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TITLE:

Quadruplet-Checkerboard: A Modification of the Three-Dimensional Checkerboard for Studying Drug Combinations

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antibiotic combination, checkerboard, four drugs interaction

SUMMARY:

This protocol describes how to study all possible combinations that can be obtained between four drugs in one single experiment. This method is based on the standard 96-well plate micro dilution assay and the calculation of fractional inhibitory concentrations (FICs) to evaluate the results.

ABSTRACT:

The concept of drug-combination therapy is becoming very important mainly with the drastic increase in resistance to drugs. The Quadruplet checkerboard, also called the Q-checkerboard, aims at maximizing the number of possible combinations that can be obtained between four drugs in one experiment to minimize the time and work needed to accomplish the same results with other protocols. This protocol is based on the simple micro dilution technique where the drugs are diluted and combined together in several 96-well plates.

In the first set of 96-well plates, Muller-Hinton broth is added followed by the first required drug (e.g., Cefotaxime here) to serially dilute it. After the first step is done, another set of 96-well plates is used to dilute the second drug (e.g., Amikaci), which will be transferred by removing a specific volume of drug 2 and put in the corresponding wells in the first set of 96-well plates that contains drug one. The third step is done by adding the required concentrations of the third drug (e.g., Levofloxacin), to the appropriate plates in the initial set containing combination of drug 1 and 2. The fourth step is done by adding the required concentrations of the fourth drug (e.g., Trimethoprim-sulfamethoxazol) into the appropriate plates in the first set. Then, *E. coli* ESBL bacterial inoculum will be prepared and added.

This method is important to evaluate all the possible combinations and has a wider range of possibilities to be tested furthermore for *in vivo* testing. Despite being a tiring technique requiring a lot of focus, the results are remarkable and time saving where a lot of combinations can be tested in a single experiment.

INTRODUCTION:

With the increase in resistance due to the overuse and misuse of antibiotics[1,2], the need to develop new drugs and agents to treat bacterial infections has become crucial. New approaches such as developing new drugs are very important to overcome the resistance crisis. However, the pharmaceutical industry is not interested in developing new antimicrobial agents. Moreover, if new drugs are developed, bacteria will keep on evolving and developing resistance against these new drugs[3,4]. Thus, the problem of resistance will not be solved, making the need for another approach a must that should be considered and studied to overcome bacterial resistance.

Drug combination is a very important concept for treating bacterial infections mainly those that are caused by multidrug resistant pathogens[5,6]. It decreases the course of treatment, decreases the dose given; thus, decreasing the toxicity of the given drug, helps in decreasing the rate of resistance development and, in a way, sensitizes the bacteria to the given drugs as described in the concept of collateral sensitivity[5,7,8,9].

Resistance development to one drug requires a single mutation; however, resistance development to a combination of drugs targeting multiple pathways requires several independent mutations that are slowed down by this combination. An example to decreased resistance while using combination therapy is the decreased rate of resistance to Rifampin in Mycobacterium Tuberculosis[10]. Another example is a study done by Gribble et al. that showed the rate of emergence of resistant strains in patients taking Piperacillin alone to be higher than in those taking a combination of carboxypenicillin and aminoglycoside[10]. Studies have shown that resistance development to aminoglycosides in evolving bacteria made these strains sensitive to various other drugs[5]. The combination between the beta-lactam class drug amoxicillin and the lactamase inhibitor clavulanic acid showed success in treating resistant bacterial strains[8].

Decreasing the time of treatment is a good advantage resulting from drug combinations. For example, a therapy of combined penicillin or ceftriaxone with gentamicin for 2 weeks will give the same efficacy given by penicillin or ceftriaxone alone when given for 4 weeks[11]. Combining drugs allows for the usage of lower dosages of drugs that are not effective when given alone such as the Sub-MICs. The example of sulfonamides can be given where the use of triple-sulfonamides minimizes, at lower doses, the toxicity produced which is crystal formation or crystalluria when using insoluble sulfonamides at full doses[12].

Thus, decreasing the dosage given and the time of treatment will eventually decrease the toxicity of the drugs on the body. The idea of developing methods to assess the interaction

between combined drugs is very important. In one study, the results showed that combination therapy is more effective for the treatment of resistant species of *Acinetobacter* and *P. aeruginosa*[8].

Giving drugs in combination

There are different methods by which we can study drug combinations, such as the checkerboard method, the time-kill curve method, and the E-test method[13]. The checkerboard method can study all the possible combinations between the two drugs in question in one experiment itself. In addition, it was developed to study a combination of three drugs[14]. Now, we extend this to study a combination of four drugs mainly for the treatment of multidrug-resistant pathogens.

The time-kill curve assay is usually performed to test for the bactericidal effect of a certain drug. It was also used to test for the effect of drug combinations where several drugs are combined at specific concentrations. This protocol requires the preparation of several sterile tubes or cups where in each cup we add the broth, combination of drugs, and the required bacterial strain. After incubation and recording of the optical density at several time points, the results are compared with the normal growth rate of the used strain to see whether the growth rate increased, decreased, or did not change[13].

E-test method is usually done to test for the minimal inhibitory concentration (MIC) where a strip containing a gradient concentration of the drug in question is put on an inoculated plate. It was also used to test the combination between two drugs where two strips are added to the plate in a perpendicular manner intersecting at their MICs[13].

According to literature, there is no gold standard to define and study synergy; thus, it is difficult to assess which one of the methods used to study combination is better and which one produces better and more reliable results mainly[13]. However, Time-kill assay is labor intensive, time consuming, and expensive[15,16], while the E-test method is developed to study a combination between two drugs only. Checkerboard can study all the possible combinations between the two drugs tested and this is why this technique has been chosen to be developed.

PROTOCOL:

1. **Preparation steps**

1.1. Prepare Muller-Hinton broth (MHB) by adding 25 g of MH broth to 1 L of distilled water and mix. Autoclave at 121 °C for 2.5 h. Then, store the autoclaved media at room temperature or in the fridge.

1.2. Subculture the bacteria in question (*E. coli* ESBL) on the agar media using the four-quadrant streaking method and incubate overnight at 37 °C.

1.2.1. Using a sterile loop, take one colony and spread it in the first half of the MacConkey agar plate by doing close parallel streaks.

1.2.2. Using the loop, spread the bacteria in the second quadrant by streaking it from the first quadrant.

1.2.3. From the second quadrant, extend the streaks in the third quadrant using close parallel streaks.

1.2.4. Spread the bacteria in the center of the fourth quadrant by streaking it from the third quadrant.

2. **Panel preparation**

2.1. Place four 96-well plates next to each other to form a square. Using a tape, tape their bottom together.

2.2. Repeat this step to obtain four panels each containing 4 plates and name them A1, A2, A3, and A4.

2.3. Add 50 µL of MH broth to the wells between column 2 and column 11 in the 16 96-well plates of the four panels.

2.4. Add 200 µL of MH broth to the well H12 serving as the negative control well in the 16 96-well plates of the four panels.

2.5. Add 150 µL of MH broth to the wells A1 and H1 serving as positive control wells in the 16 96-well plates of the four panels.

3. **Drug 1, Cefotaxime, serial dilution**

3.1. To a conical tube, add 15 mL of sterile dH_2O.

3.1.1. Calculate the volume to be removed from the stock solution of the drug following the formula $C_1V_1 = C_2V_2$. Thus, $V_1 = (C_2 \times 15\ mL) / C_1$.

NOTE: In our case, the Cefotaxime stock solution is 10^5 µg/mL and C_2 is 256 µg/mL; thus, V_1 = 38.4 µL.

