|         | WT       | Δrnf1   | Δfix    |
|---------|----------|---------|---------|
| **Generation Time (hrs)** |          |         |         |
| 19.4% O<sub>2</sub> (atm) | 3.1 ± 0.0 | 3.0 ± 0.1 | 4.0 ± 0.0 |
| 10% O<sub>2</sub>        | 4.9 ± 0.1 | 4.5 ± 0.1 | 8.7 ± 0.2 |

**Supplementary Table 1.** Generation times of WT Δrnf1 and Δfix strains grown in nitrogen-fixing conditions in a six-well plate. Plates were shaken at 300 RPM in a double orbital rotation and atmosphere was controlled with added nitrogen. (Replicates n =3)
Supplementary Figure 1. Growth rates on 1 mM of metronidazole. WT, Δrnf1 and Δfix strains were all grown in a 200 mL of nitrogen free burks media in a 500 mL baffled flask at 200 RPM. Wt and the Δfix strains grow slowly and both do not reach normal terminal ODs. The Δrnf1 strain also grows slower than in no metronidazole but is able to reach a higher terminal OD. (Replicates n =3)
In [4]: To convert to mV we will use

We can simply plot the relationship between the

Now we can take this information and show how Rnf would be influenced by the proton motive force and how this could make it a

following equations:

So we can see that while the

does effect the mid point potential only in the extremes is it going to cause some reactions to be

As we can see to calculate the above equation we use the following equation for any ratio

G

We can see that in order to find the above equation we use the value below for any ratio

G

Solving for

We can see now that the above equation is in content because an increase in potential for the proton motive force results in an increase of the mid point potential for the reaction.

When the independent variable is not zero we will not be able to calculate

Giving

The proton motive force for the above reaction is calculated by calculating the reaction and the is the proton motive force for the reaction.

For the above reaction we can calculate

When we change the potential for the above reaction we have now calculated the reaction and the for the 2 the are proportionate to the reaction.

The reaction is

For any we can use an estimate of the reaction.

Ref stoichiometry is dependent on chemical potential well as substrate and product mid potential.

Ref and not have determined whether or not the reaction is reversible. The overall stoichiometry is calculated through the reaction.

To determine the potential

Where

We can use equation 1 to calculate the output of the reaction.

When we calculate the above equation we use the value below for any ratio

G

For the above equation we can calculate

When we change the potential for the above reaction we have now calculated the reaction and the for the 2 the are proportionate to the reaction.

To output below we use

When we calculate the above equation we use the value below for any ratio

G

For the above equation we can calculate

When we change the potential for the above reaction we have now calculated the reaction and the for the 2 the are proportionate to the reaction.
