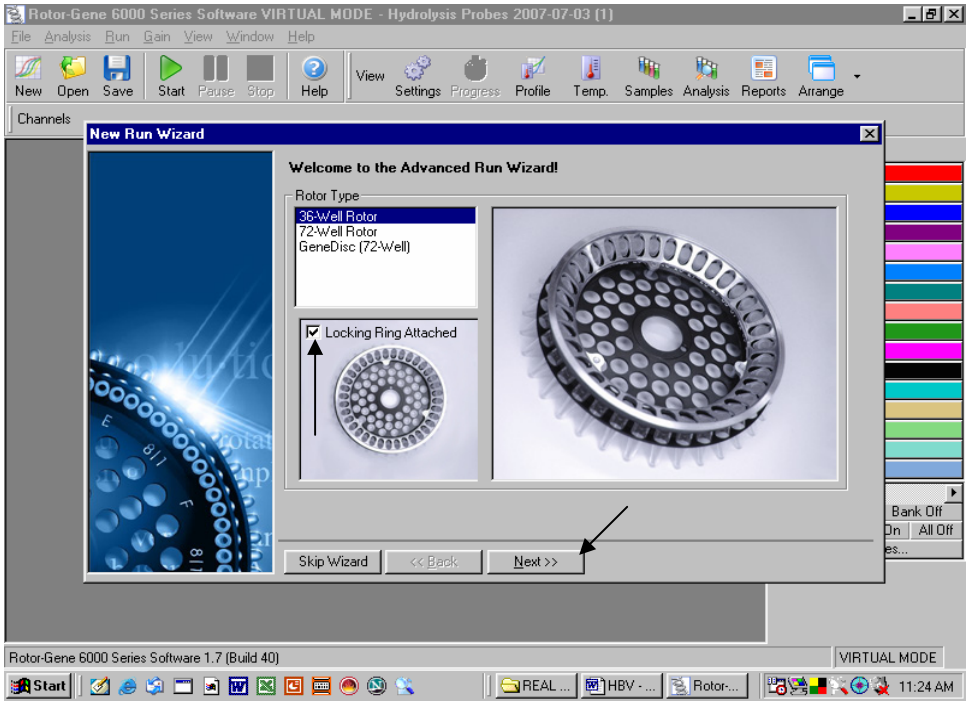



Fig. 23.

First, confirm by clicking in the box as shown in the figure above whether a locking ring has been attached. Then click next to proceed to the next step.

## Confirmation of reaction Volume as follows.

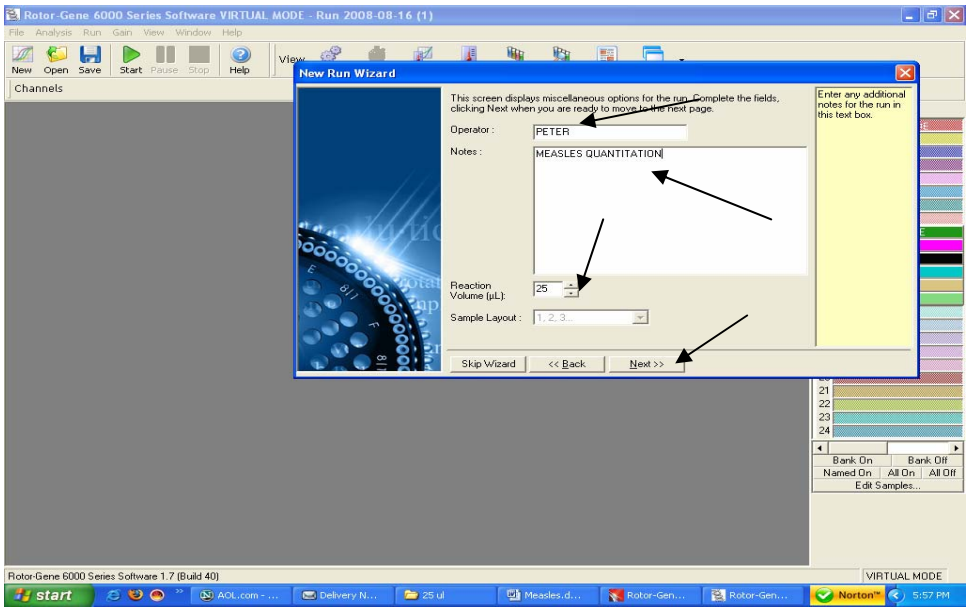



Fig. 24.

- Please click on the volume buttons to make sure that 25µl is reflected in the window as shown above.
- In case required, Operators Name can be Fed into the system.
- Any Notes which need to be either printed into the Report can be typed out in the Box of Notes.
- Then click next and a new window will open as shown below.

## h) THERMAL PROFILE & CALIBRATION:

**Here the thermal profile for the assay will be defined.**

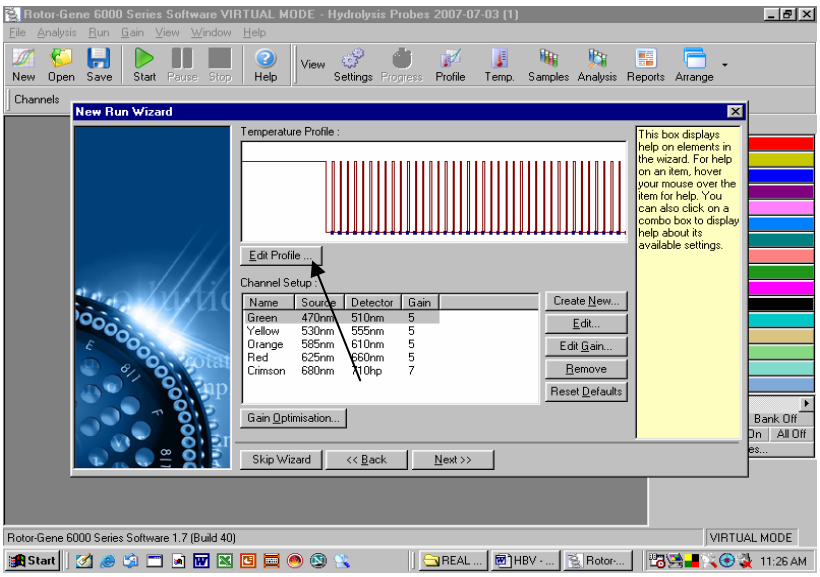



Fig. 25.

Programming the temperature profile is done by activating the button *Edit Profile* in the next *New RUN Wizard* menu window as shown above.

### i) **CYCLING PROFILE: First hold** 50°C for 15 minutes i.e. cDNA synthesis step as below

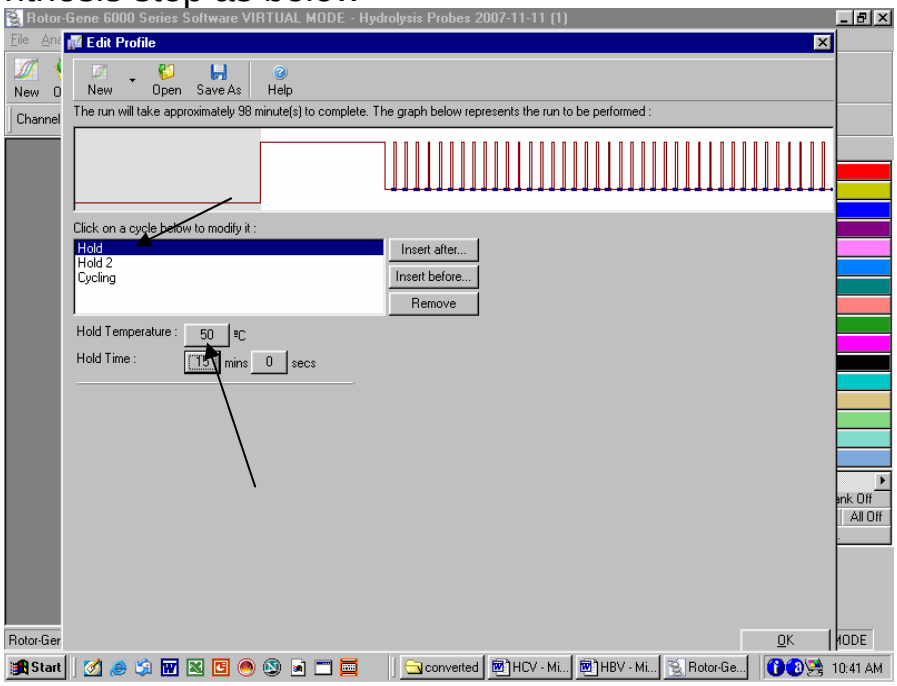



Fig. 26.

