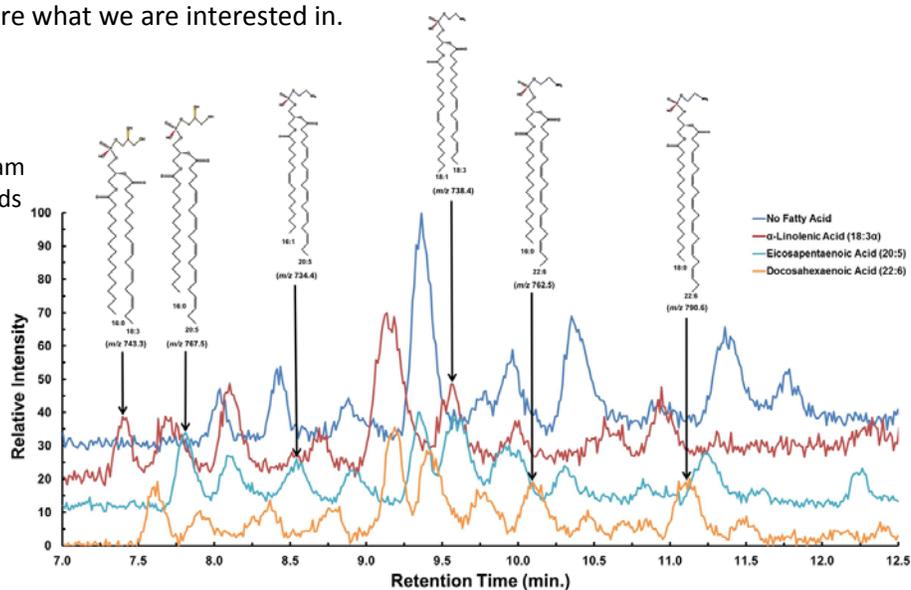


## Mass Spectrometric Quantitation and Structural Characterization of Bacterial Phospholipids Following Fatty Acid Exposure

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Bacteria employ many strategies for survival in their environmental and host reservoirs. Among these, the acquisition and utilization of fatty acids is of recent interest. For many years it was assumed that exogenous fatty acids were simply used as a source of energy, whereas recent research has established their roles as transcription factors and signaling molecules [1-3]. This project, however, focuses on recent observations showing that many bacteria are capable of importing and assimilating fatty acids into their membrane phospholipids [4]. In this collaborative study, bacteria will be grown, in Dr. Giles' laboratory, in both the presence and absence of exogenously supplied fatty acids. Following growth, the lipids will be extracted and purified and presented to this lab for analysis. We will use a Waters UPLC (ultra-performance liquid chromatography) instrument interfaced to an electrospray ionization tandem mass spectrometer (LC-MS) for the *separation, quantitation, and structural characterization* of the phospholipids. By first analyzing bacteria grown without fatty acids (the control group), we will be able to map changes to the overall lipid profile as a result of fatty acid exposure during the growth phase. An example of preliminary data is shown in Fig 1, where it can be seen that the control sample (top chromatogram) is quite different compared to fatty acid exposed samples (next 3 chromatograms). The details of these differences are what we are interested in.

**Figure 1.** UPLC-MS chromatogram comparing isolated phospholipids from *Acinetobacter baumannii* grown in the presence and absence of fatty acids. Significant differences are apparent between fatty acid supplemented cultures versus the control (no fatty acid)



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