3.2. Remove the calculated volume from the 15 mL of sterile dH_2O, and then add the drug.

3.3. Pipette 50 µL of the prepared drug solution into each well in column 11 and column 12 except H12.

3.4. Start the serial dilution by removing 50 µL from column 11 and putting it into the corresponding wells in column 10, and then from 10 until reaching column 2 where the 50 µL taken from column 2 will be discarded.

3.5. Repeat steps 3.4 and 3.5 for all the 16 96-well plates of the four panels.

4. **Drug 2, Amkacin, serial dilution**

4.1. To a conical tube, add 10 mL of sterile dH_2O.

4.2. Calculate the volume to be removed from the stock solution of the drug following the formula $C_1V_1 = C_2V_2$. Thus, $V_1 = (C_2 \times 10\ mL) / C_1$.

NOTE: In our case, the Amikacin stock solution is 10^3 µg/mL and C_2 is 64 µg/mL; thus, V_1 = 64 µL.

4.3. Remove the calculated volume from the 10 mL of sterile dH_2O, and then add the drug.

4.4. Take eight separate 96-well plates.

4.5. To each plate, add 100 µL of MHB to the wells between rows G and B.

4.6. Add 100 µL of the previously prepared drug 2 solution to the wells of row G.

4.7. Dilute serially from row G to row B by taking 100 µL from each well and finally discard the 100 µL from the wells of row B.

4.8. Repeat steps 4.5, 4.6, and 4.7 to prepare eight plates.

5. **Transfer of drug 2 to the four panels**

5.1. Pipette 50 µL of drug 2 from the wells between rows G and B into the corresponding wells in each plate in the four panels. One prepared 96-well plate contains 100 µL of drug 2 that is enough for two plates in one panel.

6. **Drug 3, Levofloxacin, addition**

6.1. To four different conical tubes, add 14 mL of sterile dH_2O.

6.2. Calculate the volume to be removed from the stock solution of the drug following the formula $C_1V_1 = C_2V_2$. Thus, $V_1 = (C_2 \times 14\ mL) / C_1$.

NOTE: In our case, Levofloxacin is prepared in four different concentrations from a stock solution of 5×10^3 µg/mL.

C_1 = 2 μg/mL, V_1 = 5.6 μL
C_2 = 4 μg/mL, V_1 = 11.2 μL
C_3 = 8 μg/mL, V_1 = 22.4 μL
C_4 = 16 μg/mL, V_1 = 44.8 μL

6.3. Remove the calculated volume from the 14 mL of sterile dH_2O from each tube, and then add the drug.

6.4. After preparing the required concentrations of the third drug, take 50 μL and add it to the corresponding wells between rows B and G and columns 2 and 12 in the corresponding plate in each panel where C1 corresponds to the four P1 plates in the four panels, C2 corresponds to the four P2 plates in the four panels, C3 corresponds to the four P3 plates in the four panels, and C4 corresponds to the four P4 plates in the four panels.

7. **Drug 4, Trimethoprim-sulfamethoxazole, addition**

7.1. To a conical tube, add 14 mL of sterile dH_2O.

7.2. Calculate the volume to be removed from the stock solution of the drug following the formula $C_1V_1 = C_2V_2$. Thus, $V_1 = (C_2 \times 14\ mL) / C_1$.

NOTE: In our case, trimethoprim-sulfamethoxazole is prepared in four different concentrations from a stock solution of 48 x 10^3 μg/mL.
C_1 = 512 μg/mL, V_1 = 149.33 μL
C_2 = 1024 μg/mL, V_1 = 298.66 μL
C_3 = 2048 μg/mL, V_1 = 597.33 μL
C_4 = 4096 μg/mL, V_1 = 1 194.66 μL

7.3. Remove the calculated volume from the 14 mL of sterile dH_2O of each tube, and then add the drug.

7.4. After preparing the required concentrations of the fourth drug, take 50 μL and add it to the corresponding wells between rows B and G and columns 2 and 12 in the four plates in the corresponding panel where C1 corresponds to panel 1, C2 corresponds to panel 2, C3 corresponds to panel 3, and C4 corresponds to panel 4.

8. **Preparation and addition of bacterial inoculum *E. coli* ESBL**

8.1. Using a sterile loop, transfer one colony of the bacterial isolate *E. coli* ESBL previously cultured on a plate into 2 mL of sterile MHB and vortex.

8.2. Check for the turbidity where it should be 0.5 McFarland using a densitometer.

8.3. Add 80 mL of sterile MH broth to a sterile urine cup.

8.4. Add bacterial inoculum from the 0.5 McFarland inoculum to the urine cup following $C_1V_1 = C_2V_2$, where $V_1 = (10^6 \times 80\ mL) / 10^8 = 800\ \mu L$.

8.5. Pipette 50 µL of the inoculum solution 10^6 CFU/mL into each well except H12, which is the sterility control well.

8.6. Incubate the panels at 37 °C overnight.

8.7. After incubation, add 50 µL of Iodotetrazolium to record the growth in the wells.

9. **Protocol for the FIC template (Supplemental File)**

9.1. Write the highest concentration of drug 1 (Cefotaxime) in the yellow cell in panel A.

9.2. Write the highest concentration of drug 2 (Amikacin) in the yellow cell in panel B.

9.3. Write the highest concentration of drug 3 (Levofloxacin) in the yellow cell in panel C.

9.4. Write the highest concentration of drug 4 (Trimethoprim-sulfamethoxazole) in panel D.

9.5. Trace the Redline (Growth/no Growth interface) by highlighting the wells having growth in red.

9.6. Write the MIC of drug 1 in the table of drug 1 (ATB1).

9.7. Write the MIC of drug 2 in the table of drug 2 (ATB2).

9.8. Write the MIC of drug 3 in the table of drug 3 (ATB3).

9.9. Write the MIC of drug 4 in the table of drug 4 (ATB4).

9.10. To calculate FIC for ATB1

9.10.1. Determine the wells on the Growth/no Growth interface.

9.10.2. In table ATB1, double click on the cell next to FIC1 and drag the yellow cell on the left of panel A to the first selected well.

9.10.3. Repeat step 9.10.2 for every selected well where well 1 corresponds to FIC1, well 2 corresponds to FIC2, and so on.

9.11. To calculate the FIC for ATB2

9.11.1. In table ATB2, double click on the cell next to FIC1 and drag the yellow cell on the left of panel B to the first pre-selected well.

9.11.2. Repeat step 9.11.1 for every pre-selected well.

9.12. To calculate the FIC for ATB3

9.12.1. In table ATB3, double click on the cell next to FIC1 and drag the yellow cell on the left of panel C to the first pre-selected well.

9.12.2. Repeat step 9.12.1 for every pre-selected well.

9.13. To calculate the FIC for ATB4

9.13.1. In table ATB4, double click on the cell next to FIC1 and drag the yellow cell on the left of panel D to the first pre-selected well.

9.13.2. Repeat step 9.13.1 for every pre-selected well.

9.14. In the table labeled ATB1+2+3+4, sum the FIC1 of each ATB automatically. The same will occur for the other FICs (FIC2, FIC3, and so on).

9.14.1. In the cell containing ΣFIC and highlighted in yellow, double click on it and select the summed FICs from table ATB1+2+3+4.

9.15. Repeat these steps for each of the nine sheets representing the nine plates.

NOTE: In the sheet FIC all, the table will show the final summed FIC with the interpretation of the obtained value.