**Second hold** 95°C for 10 minutes as below

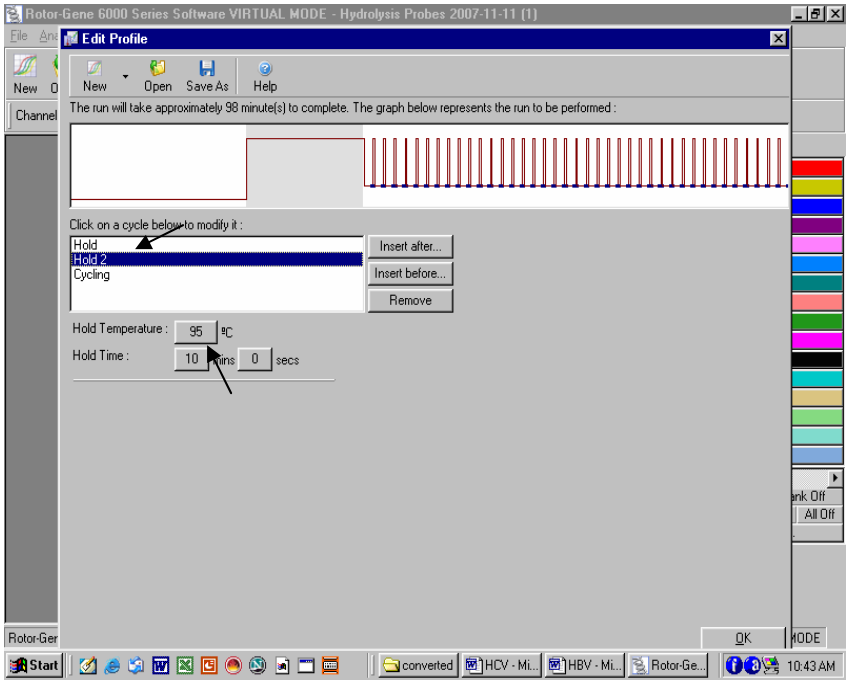



**Fig. 27.** Initial activation of the Hot Start enzyme. Generally the window will open with the Hold Temp as 95°C and the Hold Time as 10 minutes. In case it is different then set the same to as shown above.

# j) Setting the Cycling and acquisition.

When clicked on Cycling the window will open as below.

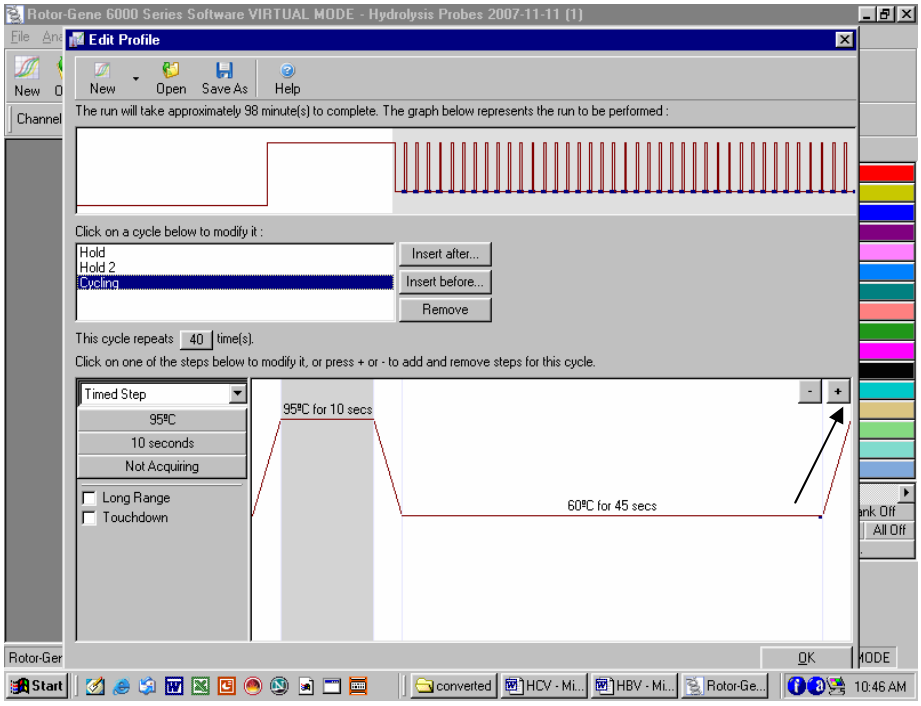



**Fig. 28.**

Click on the Plus sign at the right hand as shown in the figure to make the Cycling a three step process. A new window as shown below will be there.

Setting up of denaturation step in the cycling profile as depicted below i.e. 95°C for 15 seconds.

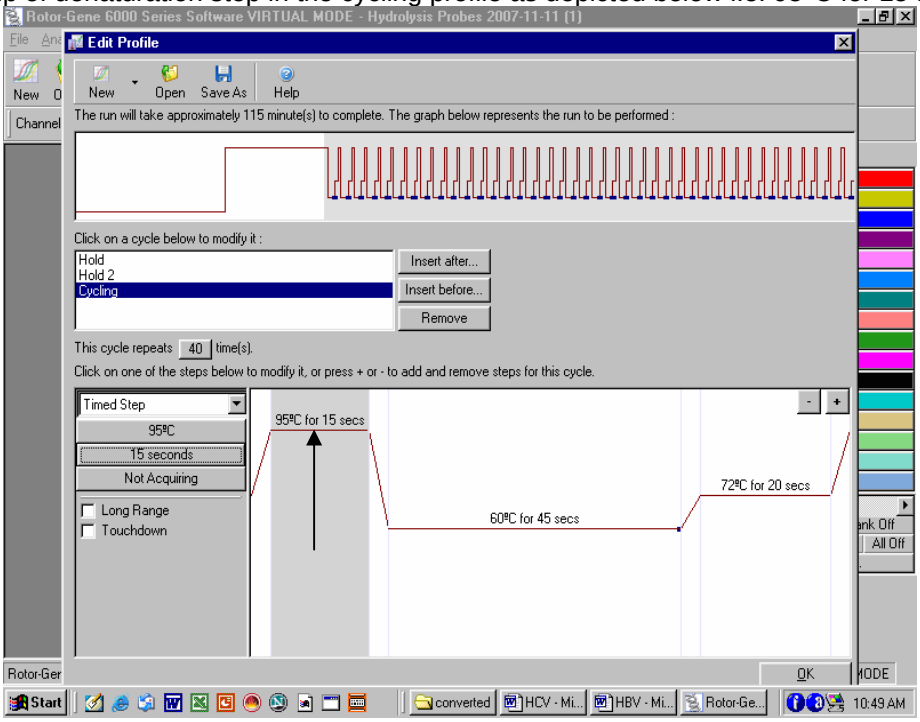



**Fig. 29.**

Setting up of Anneling step in the cycling profile as depicted below i.e. 55°C for 20 Seconds

