Effects of FUdR on gene expression in the C. elegans bacterial diet OP50

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Research note

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Abstract

Objective: Many C. elegans aging studies use the compound, 5-fluro-2’-deoxyuridine (FUdR), to produce a synchronous population of worms in aging studies. However, it is not fully clear what effects FUdR have on the bacterial gene expression in the E. coli strain OP50, the primary laboratory C. elegans food source. This is particularly relevant as studies indicate that intestinal microbes can affect C. elegans physiology. Here, we examine how exposure to FUdR can affect gene expression changes in OP50 E. coli.

Results: RNAseq datasets were used to compare the expression patterns of E. coli genes in the strain OP50 seeded on either nematode growth media (NGM) plates or on FUdR (50μM) supplemented NGM plates. Analysis showed differential expression of genes involved in general transport, amino acid biosynthesis, transcription, iron transport, and antibiotic resistance. We specifically highlight metabolic enzymes in the L-histidine biosynthesis pathway may be regulated by FUdR exposed OP50. We conclude that OP50 exposed to FUdR results in many differentially expressed genes, including those in amino acid biosynthetic pathways.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures

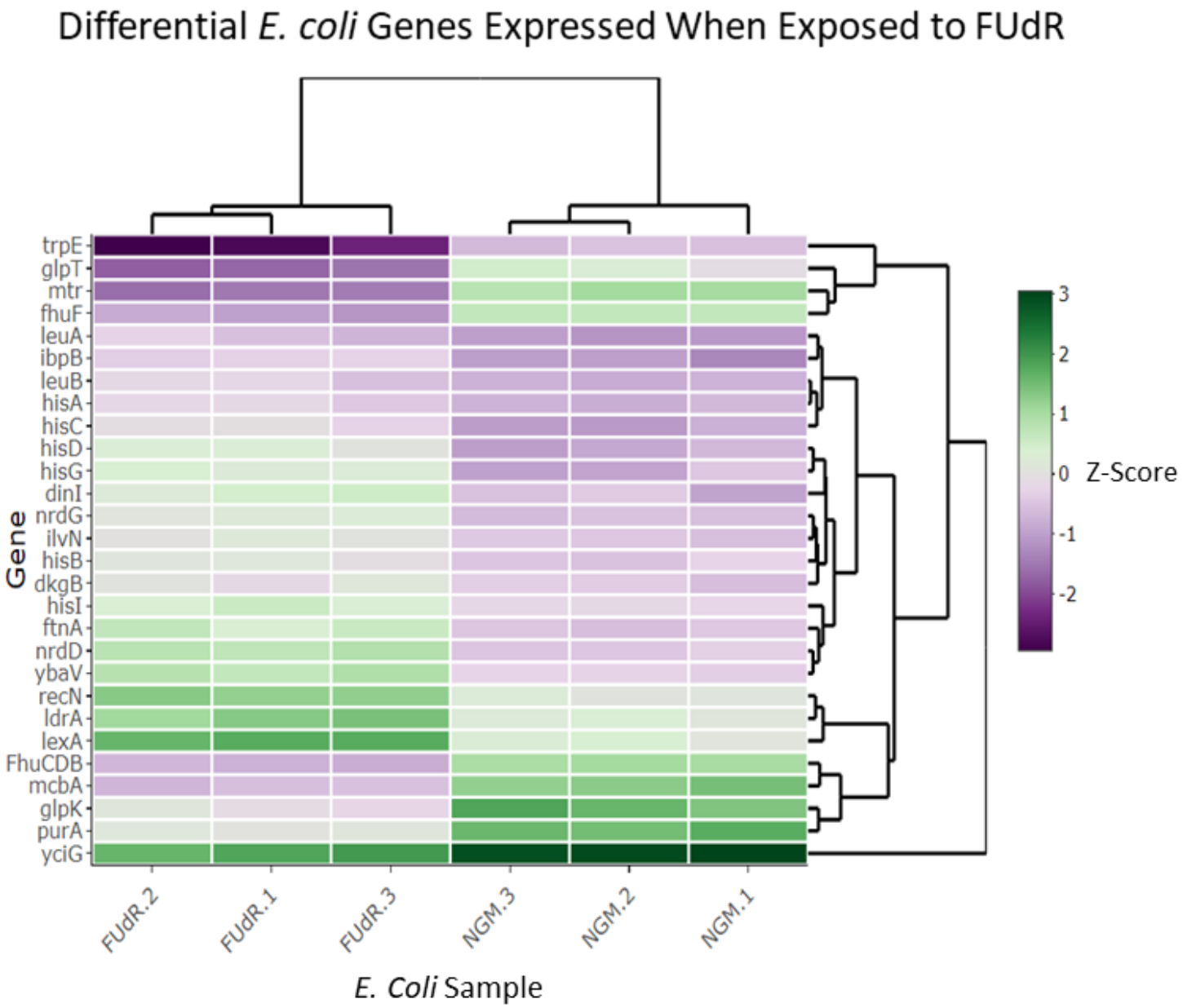

Figure 1

Differentially expressed OP50 E. coli genes in response to FUdR. Heatmap demonstrating the top 28 differentially expressed genes in E. coli (in triplicate) grown on either NGM only (NGM.1-3) or NGM plates supplemented with 50μM FUdR (FUdR.1-3).

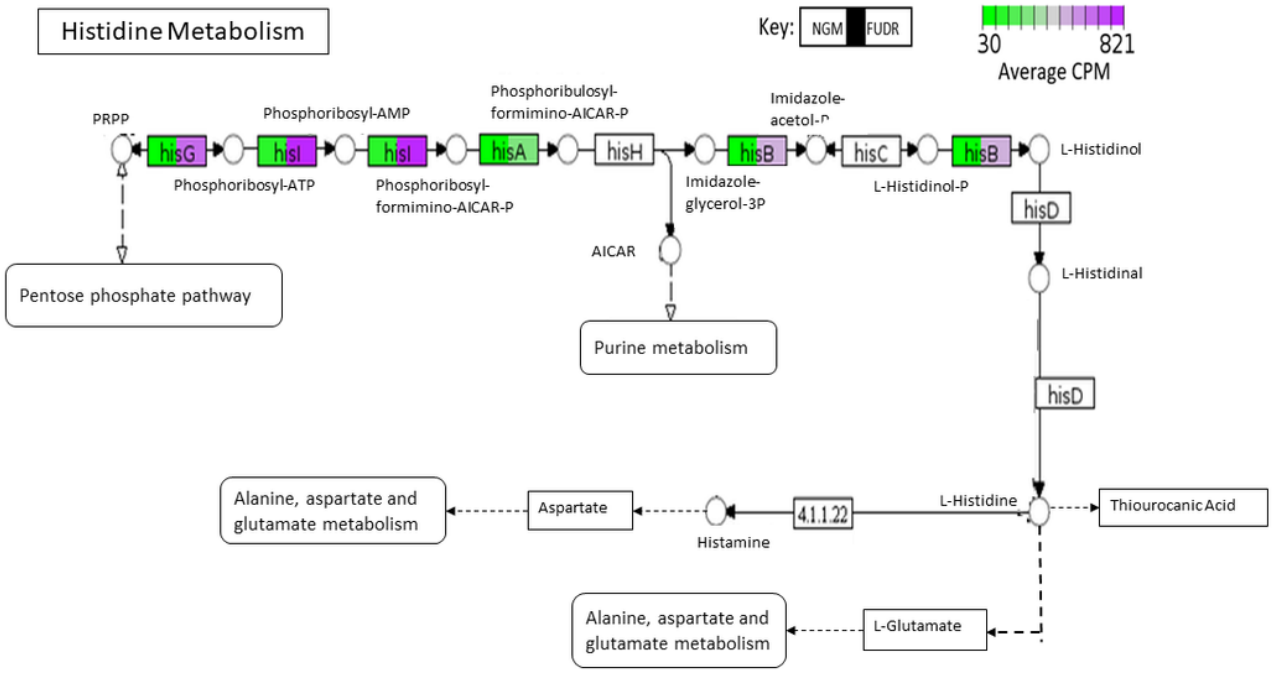

Figure 2

Gene expression differences in the bacterial L-histidine biosynthetic pathway. Pathview plots show differences in the average expression counts of functional enzymes in the L-histidine metabolism pathway between E. coli grown on NGM or NGM+FUdR plates. The color in the rectangles indicates the average CPM expression of E. coli on NGM only (left) compared to E. coli exposed to FUdR (right). We observed that several enzymes in the L-histidine biosynthesis pathway are upregulated in OP50 E. coli when exposed FUdR.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- McIntyreSupplementalTable.csv