10. **MIC determination using the microdilution assay for the four drugs**

10.1. Label four different rows with the abbreviation of each tested drug. For example, CTX for Cefotaxime, AMK for Amikacin, LEVO for Levofloxacin, and SXT for Trimethoprim-sulfamethoxazole.

10.2. Pipette 200 µL of sterile Muller Hinton broth into well number 1 and well number 12 in each used row. Well number 12 will serve as the negative control well.

10.3. Pipette 100 µL of sterile Muller Hinton broth to the wells 2 till 11 in each used row.

10.4. Calculate the volume of each drug to be added using the formula $C_1V_1 = C_2V_2$. Thus, $V_1 = (C_2 \times 4 \times V_2) / C_1$. V_2 is the final volume in the wells which is 200 µL, C_1 is the concentration of the stock solution, and C_2 is the initial concentration that we need to have in the first well.

NOTE: Here, we use the following:
Cefotaxime: $C_1 = 10^5$ µg/mL, where we dilute it to 10^4 µg/mL, C_2 = 256 µg/mL; thus, V_1 = 20.48 µL
Amikacin: $C_1 = 10^3$ µg/mL, C_2 = 64 µg/mL; thus, V_1 = 51.2 µL
Levofloxacin: $C_1 = 5 \times 10^3$ µg/mL, where we dilute it to 5×10^2 µg/mL, C_2 = 16 µg/mL; thus, V_1 = 25.6 µL
Trimethoprim-Sulfamethoxazole: $C_1 = 48 \times 10^3$ µg/mL, C_2 = 4096 µg/mL; thus, V_1 = 68.26 µL

10.5. Pipette the required volume for each drug in the first well of the corresponding row after removing the same volume from the 200 µL broth to obtain a total volume of 200 µL after the addition of the drug.

10.6. Serially dilute by removing 100 µL from well 1 into well 2 and so on until reaching well 10 where the 100 µL removed from well 10 will be discarded. Note that well 11 serves as the positive control well.

10.7. Pipette 100 µL of 10^6 prepared bacterial inoculum into each well in each used row except for well number 12 serving as the negative control.

10.8. Incubate at 37 °C overnight.

REPRESENTATIVE RESULTS:

Figure 2A represents the results obtained by combining Cefotaxime and Amikacin with specific concentrations of Levofloxacin and Trimethoprim-sulfamethoxazole. We can see in the left part of the figure the four plates that are schematically presented with the concentrations of the drugs in the right part of the figure. The arrows represent the wells on the Growth/no Growth interface. The colored wells are the wells that contain growth. We notice that the fourth plate does not contain growth in the quadrant containing the combination. This is because in this plate we have the MIC of Levofloxacin that will inhibit the growth. In this figure, we can see that the MIC of the Cefotaxime is obtained in the well A8, which is equal to 32 µg/mL. The MIC of Amikacin is obtained in the well E1, which is equal to 16 µg/mL. An inhibition effect is seen in the row containing 1/2 MIC of Amikacin (row D) in addition to several subMICs of Cefotaxime and Levofloxacin in addition to 1/8 MIC of Trimethoprim-sulfamethoxazole. This inhibition of bacterial growth in wells containing subMIC concentrations might be a form of synergism between these concentrations of the four drugs.

Figure 2B represents the results obtained by combining Cefotaxime and Amikacin with specific concentrations of Levofloxacin and Trimethoprim-sulfamethoxazole. We can see in the left part of the figure the four plates that are schematically presented with the concentrations of the

drugs in the right part of the figure. The arrows represent the wells on the Growth/no Growth interface. The colored wells are the wells that contain growth. Follow the same interpretation for the fourth plate. In the panel represented by this figure, we can see that the inhibition pattern of bacterial growth occurred in row D also, where the wells contain subMICs of Cefotaxime and levofloxacin, 1/2 MIC of Amikacin and 1/4 MIC of Trimethoprim-sulfamethoxazole.

Figure 2C represents the results obtained by combining Cefotaxime and Amikacin with specific concentrations of Levofloxacin and Trimethoprim-sulfamethoxazole. We can see in the left part of the figure the four plates that are schematically presented with the concentrations of the drugs in the right part of the figure. The arrows represent the wells on the Growth/no Growth interface. The colored wells are the wells that contain growth. Follow the same interpretation for the fourth plate. As for the inhibition pattern in this panel, we can see that in rows C and D growth is not seen. This means that in the wells contain several subMICs of Cefotaxime and Levofloxacine in addition to 1/2 MIC of Trimethoprim-sulfamethoxazole and 1/4 MIC and 1/2 MIC of Amikacin.

Figure 2D represents the results obtained by combining Cefotaxime and Amikacin with specific concentrations of Levofloxacin and Trimethoprim-sulfamethoxazole. We can see in the left part of the figure the four plates that are schematically presented with the concentrations of the drugs in the right part of the figure. The arrows represent the wells on the Growth/no Growth interface. Follow the same interpretation for the fourth plate. We can see that only in row A and column 1 we have colored wells meaning growth. This is because in this panel we have the MIC of trimethoprim-sulfamethoxazole that will totally inhibit the growth.

FIGURE AND TABLE LEGENDS:

Figure 1: Schematic of the Q-checkerboard setup and panels and a map of how the drugs are added.

Figure 2: The experimental results obtained in trial 1 for certain combinations tested.

DISCUSSION:

The Quadruplet Checkerboard method resembles the checkerboard and the three dimensional checkerboard in its protocol. However, certain crucial steps should be taken into consideration to avoid errors during the experiment.

Make sure to test for the MIC of each drug against the tested isolate before starting the protocol to know what are the concentrations that are needed to start the dilutions with for drug 1 and drug 2 that need to be serially diluted in the plates. Concerning drug 3 and drug 4, MIC should also be known to calculate the concentrations needed to be tested (1/8 MIC, 1/4 MIC, 1/2 MIC, and MIC). There are a lot of methods to determine the MIC, yet the best is to determine it with the microdilution technique since the Q-checkerboard protocol also uses the microdilution assay for serial dilution.

In the first step, while taping the plates, make sure the bench is clean and cover the plates with sterile covers to avoid contamination. It is important to note that this protocol can be done using four 96-well plates representing the four panels, where each plate is divided into four smaller quadrants. However, the number of dilutions will be minimized for the first and second drug. In addition, one can also use deep well 384-well plates instead of taping four plates together. However, it was not available when we did the experiments. Note that when choosing the plate to be used, make sure to check the capacity of each well since the final volume in the well will be 250 µL.

Moreover, the number of plates in each panel and the number of panels depends on the number of dilutions that are required for the third and fourth drug. For example, in this experiment, four dilutions of the third drug and four dilutions of the fourth drug were required (1/8 MIC, 1/4 MIC, 1/2 MIC, and MIC); thus, we had four plates in each panel and four panels.

The dilution of the first drug occurs in the plates of the panels according to the columns. However, the dilution of the second drug occurs in separate plates according to the rows. The third and fourth drugs are not serially diluted. However, each concentration used is prepared in a separate tube and added to each well in a specific volume. It is important to note that the wells containing the four drugs are present in the quadrant between rows G and B and columns 2 and 12 only. The checkerboard and the three-dimensional checkerboard protocols were not filmed or written in this manuscript because they are known protocols and the purpose of this manuscript is to talk about the Q-checkerboard protocol. In the checkerboard technique, row A contains only drug 1; thus, showing the MIC of drug 1. Column 1 contains only drug 2; thus, showing the MIC of drug 2.