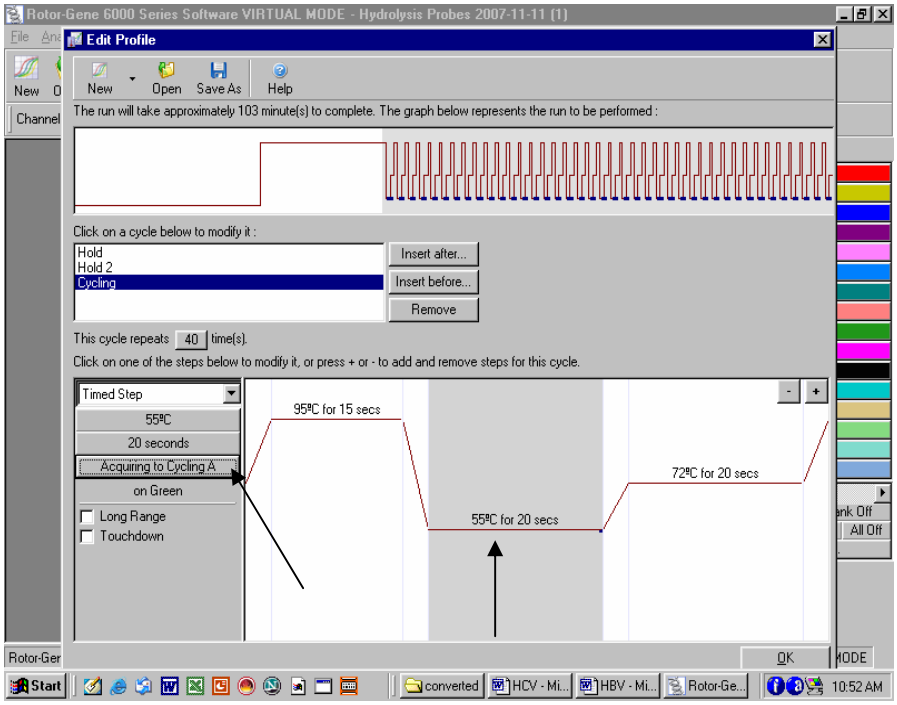



**Fig. 30.**

**After setting the Anneling temperature and the time for anneling click on the "Acquiring to Cycling A" as shown by arrow. A New window will open as shown below.**

**Defining the Data acquiring channel i.e Green (FAM) & Yellow (JOE)**

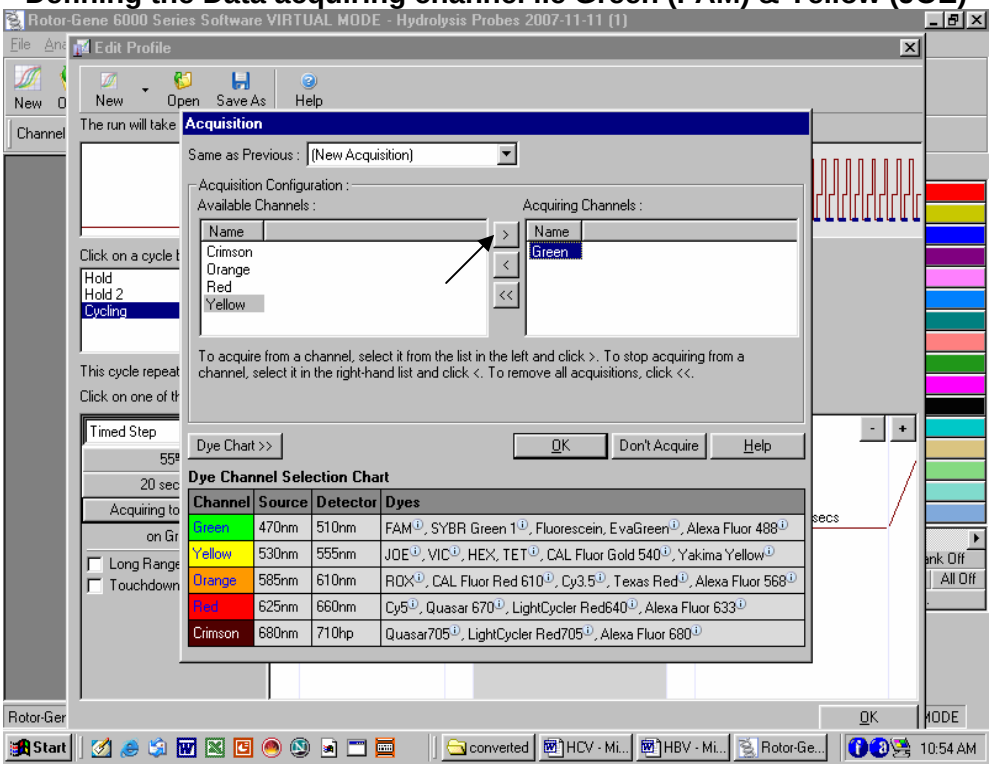



**Fig. 31.**

Highlight the Yellow and then press the right arrow. Just see before shifting the yellow to right that there is no other channel in the right except for Green. In case any other Channel appears besides Green on the right then the same be shifted to the left.

## Confirmation of Channels as shown below.

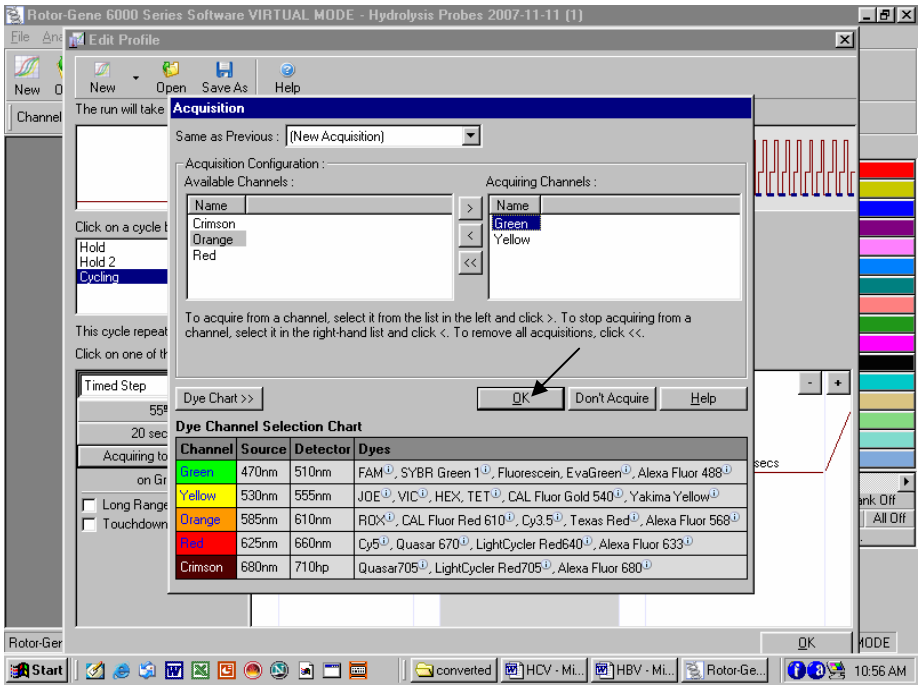



**Fig. 32.**

Once the Yellow and Green Channels are on the Right side then press OK as shown by the arrow.

