

# The Great ESKAPE: Reisolating Natural Products From Fungal Extracts

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## Introduction

- ESKAPE pathogens are a group of drug-resistant infection causing agents common in hospital settings, responsible for causing treatment resistant pneumonia, sepsis, and bloodstream infections.<sup>1</sup>
- Natural products (NPs) are secondary metabolites produced by fungus during normal life functions that are not necessary for survival.<sup>2</sup>
- When submitted to Antimicrobial Bioassay (AMBA), samples of an epiphytic fungi (*unnamed*) collected from mangrove forests in Tampa, FL, had hits for ESKAPE and Naegleria (amoeba) pathogens.
- NPs from this fungi may potentially be used for the treatment of these pathogens, especially in antibiotic resistant cases<sup>3</sup>.

## Methods

Figure 1. Research workflow

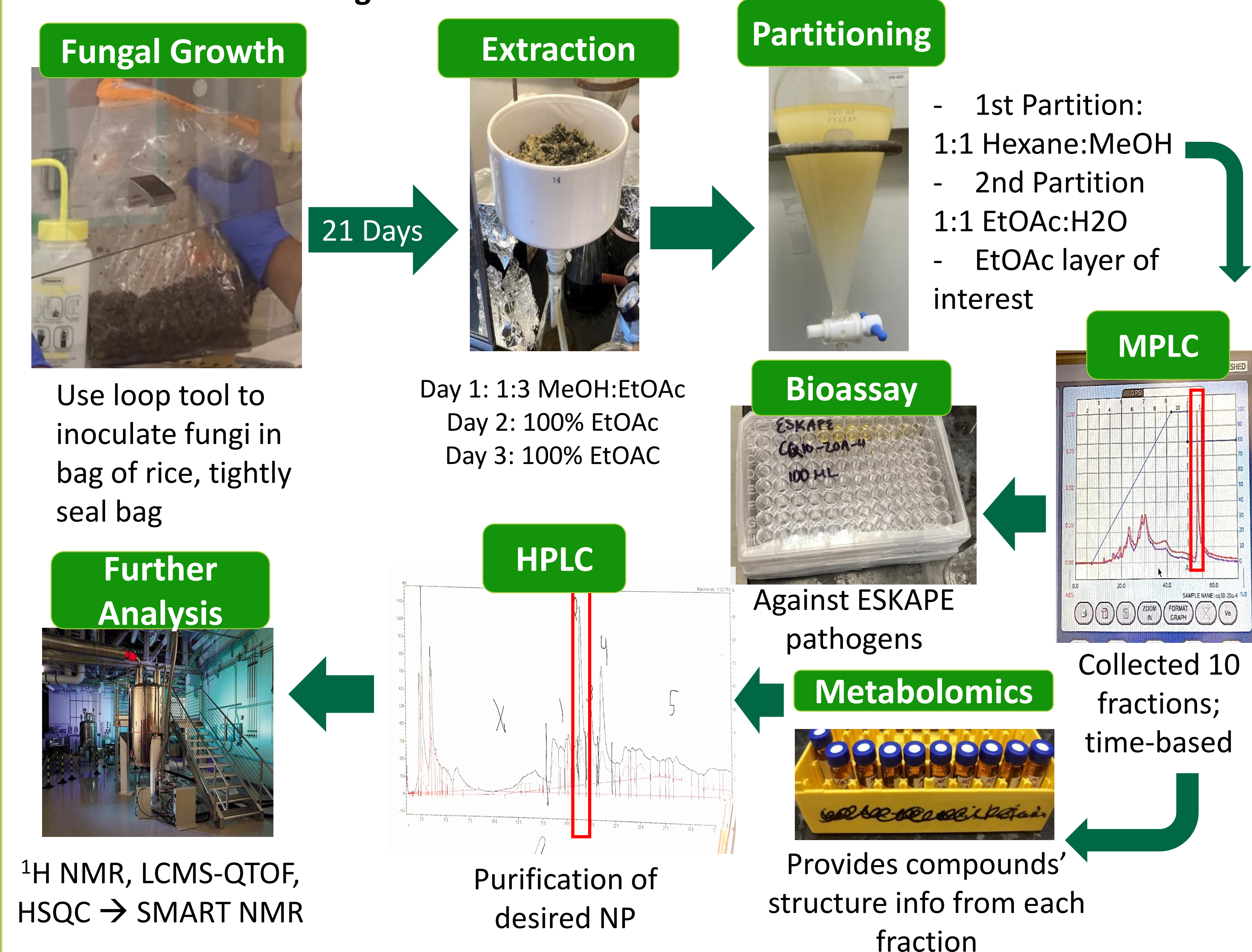


Figure 2. Bioassay of CQ10- 20A-4 Against ESKAPE Pathogens

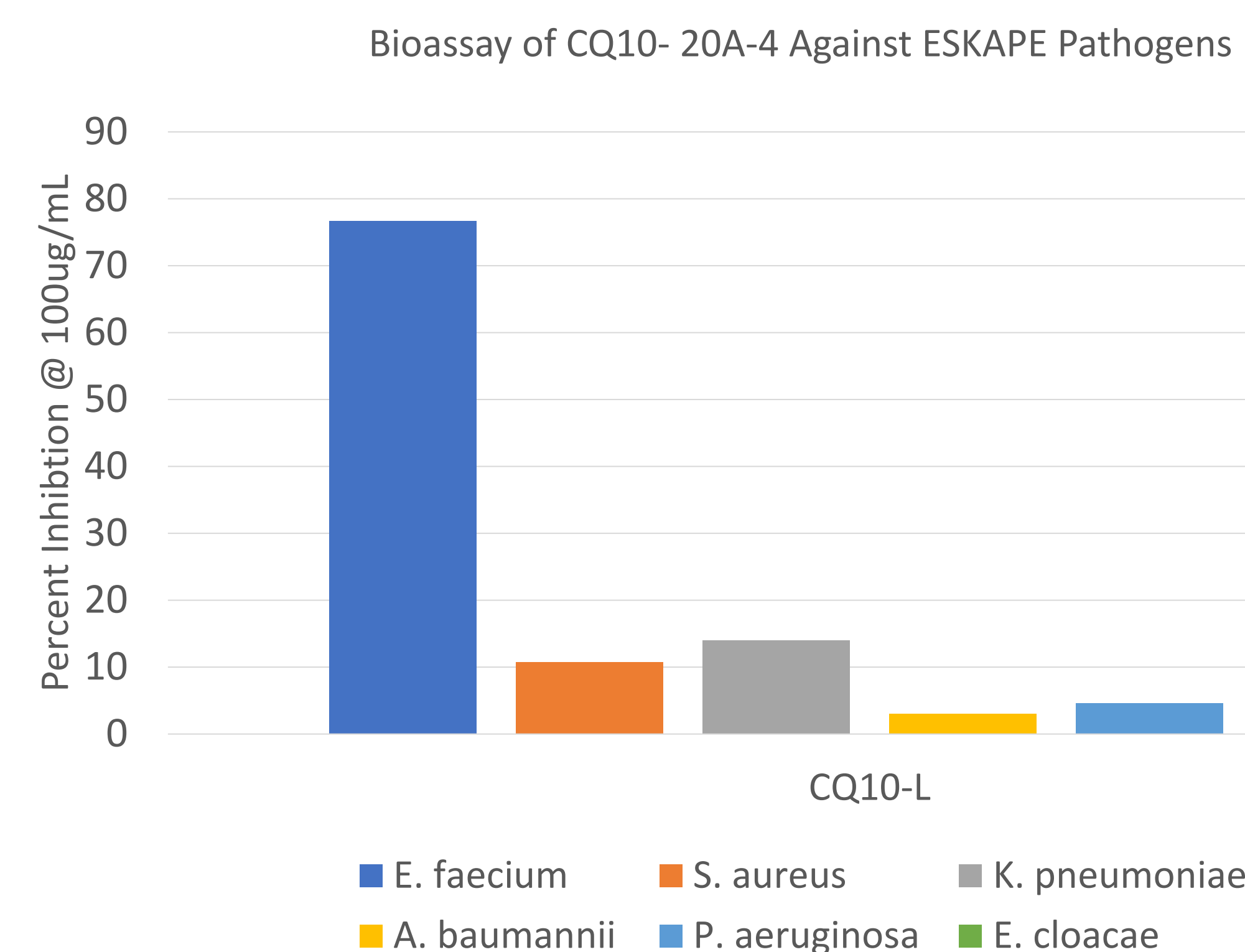


Table 1. Bioassay results from CQ10-L off the MPLC against ESKAPE pathogens

## Results

Figure 3. Liquid Chromatography Mass Spectrometry (LCMS) and Tandem Mass Spectrometry (MS/MS) results from CQ10-L off the MPLC

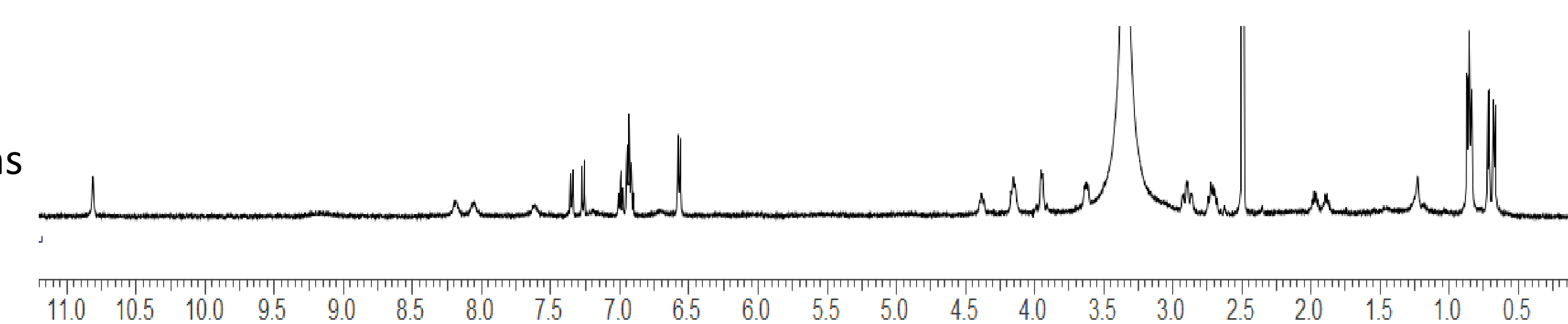