This concept is kept in the Q-Checkerboard protocol where MIC of drug 1 is still shown in row A and MIC of drug 2 is still shown in column 1. In addition to this, the two added drugs present their MIC in the experiment. Drug 3 has the P4 plate in each panel where the MIC of drug 3 is added to all the wells so we should not observe growth in this plate. Similarly, drug 4 has A4 panel where the MIC of drug 4 is added to all the wells in all the plates in panel 4 so no growth should be observed in this panel.

The growth in the plates is recorded based on the turbidity in the wells, where the turbid wells are considered to have growth. In addition to the turbidity, 50 µL of Iodotetrazolium is added and left for few minutes. A change in color to pink means that there is growth.

This method has certain limitations. It requires hard work and focus. Pipetting errors could occur since this technique is based mainly on pipetting. The FIC calculations are considered a limitation in this case since we are dealing with four values not two or three. Adding a value will increase the value of the FIC in the well; thus, the values of FIC that determine synergism, indifference, and antagonism must be reconsidered.

FIC values can change between several references concerning the standards by which synergism, antagonism, and indifference are defined. Certain references state that an FIC of 0.5

and less is considered synergism[13], while others state that an FIC less than 0.8 is considered synergism[16]. Another reference states that an FIC less than 1 is considered synergism[17]. Due to the instability and conflict in defining a unified standard FIC of synergism, we considered 1 to be our reference.

The final FIC is calculated by adding the FIC values of each plate (9 FICs) and dividing it by the number of plates which is 9. It is important to note that panel 4 is not considered in the results since it contains the MIC of the fourth drug so the inhibition will be the work of a single drug. Additionally, plate 4 in each panel is also not considered since it contains the MIC of drug 3 where the inhibition in this plate will be the act of drug 3 alone. Thus, we end up with 9 plates (16 - (4 + 3)).

For each plate, the FICs are calculated for the wells on the Growth/no Growth interface according to the following formula: (MIC of drug 1 in combination / MIC of drug 1 alone) + (MIC of drug 2 in combination / MIC of drug 2 alone) + (MIC of drug 3 in combination / MIC of drug 3 alone) + (MIC of drug 4 in combination / MIC of drug 4 alone). Then, the number obtained is divided by 4. This formula is done for each well on the Growth/no Growth interface in the same plate. Then, all the FICs of the same plate are summed together to obtain the FIC of this plate. Finally, as mentioned before, the 9 final FICs of each plate are added and divided by 9 to obtain the final FIC that will be interpreted.

An FIC less than 1 is considered synergistic where it has a certain degree of synergism: it is either slightly synergistic (close to one) or more synergistic (when it moves toward 0.5 and less). This calculation and interpretation are simply done using an FIC template that we developed. We just enter the concentrations, pick the wells on the Growth/no Growth interface to calculate the FICs, and we will obtain the final FIC that is interpreted according to the criteria mentioned.

This method allows the testing of all possible combinations that can be done using four drugs in one experiment which can be done in one day. The results are obtained the next day. Whereas, by the time kill curve assay, more time, work materials, and lab workers are needed to test the same number of combinations, since each set of combinations is tested alone in a single tube or cup making it time consuming. This method can be used not only to test antibacterial drug combinations, but to test all types of drugs used to treat diseases and needs to be tested in combination. It can be used also to test a combination of drugs and plant extracts or even a combination of only plant extracts. The point is that this method can be used to test not only specific drugs, but everything that can be combined.

Several limitations accompany this method. Pipetting skills are very important while performing this assay and any error that may occur while pipetting and serial dilution can negatively affect the results and might lead to false negative or false positive results. Thus, any technological advances regarding pipetting machines and robots will be of a great help in performing this assay. This method requires a lot of calculations and dilutions so any single error might change the outcome of the results. This technique provides insights on the inhibition effect only and

not the killing effect. This technique studies the inhibition at a single time point and not over time.

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DISCLOSURES:

None.

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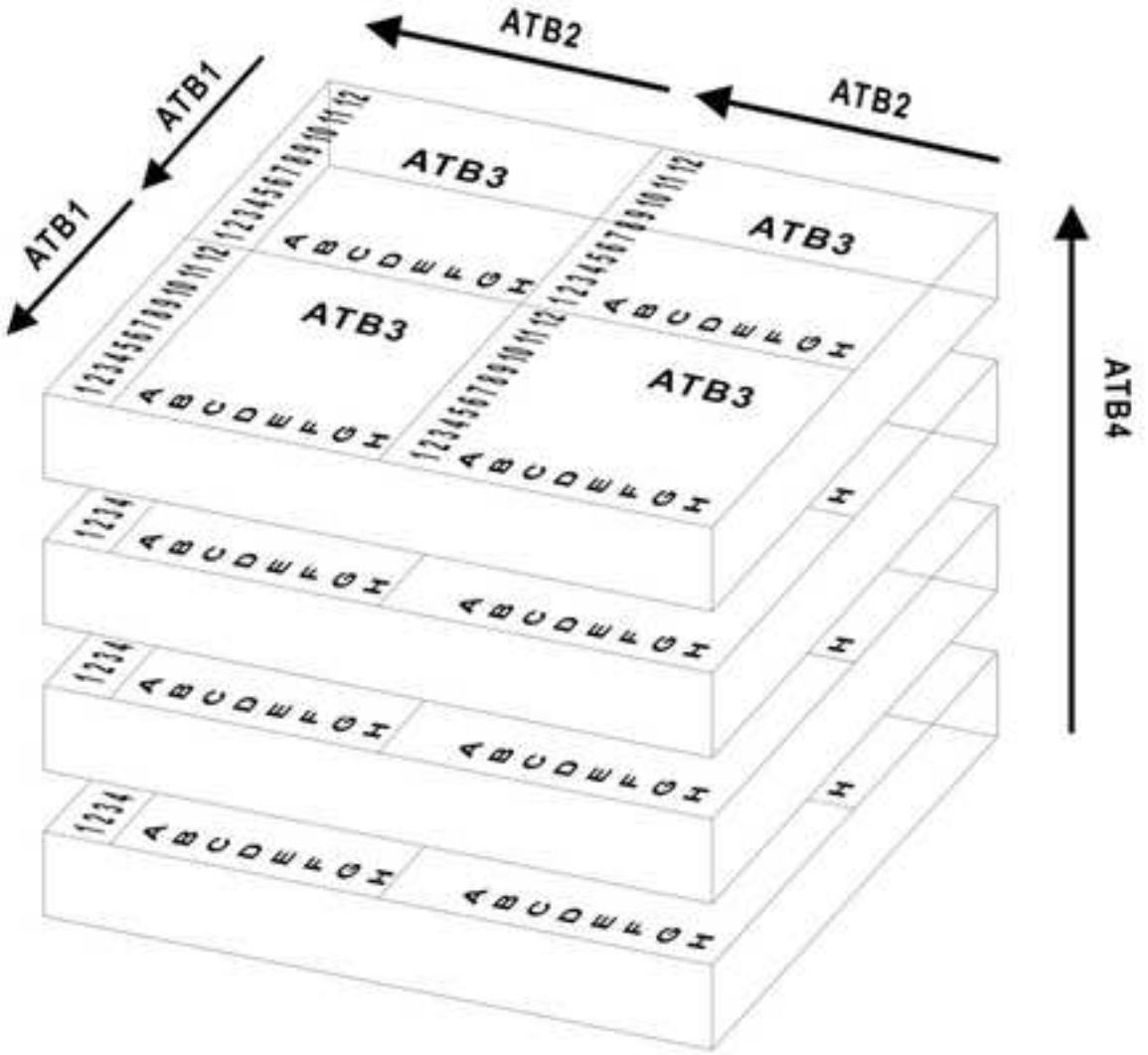
Figure 1