Setting up of Extension step in the cycling profile as depicted below i.e. 72°C for 15 Seconds

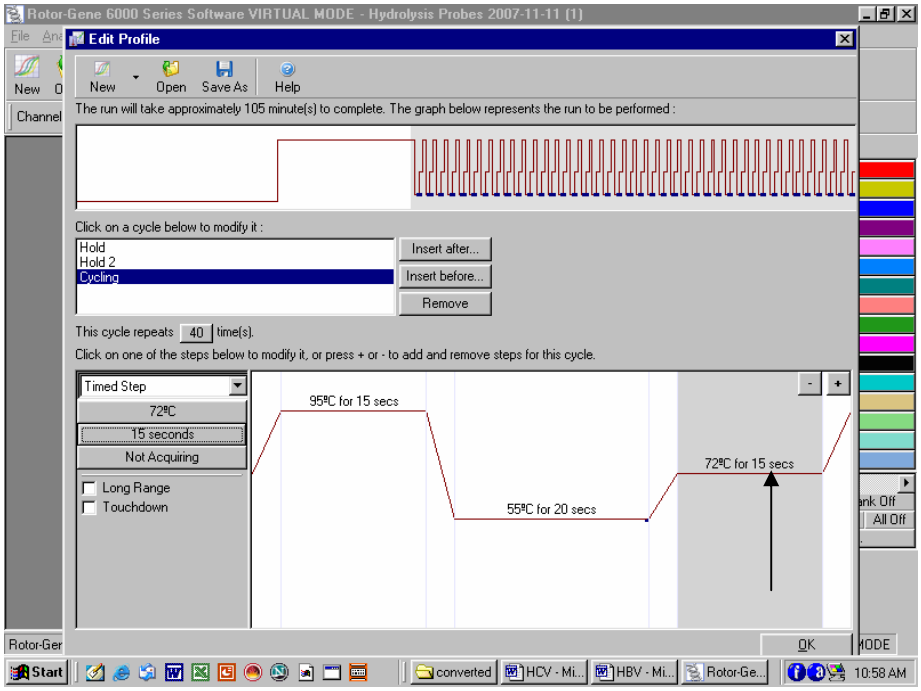



**Fig. 33.**

Setting up of Number of Cycles to 45 cycles in the cycling profile as depicted below.

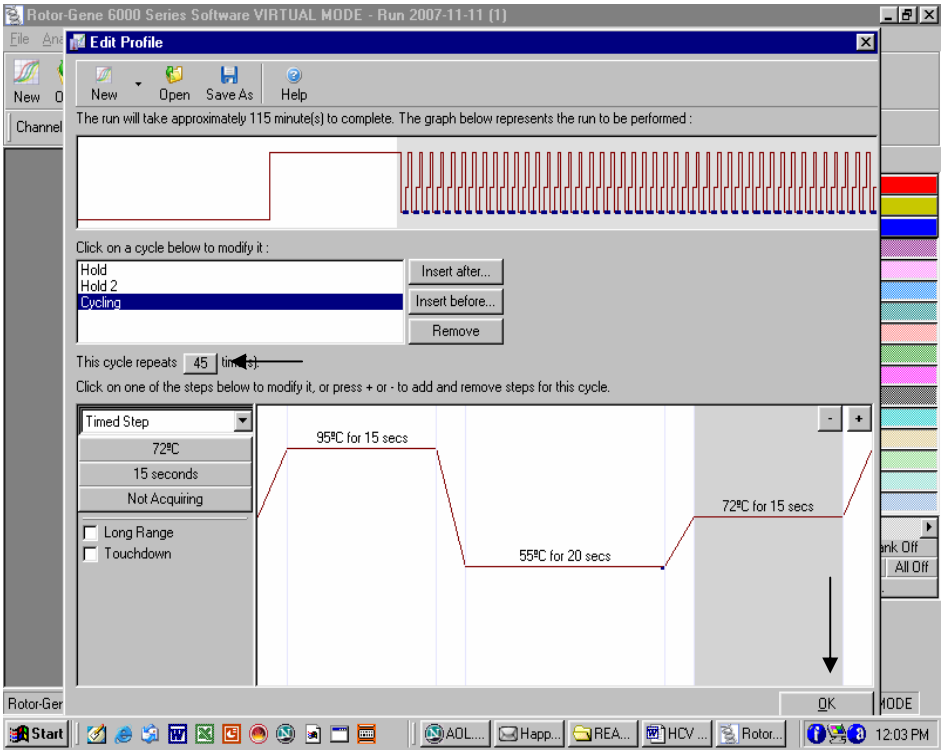



**Fig. 34.**

After setting the number of Cycles Press OK.

k) Setting the gains for the acquiring channel by clicking at the Gain Optimisation button as shown below.

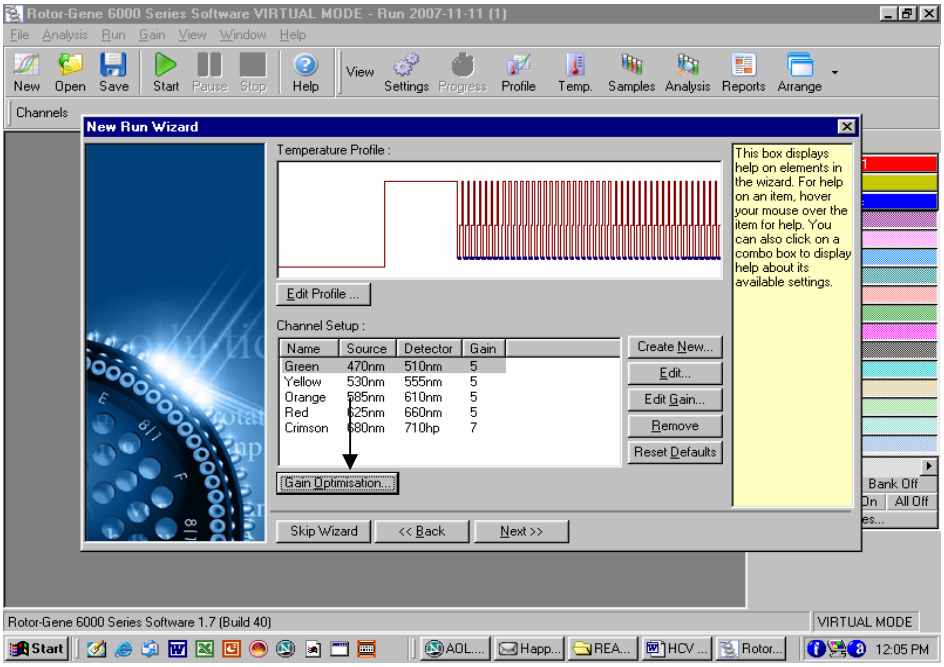



**Fig. 35**

The detection range of the fluorescence channels has to be determined according to the fluorescence intensities in the PCR tubes. This adjustment is done in the menu window *Auto Gain optimization Setup* (activation in menu window *New Experiment Wizard* under Gain Optimization). Please set the temperature to the annealing temperature of the amplification program (compare Fig.36 .

