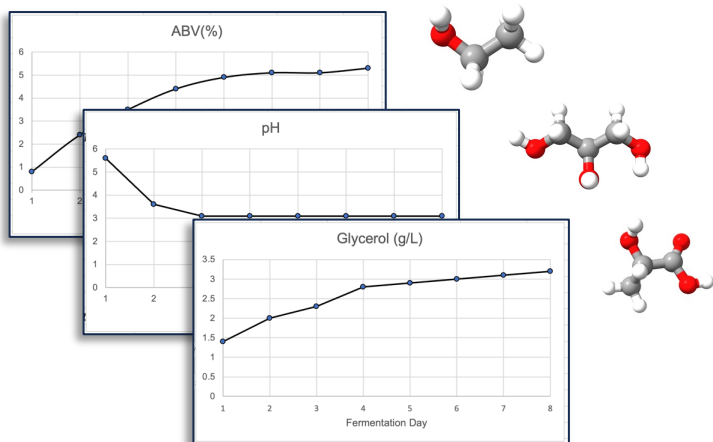


# Translating the Science of Beer to Music

## “The Sound of Beer Flavor: A Multisensory Exploration of Beer Chemistry”



1

### DATA

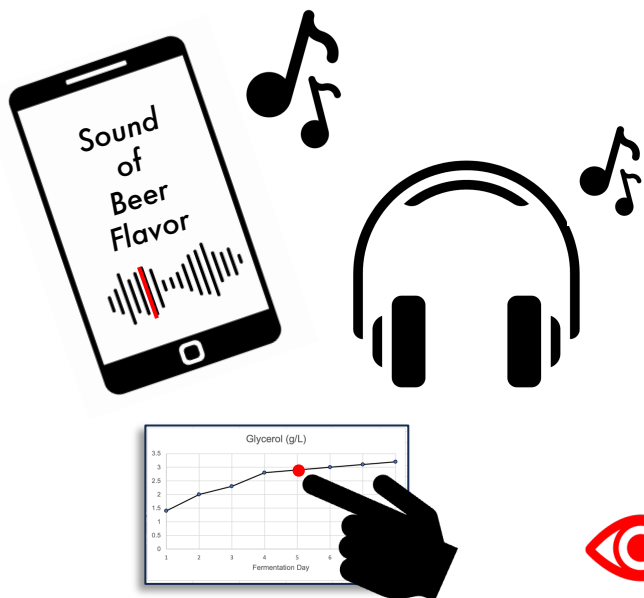
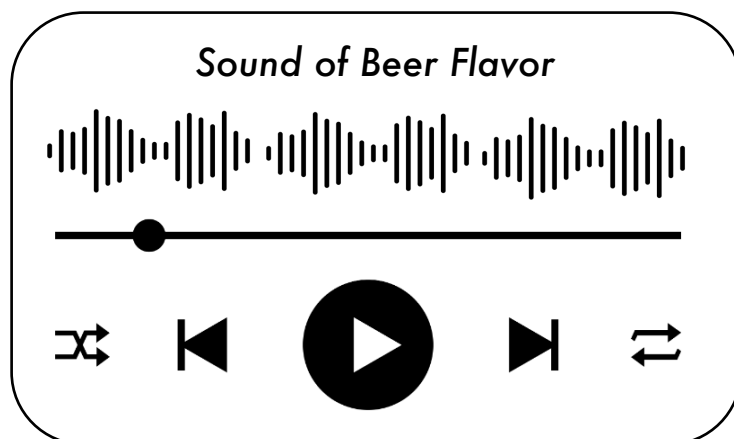
Translating data on yeast-made flavor chemistry in sour beer. . .

Chemical diagrams Courtesy of the NIH  
Data provided by Lachancea LLC

2

### MUSIC

. . . Into sound (and music), in collaboration with North Carolina-based **Sound Artist, Jude Casseday** (AKA: ‘dejacusse’ on Bandcamp) . . .