Click here to access/download;Figure;Figure 1.jpg



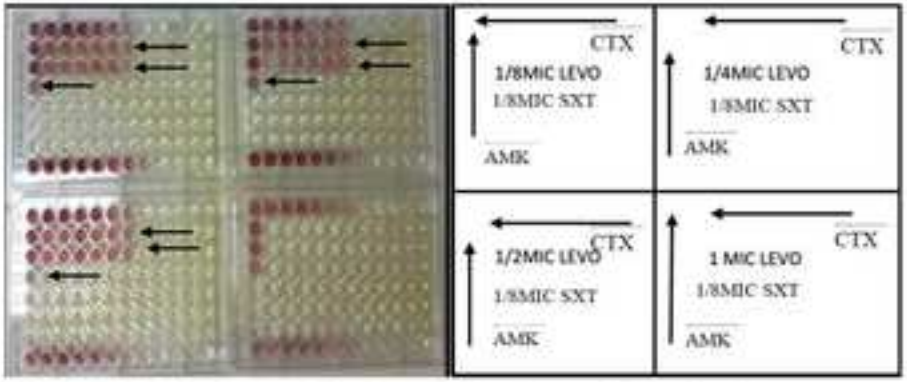


Fig 2-A: Q-Checkerboard results between Cefotaxime, Amikacin, Levofloxacin, and 1/8MIC Trimethoprim-sulfamethoxazole

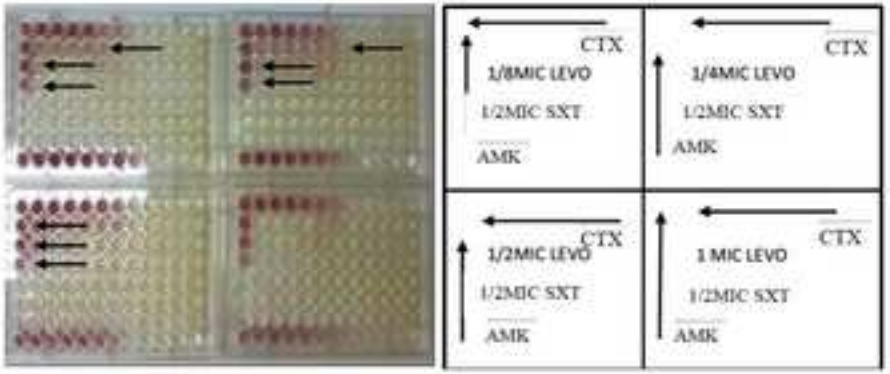


Fig 2-C: Q-Checkerboard results between Cefotaxime, Amikacin, Levofloxacin, and 1/2MIC Trimethoprim-sulfamethoxazole

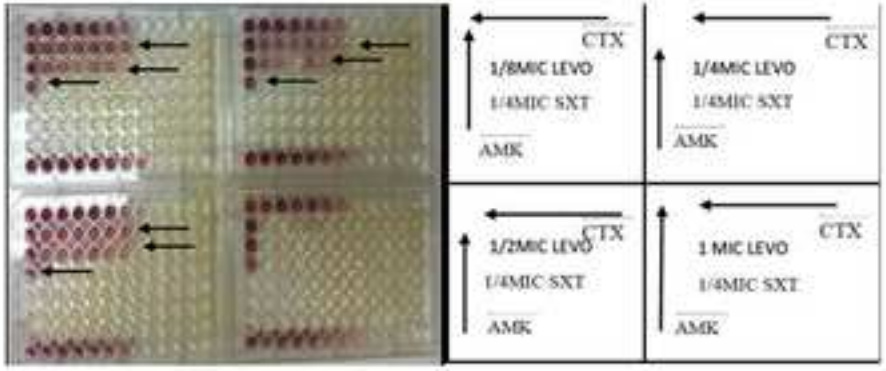


Fig 2-B: Q-Checkerboard results between Cefotaxime, Amikacin, Levofloxacin, and 1/4MIC Trimethoprim-sulfamethoxazole

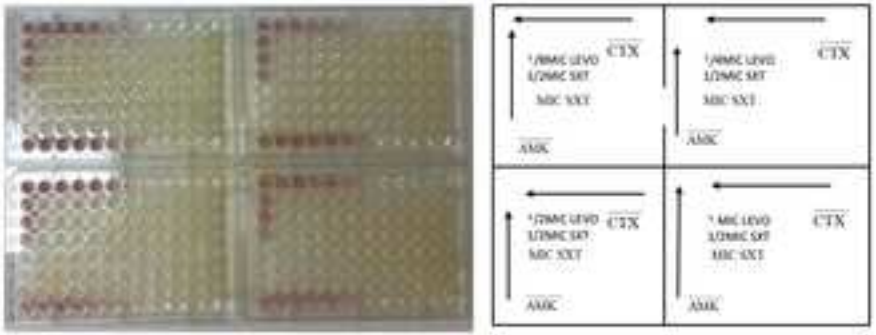


Fig 2-D: Q-Checkerboard results between Cefotaxime, Amikacin, Levofloxacin, and MIC Trimethoprim-sulfamethoxazole

Editorial comments:

Changes to be made by the Author(s):
1. Please combine all panels of Figure 1 into one image file. Alternatively, each panel can be its own figure.
2. Figure 1 should be the schematic and Figure 2 should be the results. Please renumber the figures accordingly.

Changes to be made by the Author(s) regarding the video:
1. Video & Audio Editing:
• 4:218-4:21 - What happens to the audio here. The narration is cut off mid-sentence.
• 06:14-06:39 Consider cutting out this part. Verbally stating the calculations in the narration is not necessary, nor is it going to be retained by the audience. The best way to convey this information is to hold (freeze frame) on the text shot of the calculations. The audience will likely not remember the figures from the narration but rather the on-screen text @06:09.
• 07:39-08:19 Consider cutting out this part. Verbally stating the calculations in the narration is not necessary, nor is it going to be retained by the audience. The best way to convey this information is to hold (freeze frame) on the text shot of the calculations. The audience will likely not remember the figures from the narration but rather the on-screen text @07:36
• 10:03-11:59 The narration is only in the left audio channel, it should be balanced onto both audio channels (speakers.)
• 11:51-11:59 Consider scaling this graphic down slightly and making the resulting background white to fill. The text is very close to the edges of the frame, making it difficult to read.

2. Please identify all on screen speakers (0:05)
3. On-Screen Text:
3:03/4:12/6:06/6:10/7:32 - Please subscript the 1's and 2' here. Similarly with the 3's and 4's throughout the video
3:06 - Please superscript the 5 in 10^5 and remove the "^". Similarly at 4:19 with 10^3. 9:21, etc.

FIC excel template includes different sheets where each sheet represents an experiment done.

FIC all sheet in the excel file: It represents a table containing 3 experiments: the normal checkerboard between 2 drugs (Cefotaxime and Amikacin), the three dimensional checkerboard between 3 drugs (Cefotaxime, Amikacin and Levofloxacin), and the Q-checkerboard between 4 drugs (Cefotaxime, Amikacin, Levofloxacin and Trimethoprim-sulfamethoxazole). The Sub-MIC concentrations of the used drugs are also written to show for each experiment what are the concentrations of the used drugs.

The final FIC that should be interpreted with the interpretation either synergistic, antagonistic or indifferent where S represents synergism. A quantification value which is equal to the final FIC minus 1 and according to this value the scale is shown. In our results, the FIC value is below than 1 meaning “S” or synergism, the quantification value is negative meaning that the scale should show a plus sign which is interpreted as slightly synergistic.