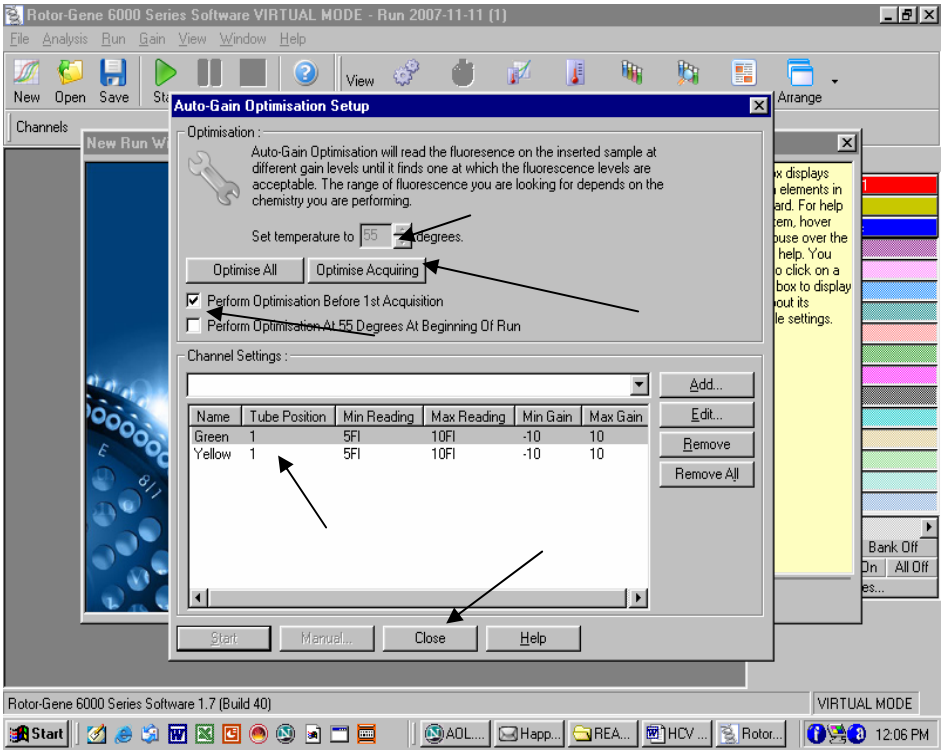



**Fig. 36.**

**The following needs to be done.**

- Click on the Optimise Acquiring
- Click on Set temperature To Adjust the Temperature to 55°C.
- Click on the Box Perform Optimisation before 1st Acquisition.
- Just see that below the channel settings there appear only two channels i.e. Green and Yellow. In case it is different then the channels have not been set properly. Close the window and reset the channels.
- Then Press Close.
- The press Next as shown below.

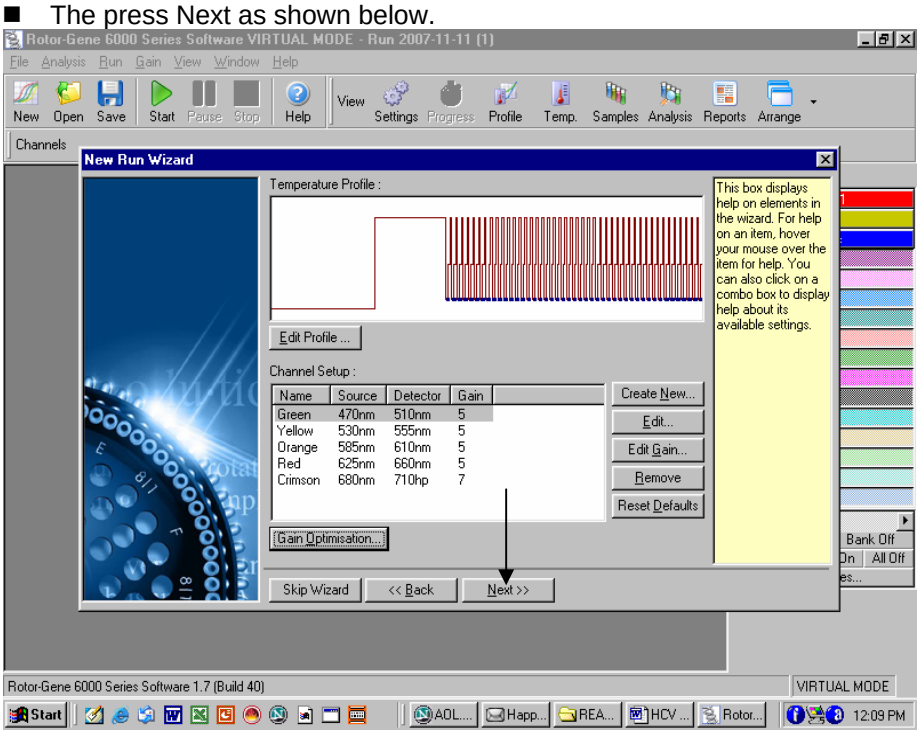



**Fig. 37.**

## L) PRESS Start RUN

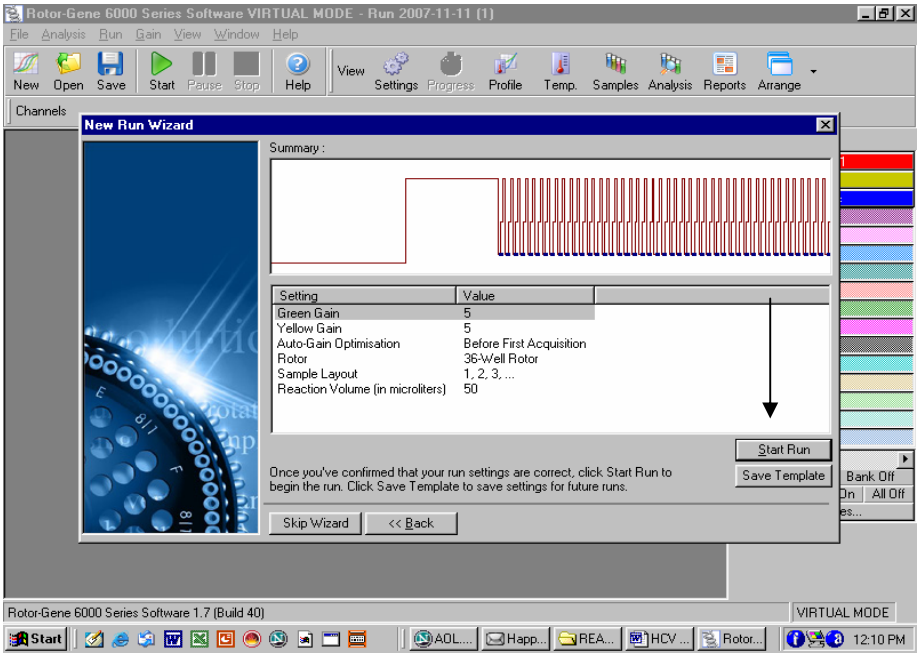



**Fig. 38.**

## Saving the RUN File.

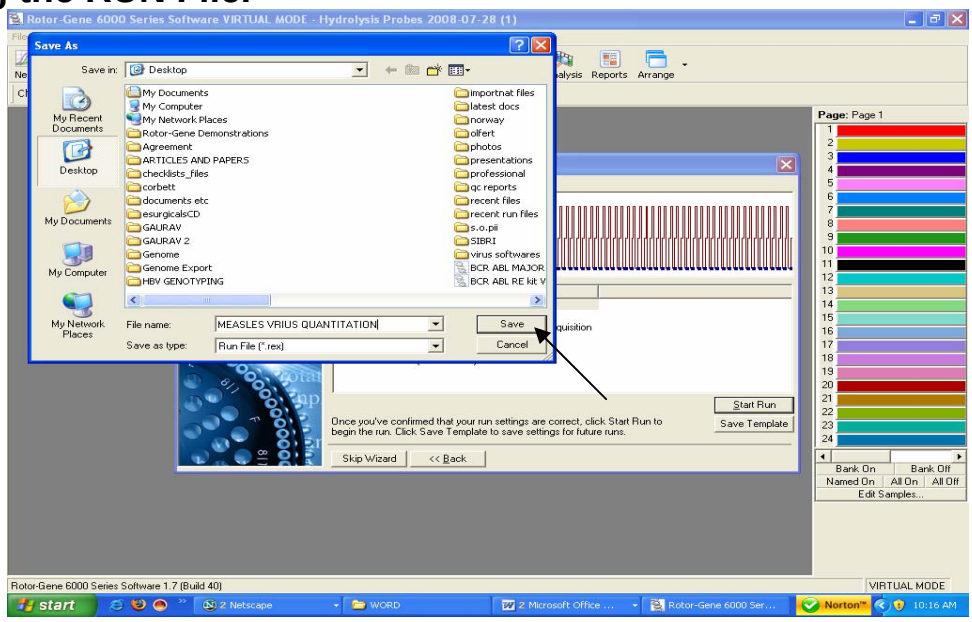



**Fig. 39.**

Store the run file either in my documents or a designated folder as shown above.