3

### EDUCATION & ENGAGEMENT

. . . Enabling participants to **hear the flavor data**. This is paired with **graphs of the chemistry of fermentation** to educate people about the science of beer in a **more accessible and inclusive way**.\*

*\*Such “multisensory teaching” approaches—engaging visuals, touch, and hearing—provide an effective and inclusive way to educate diverse audiences, including those with learning disabilities and/or diverse learning needs.*

Sources: Center for Student Achievement Solutions, and The International Dyslexia Association

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## “The Sound of Beer Flavor: A Multisensory Exploration of Beer Chemistry”

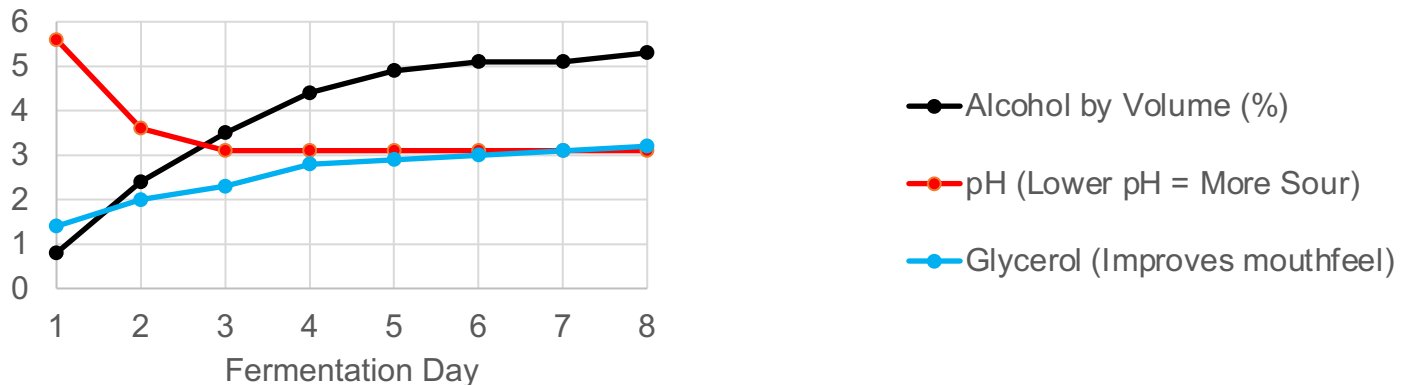
### 1 PROJECT

This project captures the first 8 days of beer fermentation by a unique yeast originally found in wasps and bumblebees, which makes a rapid sour beer without bacteria or additional yeast. The graphs below show three aspects of beer flavor produced by these yeast cells. These data, provided by scientists at **Lachancea LLC**, were sonically translated into music by North Carolina-based sound artist **Jude Casseday** in partnership with **The Microbe Institute**.

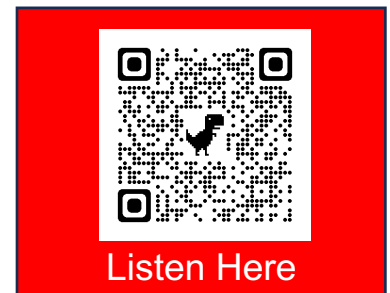
*This “sonification of data” translates 8 days of fermentation data into less than a minute of music.*

### 2 DATA

Beer fermented with an insect-associated, fast-souring *Lachancea* yeast



### 3 MUSIC & AUDIO DESCRIPTION



First, we hear the **buzzing of bees** which eludes to the wasp and bumblebee origins of this unique *Lachancea* yeast. Then the flavor notes resound the instant these yeast cells are added to the malted grains. Fermentation takes off. The alcohol, pH, and glycerol shift rapidly in the first three days of fermentation. **You’ll hear the the alcohol—the resonant bell (black data line)**—rise as the yeast converts sugars in grain into ethanol. At the same time, the **pH—the woodwind (red data line)**—**drops quickly**, as this unique yeast churns out tart lactic acid that increases the acidity of the beer (decreasing the pH). Layered into this is the softer voice of the glycerol. Glycerol has no flavor on its own, but it is a heart note in the beer as it improves mouthfeel. The **glycerol—plucked string (blue data line)**—increases steadily, but very slightly, alongside the alcohol. There is a settling in after the first three days as the flavor tones intertwine and resolve in a slight souring which gives the beer its unique flavor and unique sound.