For each experiment (2D = Checkerboard, 3D = three-dimensional checkerboard, and 4D = Q-checkerboard), a final FIC is calculated and interpreted according to the criteria mentioned.

2D sheet represents the normal checkerboard done between 2 drugs (Cefotaxime and Amikacin).

3D1 sheet represents the first plate of the three-dimensional checkerboard done between 3 drugs: Cefotaxime, Amikacin and 1/8MIC Levofloxacin.

3D2 sheet represents the first plate of the three-dimensional checkerboard done between 3 drugs: Cefotaxime, Amikacin and 1/4MIC Levofloxacin.

3D3 sheet represents the first plate of the three-dimensional checkerboard done between 3 drugs: Cefotaxime, Amikacin and 1/2MIC Levofloxacin.

QD1 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/8MIC Levofloxacin and 1/8MIC Trimethoprim-sulfamethoxazole.

QD2 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/8MIC Levofloxacin and 1/4MIC Trimethoprim-sulfamethoxazole.

QD3 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/8MIC Levofloxacin and 1/2MIC Trimethoprim-sulfamethoxazole.

QD4 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/4MIC Levofloxacin and 1/8MIC Trimethoprim-sulfamethoxazole.

QD5 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/4MIC Levofloxacin and 1/4MIC Trimethoprim-sulfamethoxazole.

QD6 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/4MIC Levofloxacin and 1/2MIC Trimethoprim-sulfamethoxazole.

QD7 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/2MIC Levofloxacin and 1/8MIC Trimethoprim-sulfamethoxazole.

QD8 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/2MIC Levofloxacin and 1/4MIC Trimethoprim-sulfamethoxazole.

QD9 sheet represents the plate of the Q-checkerboard containing the 4 drugs: Cefotaxime, Amikacin, 1/2MIC Levofloxacin and 1/2MIC Trimethoprim-sulfamethoxazole.

	Combination effect of ATB1, ATB2, ATB3, ATB4			Sub-MICs tested
ATB1- Cefotaxime	+	+	+	All concentrations
ATB2- Amikacin	+	+	+	All concentrations
ATB3- Levofloxacin	-	+	+	1/8-1/4-1/2
ATB4- Trimeth-Sulfa	-	-	+	1/8-1/4-1/2
Checkerboard	2D	3D	4D	
Mean of Sum all FICs	#DIV/0!	#DIV/0!	#DIV/0!	
Interpretation	#DIV/0!	#DIV/0!	#DIV/0!	
Qantification	#DIV/0!	#DIV/0!	#DIV/0!	
Scale	#DIV/0!	#DIV/0!	#DIV/0!	

Combination between ATE

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

ɜ 1 and ATB 2

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB 1
FIC1, FIC1
FIC2, FIC2
FIC3, FIC3
FIC4, FIC4
FIC5, FIC5
FIC6, FIC6
FIC7, FIC7
FIC8, FIC8
FIC9, FIC9
FIC10, FIC10
FIC10, FIC11
FIC10, FIC12
FIC10, FIC13
FIC10, FIC14
FIC10, FIC15
FIC10, FIC16
FIC10, FIC17

L+2
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!
#DIV/0!

Combination between ATB1, ATB2 and 1/8 A

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

ATB3

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB 1+2+3	
FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2 and 1/4 MI

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

C ATB3

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB 1+2+3	
FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2 and 1/2MI

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3

6- Adjust the selection of the average cells

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

C ATB3

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB 1+2+3	
FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/8MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/8ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/8MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/4ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/8MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/2ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/4MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/8ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/4MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/4ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/4MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/2ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/2MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/8ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/2MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/4ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

Combination between ATB1, ATB2, 1/2MIC ATB3 a

	1	2	3	4	5	6	7	8	9
A	PC	0	0	0	0	0	0	0	0
B		0	0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC	0	0	0	0	0	0	0	0

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0
C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B			0	0	0	0	0	0	0

C		0	0	0	0	0	0	0	0
D		0	0	0	0	0	0	0	0
E		0	0	0	0	0	0	0	0
F		0	0	0	0	0	0	0	0
G		0	0	0	0	0	0	0	0
H	PC								

PANEL D

nd 1/2ATB4

10	11	12
0	0	
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**NC**

ΣFIC	#DIV/0!

ATB1	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB2	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

10	11	12
0	0	0

ATB3	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

ATB4	
MIC=	
FIC1	#DIV/0!
FIC2	#DIV/0!
FIC3	#DIV/0!
FIC4	#DIV/0!
FIC5	#DIV/0!
FIC6	#DIV/0!
FIC7	#DIV/0!
FIC8	#DIV/0!
FIC9	#DIV/0!
FIC10	#DIV/0!
FIC11	#DIV/0!
FIC12	#DIV/0!
FIC13	#DIV/0!
FIC14	#DIV/0!
FIC15	#DIV/0!
FIC16	#DIV/0!
FIC17	#DIV/0!

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	#DIV/0!
FIC2, FIC2, FIC2, FIC2	#DIV/0!
FIC3, FIC3, FIC3, FIC3	#DIV/0!
FIC4, FIC4, FIC4, FIC4	#DIV/0!
FIC5, FIC5, FIC5, FIC5	#DIV/0!
FIC6, FIC6, FIC6, FIC6	#DIV/0!
FIC7, FIC7, FIC7, FIC7	#DIV/0!
FIC8, FIC8, FIC8, FIC8	#DIV/0!
FIC9, FIC9, FIC9, FIC9	#DIV/0!
FIC10, FIC10, FIC10, FIC10	#DIV/0!
FIC10, FIC11, FIC11, FIC11	#DIV/0!
FIC10, FIC12, FIC12, FIC12	#DIV/0!
FIC10, FIC13, FIC13, FIC13	#DIV/0!
FIC10, FIC14, FIC14, FIC14	#DIV/0!
FIC10, FIC15, FIC15, FIC15	#DIV/0!
FIC10, FIC16, FIC16, FIC16	#DIV/0!
FIC10, FIC17, FIC17, FIC17	#DIV/0!

	Combination effect of ATB1, ATB2, ATB3, ATB4			Sub-MICs tested
ATB1- Cefotaxime	+	+	+	All concentrations
ATB2- Amikacin	+	+	+	All concentrations
ATB3- Levofloxacin	-	+	+	1/8-1/4-1/2
ATB4- Trimeth-Sulfa	-	-	+	1/8-1/4-1/2
Checkerboard	2D	3D	4D	
Mean of Sum all FICs	0.8125	0.9340	0.9952	
Interpretation	S	S	S	
Quantification	-0.1875	-0.0660	-0.0048	
Scale	+	+	+	

Combination between Cefotax

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

ime and Amikacin

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.8125

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB1	
MIC=	32
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB 1
FIC1, FIC1
FIC2, FIC2
FIC3, FIC3
FIC4, FIC4
FIC5, FIC5
FIC6, FIC6
FIC7, FIC7
FIC8, FIC8
FIC9, FIC9
FIC10, FIC10
FIC10, FIC11
FIC10, FIC12
FIC10, FIC13
FIC10, FIC14
FIC10, FIC15
FIC10, FIC16
FIC10, FIC17

1+2
0.1875
0.25
0.375
0
0
0
0
0
0
0
0
0
0
0
0
0
0

Combination between Cefotaxime, Amikacin and 1/8

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		2	2	2	2	2	2	2	2
C		2	2	2	2	2	2	2	2
D		2	2	2	2	2	2	2	2
E		2	2	2	2	2	2	2	2
F		2	2	2	2	2	2	2	2
G		2	2	2	2	2	2	2	2
H	PC								