The moment save button is clicked after the file name, machine will start.

## 9. a)Generated Data Interpretation & Analysis Rotor Gene 2000/3000

Data analysis is performed with the *RotorGene*™ software according to the manufacturer's instructions (*RotorGene*™ *3000 Operator's* Manual).

The following results are possible:

### A signal is detected in fluorescence channel Cycling A.FAM.

The result of the analysis is positive: The sample contains MEASLES RNA.

In fluorescence channel Cycling A.FAM no signal is detected.

**No MEASLES RNA detectable. It can be considered negative if there is amplification in the Joe Channel. Please refer for details on PCR inhibition in the section PCR inhibition.**

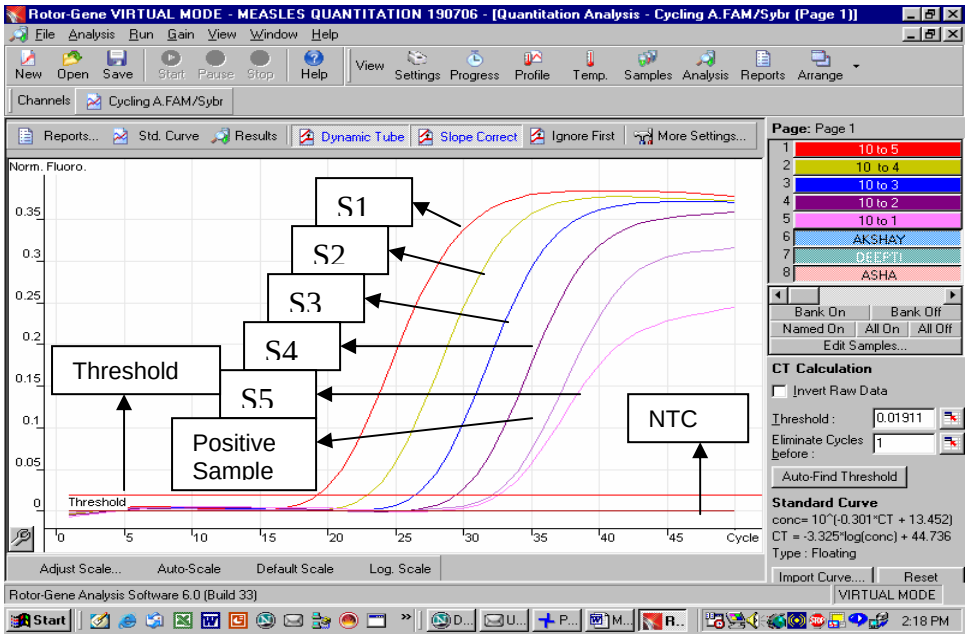
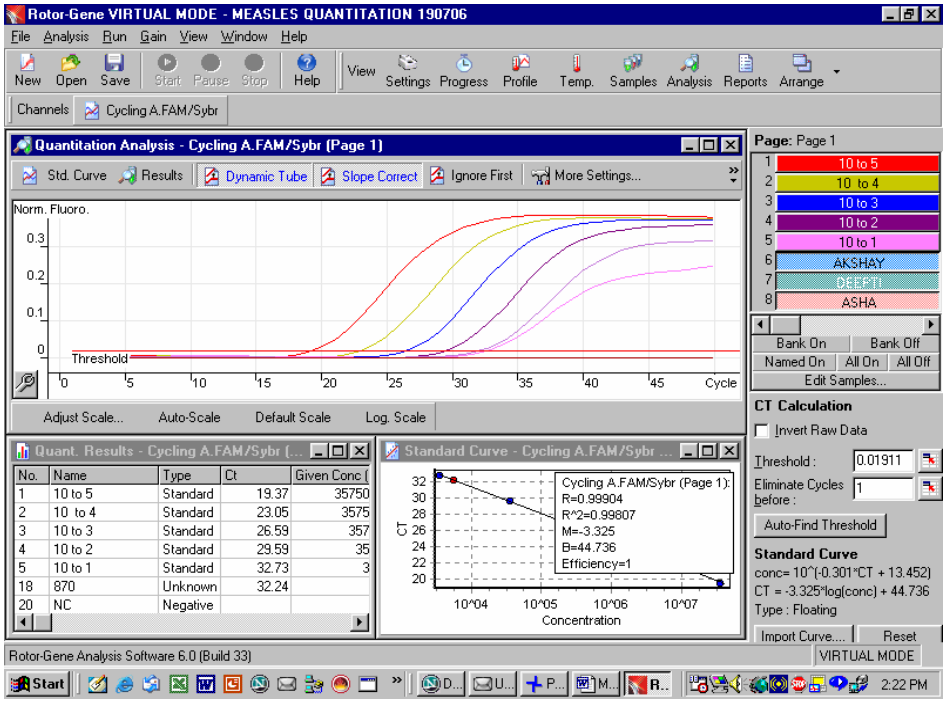



Fig. 40: Detection of the quantitation standards *(MEASLES S 1-5)* in fluorescence channel Cycling A.FAM. NTC: non-template control.

Examples of positive and negative PCR reactions are given in the above figure.




| No. | Name | Type | Ct | Given Conc |
|---|---|---|---|---|
| 1 | 10 to 5 | Standard | 19.37 | 35750 |
| 2 | 10 to 4 | Standard | 23.05 | 3575 |
| 3 | 10 to 3 | Standard | 26.59 | 357 |
| 4 | 10 to 2 | Standard | 29.59 | 35 |
| 5 | 10 to 1 | Standard | 32.73 | 3 |
| 18 | 870 | Unknown | 32.24 | |
| 20 | NC | Negative | | |

Fig. 41.

**Example of analysed data for MEASLES where all the amplification curves can be seen as well as The standard curve, reaction efficiency, M value etc. can be seen and the quantitative data for the samples can be seen.**

## *Inhibition Control gene amplification.*

***Analyze the Joe Channel***

## *PCR Inhibition*

A signal is detected in fluorescence channel Cycling A. Joe: **No PCR inhibition**

In fluorescence channel Cycling A. Joe no signal is detected.

**But signal detected in FAM: The sample is positive for MEASLES RNA.**

In fluorescence channel Cycling A. Joe no signal is detected.

**No signal detected in FAM as well: A possible PCR inhibition has occurred.**

## 9. b) Generated Data Interpretation & Analysis Rotor Gene 6000

Data analysis is performed with the *RotorGene*™ software according to the manufacturer's instructions (*RotorGene*™ 6*000 Operator's* Manual).

The following results are possible:

**A signal is detected in fluorescence channel Cycling A.Green.**

The result of the analysis is positive: The sample contains MEASLES RNA.

In fluorescence channel Cycling A.Green no signal is detected.