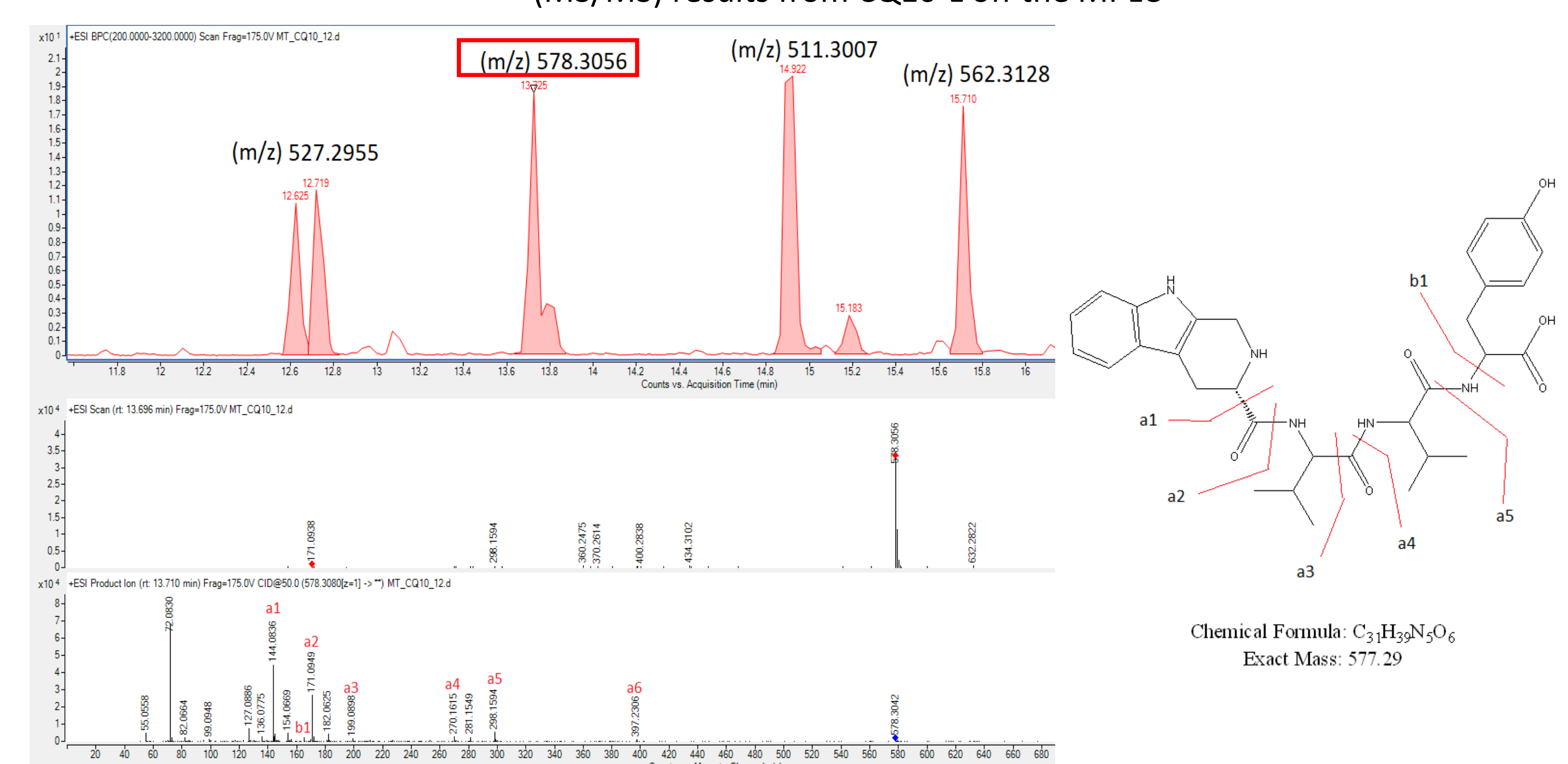


Figure 4. Nuclear Magnetic Resonance (NMR) results from CQ10-L subfraction 2

## Discussion

Bioassay results (Table 1) show that this Fraction CQ10-L is active against the ESKAPE pathogen *E. faecium*. LCMS, MS/MS, (Figure 3) and NMR (Figure 4) analysis indicates the four NPs present in fraction CQ10-L present have the following masses: 510.30 ±.10 amu, 526.29 ±.01 amu, 577.31 ±.01 amu, and 561.31 ±.01 amu. The fragmentation masses shown in the collected MS/MS data matches with the structures made. How these functional groups contribute to antimicrobial activity against ESKAPE pathogens, and *E. faecium* in particular is still unclear. However, Alpha-ergocryptinine with similar functional groups is also known to have antimicrobial effects<sup>4</sup>. This provides ample opportunity to explore structural and functional comparisons.

## Future Works

- The NP present in CQ10-L requires advanced purification better isolate and identify the compound.
- Refer to Global Natural Product Social Molecular Networking database to verify identity compound.
- Compare functional groups with other existing NPs.
- Consider how identified functional groups interact with prokaryotic cell function.

## Contact

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