PANEL C

3 Levofloxacin

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.791667

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

10	11	12
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
		NC

ATB1	
MIC=	32
FIC1	0.5
FIC2	0.5
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB3	
MIC=	16
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB 1+2+3	
FIC1, FIC1, FIC1	0.25
FIC2, FIC2, FIC2	0.291667
FIC3, FIC3, FIC3	0.25
FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11	0
FIC10, FIC12, FIC12	0
FIC10, FIC13, FIC13	0
FIC10, FIC14, FIC14	0
FIC10, FIC15, FIC15	0
FIC10, FIC16, FIC16	0
FIC10, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin and 1/4 M

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		4	4	4	4	4	4	4	4
C		4	4	4	4	4	4	4	4
D		4	4	4	4	4	4	4	4
E		4	4	4	4	4	4	4	4
F		4	4	4	4	4	4	4	4
G		4	4	4	4	4	4	4	4
H	PC								

PANEL C

MIC Levofloxacin

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.880208

ATB1	
MIC=	32
FIC1	0.5
FIC2	0.5
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

10	11	12
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
		NC

ATB3	
MIC=	16
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB 1+2+3	
FIC1, FIC1, FIC1	0.291667
FIC2, FIC2, FIC2	0.333333
FIC3, FIC3, FIC3	0.255208
FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11	0
FIC10, FIC12, FIC12	0
FIC10, FIC13, FIC13	0
FIC10, FIC14, FIC14	0
FIC10, FIC15, FIC15	0
FIC10, FIC16, FIC16	0
FIC10, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin and 1/2M

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		8	8	8	8	8	8	8	8
C		8	8	8	8	8	8	8	8
D		8	8	8	8	8	8	8	8
E		8	8	8	8	8	8	8	8
F		8	8	8	8	8	8	8	8
G		8	8	8	8	8	8	8	8
H	PC								

PANEL C

MIC Levofloxacin

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	1.130208

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

10	11	12
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
		NC

ATB1	
MIC=	32
FIC1	0.5
FIC2	0.5
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB3	
MIC=	16
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB 1+2+3	
FIC1, FIC1, FIC1	0.375
FIC2, FIC2, FIC2	0.416667
FIC3, FIC3, FIC3	0.338542
FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11	0
FIC10, FIC12, FIC12	0
FIC10, FIC13, FIC13	0
FIC10, FIC14, FIC14	0
FIC10, FIC15, FIC15	0
FIC10, FIC16, FIC16	0
FIC10, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/8MIC levofloxac

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		2	2	2	2	2	2	2	2
C		2	2	2	2	2	2	2	2
D		2	2	2	2	2	2	2	2
E		2	2	2	2	2	2	2	2
F		2	2	2	2	2	2	2	2
G		2	2	2	2	2	2	2	2
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		512	512	512	512	512	512	512	512

C		512	512	512	512	512	512	512	512
D		512	512	512	512	512	512	512	512
E		512	512	512	512	512	512	512	512
F		512	512	512	512	512	512	512	512
G		512	512	512	512	512	512	512	512
H	PC								

PANEL D

cin and 1/8 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.910156

ATB1	
MIC=	32
FIC1	1
FIC2	1
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
		NC

10	11	12
512	512	512

512	512	512
512	512	512
512	512	512
512	512	512
512	512	512
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.34375
FIC2, FIC2, FIC2, FIC2	0.375
FIC3, FIC3, FIC3, FIC3	0.191406
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/8MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		2	2	2	2	2	2	2	2
C		2	2	2	2	2	2	2	2
D		2	2	2	2	2	2	2	2
E		2	2	2	2	2	2	2	2
F		2	2	2	2	2	2	2	2
G		2	2	2	2	2	2	2	2
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		1024	1024	1024	1024	1024	1024	1024	1024

C		1024	1024	1024	1024	1024	1024	1024	1024
D		1024	1024	1024	1024	1024	1024	1024	1024
E		1024	1024	1024	1024	1024	1024	1024	1024
F		1024	1024	1024	1024	1024	1024	1024	1024
G		1024	1024	1024	1024	1024	1024	1024	1024
H	PC								

PANEL D

cin and 1/4 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.878906

ATB1	
MIC=	32
FIC1	0.5
FIC2	0.015625
FIC3	1
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.25
FIC2	0.5
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
		NC

10	11	12
1024	1024	1024

1024	1024	1024
1024	1024	1024
1024	1024	1024
1024	1024	1024
1024	1024	1024
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.28125
FIC2, FIC2, FIC2, FIC2	0.222656
FIC3, FIC3, FIC3, FIC3	0.375
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/8MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		2	2	2	2	2	2	2	2
C		2	2	2	2	2	2	2	2
D		2	2	2	2	2	2	2	2
E		2	2	2	2	2	2	2	2
F		2	2	2	2	2	2	2	2
G		2	2	2	2	2	2	2	2
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		2048	2048	2048	2048	2048	2048	2048	2048

C		2048	2048	2048	2048	2048	2048	2048	2048
D		2048	2048	2048	2048	2048	2048	2048	2048
E		2048	2048	2048	2048	2048	2048	2048	2048
F		2048	2048	2048	2048	2048	2048	2048	2048
G		2048	2048	2048	2048	2048	2048	2048	2048
H	PC								

PANEL D

cin and 1/2 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.757813

ATB1	
MIC=	32
FIC1	0.015625
FIC2	0.015625
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.25
FIC2	0.5
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
2	2	2
		NC

10	11	12
2048	2048	2048

2048	2048	2048
2048	2048	2048
2048	2048	2048
2048	2048	2048
2048	2048	2048
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.222656
FIC2, FIC2, FIC2, FIC2	0.285156
FIC3, FIC3, FIC3, FIC3	0.25
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/4MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		4	4	4	4	4	4	4	4
C		4	4	4	4	4	4	4	4
D		4	4	4	4	4	4	4	4
E		4	4	4	4	4	4	4	4
F		4	4	4	4	4	4	4	4
G		4	4	4	4	4	4	4	4
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		512	512	512	512	512	512	512	512

C		512	512	512	512	512	512	512	512
D		512	512	512	512	512	512	512	512
E		512	512	512	512	512	512	512	512
F		512	512	512	512	512	512	512	512
G		512	512	512	512	512	512	512	512
H	PC								

PANEL D

cin and 1/8 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	1.003906

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

10	11	12
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
		NC

10	11	12
512	512	512

ATB1	
MIC=	32
FIC1	1
FIC2	1
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB3	
MIC=	16
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

512	512	512
512	512	512
512	512	512
512	512	512
512	512	512
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.375
FIC2, FIC2, FIC2, FIC2	0.40625
FIC3, FIC3, FIC3, FIC3	0.222656
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/4MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		4	4	4	4	4	4	4	4
C		4	4	4	4	4	4	4	4
D		4	4	4	4	4	4	4	4
E		4	4	4	4	4	4	4	4
F		4	4	4	4	4	4	4	4
G		4	4	4	4	4	4	4	4
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		1024	1024	1024	1024	1024	1024	1024	1024

C		1024	1024	1024	1024	1024	1024	1024	1024
D		1024	1024	1024	1024	1024	1024	1024	1024
E		1024	1024	1024	1024	1024	1024	1024	1024
F		1024	1024	1024	1024	1024	1024	1024	1024
G		1024	1024	1024	1024	1024	1024	1024	1024
H	PC								

PANEL D

cin and 1/4 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.910156

ATB1	
MIC=	32
FIC1	1
FIC2	0.25
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
		NC