**No MEASLES RNA detectable. It can be considered negative if there is amplification in the Yellow Channel. Please refer for details on PCR inhibition in the section PCR inhibition.**

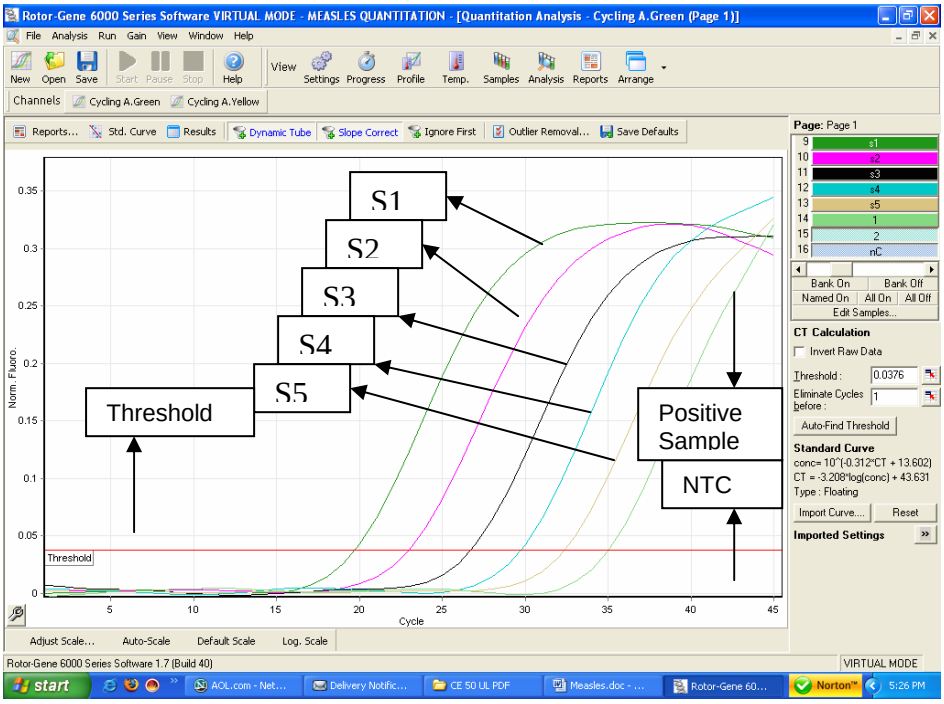



Fig. 42: Detection of the quantitation standards *(MEASLES S 1-5)* in fluorescence channel Cycling A.Green. NTC: non-template control.

Examples of positive and negative PCR reactions are given in the above figure.

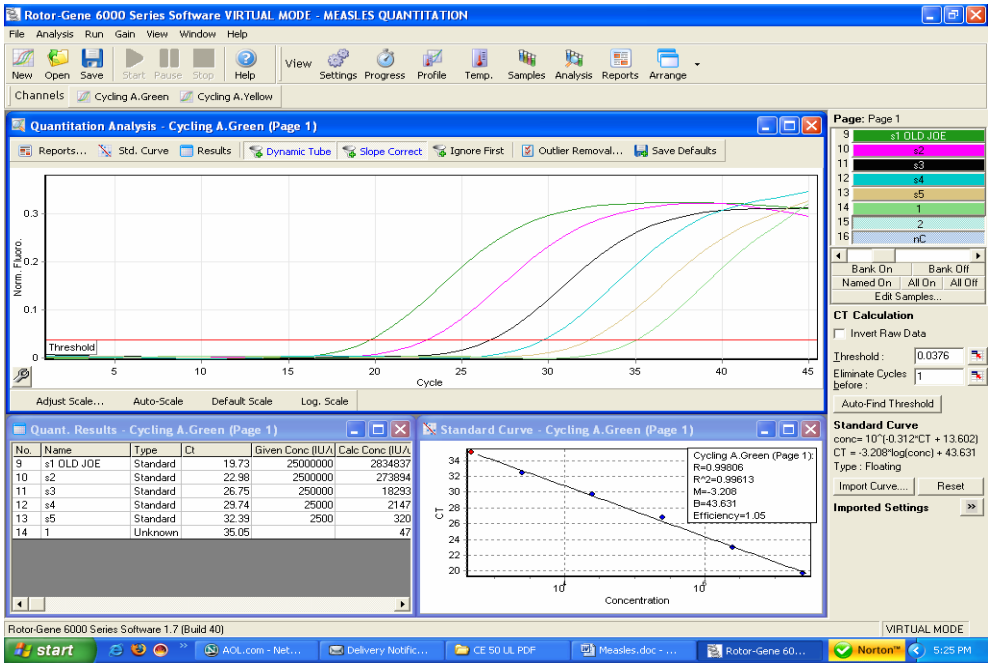



Fig. 43.

**Example of analysed data for MEASLES where all the amplification curves can be seen as well as The standard curve, reaction efficiency, M value etc. can be seen and the quantitative data for the samples can be seen.**

## *Inhibition Control gene amplification.*

***Analyze the Yellow Channel***

## *PCR Inhibition*

A signal is detected in fluorescence channel Cycling A. Yellow: **No PCR inhibition**

In fluorescence channel Cycling A. Yellow no signal is detected.
**But signal detected in Green: The sample is positive for MEASLES RNA.**

In fluorescence channel Cycling A. Yellow no signal is detected.
**No signal detected in Green as well: A possible PCR inhibition has occurred.**

## 10. a) Troubleshooting for Rotor Gene 2000/3000

**1. No signal with positive Standards (MEASLES *S 1-5*) in fluorescence channel Cycling A.FAM.**

- Incorrect programming of the *Rotor-Gene™ 2000/3000.*

  ➔ Repeat the PCR with corrected settings.

**2. Weak or no signal in fluorescence channel Cycling A. FAM:**

- The PCR conditions do not comply with the protocol.

  ➔ Repeat the PCR with corrected settings.

- The MEASLES Super Mix *R1* has been thawed and frozen too often.
- The MEASLES Super Mix R1 has been kept at +4°C for longer than 5 hours.

  ➔ Please mind the storage conditions given in the **Storage.**
  ➔ Repeat the assay using a new MEASLES super mix (R1).

- **The PCR was inhibited.**

➔ Make sure that you use a recommended extraction method (see **8.a. RNA extraction**) and stick closely to the manufacturer's instructions.

## 10. b) Troubleshooting for Rotor Gene 6000

**1. No signal with positive Standards (MEASLES *S 1-5*) in fluorescence channel Cycling A.Green.**

- Incorrect programming of the *Rotor-Gene™ 6000.*

➔ Repeat the PCR with corrected settings.

**2. Weak or no signal in fluorescence channel Cycling A. Green:**

- The PCR conditions do not comply with the protocol.

➔ Repeat the PCR with corrected settings.

- The MEASLES Super Mix *R1* has been thawed and frozen too often.
- The MEASLES Super Mix R1 has been kept at +4°C for longer than 5 hours.

➔ Please mind the storage conditions given in the **Storage.**
➔ Repeat the assay using a new MEASLES super mix (R1).

- **The PCR was inhibited.**

➔ Make sure that you use a recommended extraction method (see **8.a. RNA extraction**) and stick closely to the manufacturer's instructions.

### 11. Specifications

### 11.a Sensitivity and Reproducibility

In order to determine the sensitivity of the ***Geno-Sen's*** *MEASLES Real Time PCR Kit*, a dilution series has been set up from $10^6$ down to $10^0$ Copies/µl of MEASLES RNA and analyzed with the ***Geno-Sen's*** *MEASLES Real Time PCR Kit*. The assays were carried out on three different days in the form of 8-fold determinations. The

results were determined by a probit analysis. The detection limit as determined for ***Geno-Sen's*** *MEASLES Real Time PCR Kit* is consistently 90 Copies/ml. This means that there is 95% probability that 90 copies/ml will be detected.

