

# Glycolysis in *E. anophelis*

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## ABSTRACT

Our objective was to select a pathway of genes and record the purposes of a select few and also to observe how the transcription of these genes were affected by various antibiotics.

## INTRODUCTION

*Elizabethkingia anophelis* is a gram negative, non-spore forming bacteria that is resistant to a number of antibiotics. It recently came into the spotlight when an outbreak in Wisconsin spread to two other states and infected 61 known subjects, killing 18. (5, 6)

Glycolysis is the process by which enzymes produce energy and pyruvic acid by breaking down glucose. Five genes that code for enzymes that contribute to this process in *Elizabethkingia anophelis* are Fructose-bisphosphate aldolase class II, Glucokinase, Triosephosphate isomerase, Alcohol dehydrogenase, and Enolase. (4, 5)

## MATERIALS AND METHODS

We used a number of online databases provided by Dr. Canaan to find and research our selected genes:

- RAST database
- Patric database
- BLAST site

Physical materials were rather basic. We used the contents of our backpacks:

- Laptop
- Pencil/Pen
- Notebook

## REFERENCES

1. <http://rast.nmpdr.org/rast.cgi?page=Jobs>
2. [https://www.patricbrc.org/portal/portal/patric/CompPathwayTable?cType=genome&cId=1246994.3&algorithm=PATRIC&ec\\_number](https://www.patricbrc.org/portal/portal/patric/CompPathwayTable?cType=genome&cId=1246994.3&algorithm=PATRIC&ec_number)
3. <http://darwin.biochem.okstate.edu/blast/blast1990.html>
4. <https://www.wikipedia.org/>
5. <https://www.cdc.gov/>
6. Lecture (Dr. Canaan)

## RESULTS

**Fructose-bisphosphate aldolase class II** is an enzyme that catalyzes a reaction utilized in glycolysis. (4, 5)

PATRIC ID: fig|1246994.3.peg.1403 RefSeq: D505\_07078 Alt Locus Tag: VBIElAno271836\_1403

**Glucokinase** is an enzyme that acts as a facilitator to the process of glycolysis, sensing glucose and triggering the initial reaction. (4, 5)

PATRIC ID: fig|1246994.3.peg.1977 RefSeq: D505\_09878 Alt Locus Tag: VBIElAno271836\_1977

**Triosephosphate isomerase** is an essential enzyme for efficient energy production and is a key part of glycolysis. (4,5)

PATRIC ID: fig|1246994.3.peg.1001 RefSeq: D505\_05084 Alt Locus Tag: VBIElAno271836\_1001

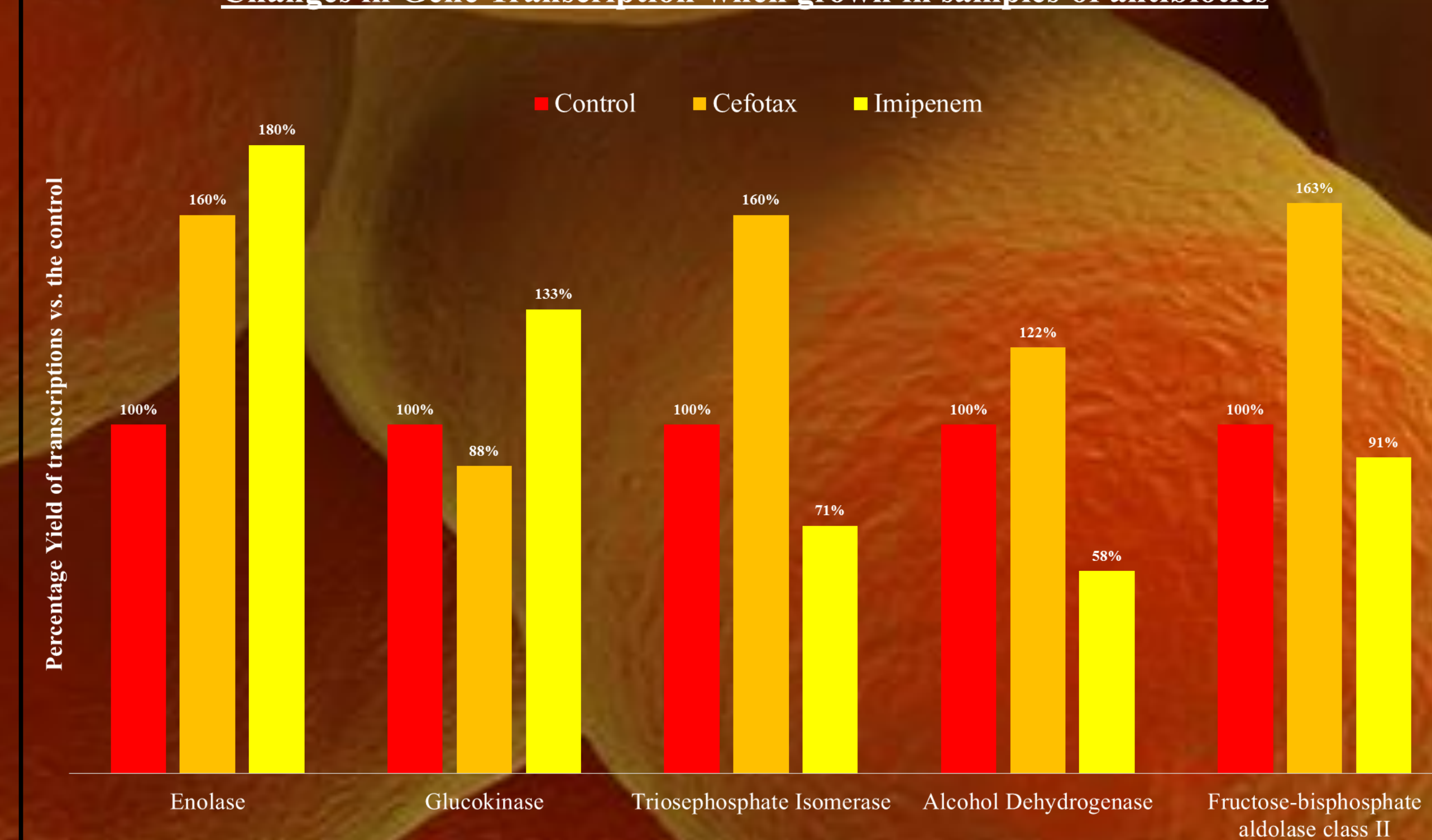
**Alcohol dehydrogenase** is a group of dehydrogenase enzymes that facilitate the interconversion between alcohols and aldehydes or ketones. (4, 5)

PATRIC ID: fig|1246994.3.peg.1704 RefSeq: D505\_08575 Alt Locus Tag: VBIElAno271836\_1704

**Enolase** is a metalloenzyme that catalyzes the second to last reaction involved in glycolysis. (4, 5)

PATRIC ID: fig|1246994.3.peg.2320 RefSeq: D505\_11576 Alt Locus Tag: VBIElAno271836\_2320

Changes in Gene Transcription when grown in samples of antibiotics



## DISCUSSION

Overall, the majority of the genes produced increased transcriptions in the Cefotax sample. The Imipenem had varying effects on the genes that in some cases were nearly unnoticeable.

It seems that exposure to Cefotax caused an increase in the need for glycolysis for the sample of *E. anophelis*. Research of the transcriptions of the other genes involved in glycolysis could further the validity of this hypothesis.

## Glycolysis