10	11	12
1024	1024	1024

1024	1024	1024
1024	1024	1024
1024	1024	1024
1024	1024	1024
1024	1024	1024
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.40625
FIC2, FIC2, FIC2, FIC2	0.25
FIC3, FIC3, FIC3, FIC3	0.253906
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/4MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		4	4	4	4	4	4	4	4
C		4	4	4	4	4	4	4	4
D		4	4	4	4	4	4	4	4
E		4	4	4	4	4	4	4	4
F		4	4	4	4	4	4	4	4
G		4	4	4	4	4	4	4	4
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		2048	2048	2048	2048	2048	2048	2048	2048

C		2048	2048	2048	2048	2048	2048	2048	2048
D		2048	2048	2048	2048	2048	2048	2048	2048
E		2048	2048	2048	2048	2048	2048	2048	2048
F		2048	2048	2048	2048	2048	2048	2048	2048
G		2048	2048	2048	2048	2048	2048	2048	2048
H	PC								

PANEL D

cin and 1/2 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	1.039063

ATB1	
MIC=	32
FIC1	1
FIC2	0.015625
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
		NC

10	11	12
2048	2048	2048

2048	2048	2048
2048	2048	2048
2048	2048	2048
2048	2048	2048
2048	2048	2048
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.46875
FIC2, FIC2, FIC2, FIC2	0.253906
FIC3, FIC3, FIC3, FIC3	0.316406
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/2MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		8	8	8	8	8	8	8	8
C		8	8	8	8	8	8	8	8
D		8	8	8	8	8	8	8	8
E		8	8	8	8	8	8	8	8
F		8	8	8	8	8	8	8	8
G		8	8	8	8	8	8	8	8
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		512	512	512	512	512	512	512	512

C		512	512	512	512	512	512	512	512
D		512	512	512	512	512	512	512	512
E		512	512	512	512	512	512	512	512
F		512	512	512	512	512	512	512	512
G		512	512	512	512	512	512	512	512
H	PC								

PANEL D

cin and 1/8 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	1.191406

ATB1	
MIC=	32
FIC1	1
FIC2	1
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.125
FIC2	0.125
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
		NC

10	11	12
512	512	512

512	512	512
512	512	512
512	512	512
512	512	512
512	512	512
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.4375
FIC2, FIC2, FIC2, FIC2	0.46875
FIC3, FIC3, FIC3, FIC3	0.285156
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/2MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		8	8	8	8	8	8	8	8
C		8	8	8	8	8	8	8	8
D		8	8	8	8	8	8	8	8
E		8	8	8	8	8	8	8	8
F		8	8	8	8	8	8	8	8
G		8	8	8	8	8	8	8	8
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		1024	1024	1024	1024	1024	1024	1024	1024

C		1024	1024	1024	1024	1024	1024	1024	1024
D		1024	1024	1024	1024	1024	1024	1024	1024
E		1024	1024	1024	1024	1024	1024	1024	1024
F		1024	1024	1024	1024	1024	1024	1024	1024
G		1024	1024	1024	1024	1024	1024	1024	1024
H	PC								

PANEL D

cin and 1/4 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	1.285156

ATB1	
MIC=	32
FIC1	1
FIC2	1
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.125
FIC2	0.25
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.25
FIC2	0.25
FIC3	0.25
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
		NC

10	11	12
1024	1024	1024

1024	1024	1024
1024	1024	1024
1024	1024	1024
1024	1024	1024
1024	1024	1024
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.46875
FIC2, FIC2, FIC2, FIC2	0.5
FIC3, FIC3, FIC3, FIC3	0.316406
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

Combination between Cefotaxime, Amikacin, 1/2MIC Levofloxa

	1	2	3	4	5	6	7	8	9
A	PC	0.5	1	2	4	8	16	32	64
B		0.5	1	2	4	8	16	32	64
C		0.5	1	2	4	8	16	32	64
D		0.5	1	2	4	8	16	32	64
E		0.5	1	2	4	8	16	32	64
F		0.5	1	2	4	8	16	32	64
G		0.5	1	2	4	8	16	32	64
H	PC	0.5	1	2	4	8	16	32	64

PANEL A

1- Choose the highest concentration of ATB1 (M2)

2- Choose the highest concentration of ATB2 (B29)

3- Choose MIC of ATB1, ATB2, ATB3, ATB4

4- Trace the Red line (G/NG interface)

5- Select FICs for ATB1, ATB2, ATB3, ATB4

	1	2	3	4	5	6	7	8	9
A	PC								
B	2	2	2	2	2	2	2	2	2
C	4	4	4	4	4	4	4	4	4
D	8	8	8	8	8	8	8	8	8
E	16	16	16	16	16	16	16	16	16
F	32	32	32	32	32	32	32	32	32
G	64	64	64	64	64	64	64	64	64
H	PC								

PANEL B

	1	2	3	4	5	6	7	8	9
A	PC								
B		8	8	8	8	8	8	8	8
C		8	8	8	8	8	8	8	8
D		8	8	8	8	8	8	8	8
E		8	8	8	8	8	8	8	8
F		8	8	8	8	8	8	8	8
G		8	8	8	8	8	8	8	8
H	PC								

PANEL C

	1	2	3	4	5	6	7	8	9
A	PC								
B		2048	2048	2048	2048	2048	2048	2048	2048

C		2048	2048	2048	2048	2048	2048	2048	2048
D		2048	2048	2048	2048	2048	2048	2048	2048
E		2048	2048	2048	2048	2048	2048	2048	2048
F		2048	2048	2048	2048	2048	2048	2048	2048
G		2048	2048	2048	2048	2048	2048	2048	2048
H	PC								

PANEL D

cin and 1/2 Trimeth-Sulfa

10	11	12
128	256	256
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**256**
128	256	**NC**

ΣFIC	0.980469

ATB1	
MIC=	32
FIC1	0.015625
FIC2	0.015625
FIC3	0.015625
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB2	
MIC=	16
FIC1	0.25
FIC2	0.5
FIC3	0.125
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
2	2	2
4	4	4
8	8	8
16	16	16
32	32	32
64	64	64
		NC

ATB3	
MIC=	16
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

ATB4	
MIC=	4096
FIC1	0.5
FIC2	0.5
FIC3	0.5
FIC4	0
FIC5	0
FIC6	0
FIC7	0
FIC8	0
FIC9	0
FIC10	0
FIC11	0
FIC12	0
FIC13	0
FIC14	0
FIC15	0
FIC16	0
FIC17	0

10	11	12
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
8	8	8
		NC

10	11	12
2048	2048	2048

2048	2048	2048
2048	2048	2048
2048	2048	2048
2048	2048	2048
2048	2048	2048
		NC

ATB 1+2+3+4	
FIC1, FIC1, FIC1, FIC1	0.316406
FIC2, FIC2, FIC2, FIC2	0.378906
FIC3, FIC3, FIC3, FIC3	0.285156
FIC4, FIC4, FIC4, FIC4	0
FIC5, FIC5, FIC5, FIC5	0
FIC6, FIC6, FIC6, FIC6	0
FIC7, FIC7, FIC7, FIC7	0
FIC8, FIC8, FIC8, FIC8	0
FIC9, FIC9, FIC9, FIC9	0
FIC10, FIC10, FIC10, FIC10	0
FIC10, FIC11, FIC11, FIC11	0
FIC10, FIC12, FIC12, FIC12	0
FIC10, FIC13, FIC13, FIC13	0
FIC10, FIC14, FIC14, FIC14	0
FIC10, FIC15, FIC15, FIC15	0
FIC10, FIC16, FIC16, FIC16	0
FIC10, FIC17, FIC17, FIC17	0

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