### 11.b Specificity

In order to check the specificity of the ***Geno-Sen's*** MEASLES Real Time PCR kit, different RNA & DNA listed below were analyzed with ***Geno-Sen's*** MEASLES Real Time PCR Kit. None of these led to a positive signal with the ***Geno-Sen's*** MEASLES Real Time PCR kit. Gene sequence analysis of the amplified region of MEASLES shows a pronounced homology among the various MEASLES strains, and no homology with other RNA. Besides which utmost care has been taken in selection of the primers & probes being used in the kit.

| | | |
|---|---|---|
| Vericella Zoster Virus | Hepatitis B Virus | N. Meningitis |
| Human Herpes Virus 1 & 2 | Hepatitis A Virus | S. Pneumonia |
| Epstein barr Virus | Hepatitis C Virus | JEV |
| Cytomagalovirus | HIV-1 | Mycobacterium tuberculosis |
| Chlamydia pneumonia | HIV 2 | West Nile Virus |
| Parvovirus B 19 | West Nile Virus | Staphylococcus aureus |
| Dengue Virus 1-4 | H. Influenza | Chickungunya Virus |
| Leprosy | Malaria | Scrub typhus |
| B.pseudomallie | Filaria | Leptospira interrogans. |

Further studies are underway on this aspect.

## 12. Warranty::

Products are guaranteed to confirm to the quality and content indicated on each vial and external labels during their shelf life. Genome Diagnostics Pvt. Ltd. obligation and purchaser's rights under the warranty are limited to the replacement by Genome Diagnostics Pvt. Ltd of any product that is shown defective in fabrication, and that must be returned to Genome Diagnostics Pvt. Ltd Freight prepaid, or at Genome Diagnostics Pvt. Ltd. option, replacement of the purchasing price. Any complaint on damaged goods during transport must be directed to the handling or transport agent.

*In Vitro* Diagnostic Medical device, as per the Directive 98/79/EC specifications. This product must be used by qualified professionals only. It is the responsibility of the user to ascertain that a given product is adequate for a given application. Any product not fulfilling the specifications included in the product sheet will be replaced. This warranty limits our responsibility to the replacement of the

product. No other warranties, of any kind, express or implied, including without limitation, implicit warranties of commercialization ability or adequacy for a given purpose, are provided by Genome Diagnostics Pvt. Ltd. Genome Diagnostics Pvt. Ltd will not be responsible for any direct, indirect, consequential or incidental damage resulting of the use, misuses, results of the use or inability to use any product.

## 13. Limitations of product use:

a.) All reagents may exclusively be used for *in vitro* diagnostics.
b.) The product is to be used by personnel specially instructed and trained in for the *in-vitro* diagnostics procedures only.
c.) It is important to pipet the indicated quantities, and mix well after each reagent addition. Check pipettes regularly.
d.) Instructions must be followed Correctly in order to obtain correct results. If the user has any questions, please contact our Technical Dept. (dharam@vsnl.com or at pbpl@vsnl.net ).
e.) This test has been validated for use with the reagents provided in the kit. The use of other Reagents or methods, or the use of equipment not fulfilling the specifications, may render equivocal results. User is responsible for any modifications done in any of the indicated parameters. Compliance with the kit protocol is required.
f.) Detection of RNA depends on the number of RNA present in the sample, and can be affected by sample collection methods, patient-related factors (e.g. age, symptoms), or for infection stage and sample size.
g.) False negative results may be obtained due to polymerase inhibition. It is recommended to perform control reactions to distinguish between inhibition and true negatives. This is achieved by the inhibition Control included in the kit.
h.) Cross contamination between samples and exogenous DNA can only be avoided by following good laboratory practice. Instructions in this document must be strictly followed.
i.) Attention should be paid to expiration dates printed on the kit box and labels of all components. Do not use expired components.

If you have any further questions or problems, please contact our technical support at dharam@vsnl.com OR pbpl@vsnl.net.

## 14. LIST OF GENO-SEN'S RANGE OF REAL TIME PCR KITS

| S.NO. | PRODUCT |
|---|---|
| | |
| 1 | HIV-1 RG quantitative Real time PCR kit. |
| | |
| 2 | HBV RG quantitative Real time PCR kit. |
| | |
| 3 | HCV RG quantitative Real time PCR kit. |
| | |
| 4 | HCV Genotyping 1/2/3/4 RG qualitative Real time PCR kit. |
| | |
| 5 | HEV RG quantitative Real time PCR kit. |
| | |
| 6 | HAV RG quantitative Real time PCR kit. |
| | |
| 7 | JEV RG quantitative Real time PCR kit. |
| | |
| 8 | ENTEROVIRUS RG quantitative Real time PCR kit. |
| | |
| 9 | DENGUE RG quantitative Real time PCR KIT |
| | |
| 10 | HSV 1 & 2 RG quantitative Real time PCR kit. |
| | |
| 11 | CMV RG quantitative Real time PCR kit. |
| | |
| 12 | Hanta Virus RG quantitative Real time PCR kit. |
| | |
| 13 | Measles Virus RG quantitative Real time PCR kit. |
| | |
| 14 | West Nile Virus RG quantitative Real time PCR kit. |
| | |
| 15 | H5 N1 (Bird Flu) RG quantitative Real time PCR kit. |
| | |
| 16 | Chikungunya RG quantitative Real time PCR kit. |
| | |
| 17 | TTV RG quantitative Real time PCR kit. |
| | |
| 18 | SARS RG quantitative Real time PCR kit. |
| | |
| 19 | JC/BK Virus RG quantitative Real time PCR kit. |
| | |
| 20 | MTb Complex RG quantitative Real time PCR kit. |
| | |
| 21 | MTb Complex /MOTT RG quanlitative Real time PCR kit. |
| | |
| 22 | Chlamydia pneumonia RG quantitative Real time PCR kit. |
| | |

| | |
|---|---|
| **23** | **Streptococcous pneumonia RG quantitative Real time PCR kit.** |
| | |
| **24** | **N. Meningitis RG quantitative Real time PCR kit.** |
| | |
| **25** | **H. Influenza RG quantitative Real time PCR kit.** |
| | |
| **26** | **Leprosy RG quantitative Real time PCR kit.** |
| | |
| **27** | **Helicobacter Pylori RG quantitative Real time PCR kit.** |
| | |
| **28** | **Scrub Typhus RG quantitative Real time PCR kit.** |
| | |
| **29** | **B. Pseudomalie RG quantitative Real time PCR kit.** |
| | |
| **30** | **Filaria RG quantitative Real time PCR kit.** |
| | |
| **31** | **Leptospira(pathogenic) RG quantitative Real time PCR kit.** |
| | |
| **32** | **CCL3-L1 RG quantitative Real time PCR kit.** |
| | |
| **33** | **Malaria (P. Vivax) RG quantitative Real time PCR kit.** |
| | |
| **34** | **Bcr/abl Major RG quantitative Real time PCR kit.** |
| **35** | **Bcr/abl Minor RG quantitative Real time PCR kit.** |
| | |
| **36** | **PML/RARA RG quantitative Real time PCR kit.** |
| | |
| **37** | **RARA/PML RG quantitative Real time PCR kit.** |
| | |
| **38** | **GAPDH RG quantitative Real time PCR kit.** |
| | |
| **39** | **β-Actin RG quantitative Real time PCR kit.** |
| | |
| **40** | **β-Globin RG quantitative Real time PCR kit.** |
| | |
| **41** | **Abl gene RG quantitative Real time PCR kit.** |
| | |
| **42** | **Rabies RG quantitative Real time PCR kit.** |
| | |
| **43** | **Factor V Leiden detection RG Real time PCR kit.** |

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