

# OAK 101

## Oak: The Wood of Choice

- The physical structure of oak makes it an excellent choice for crafting **liquid-tight containers**.
- Oak's chemical complexity offers a multitude of options for creating different flavors while also benefiting a wine's color, mouthfeel and tannin structure.
- Three oak sources for wine barrels:
  - French (Quercus petraea or Quercus sessiliflora)
  - European (Quercus robur)
  - American (Quercus alba)

## Physiology of Oak

Oak structure is unique, possessing an **unusually large cell structure that sets it apart** from most hardwoods and plays an important role in wine maturation.

## Growth Rings

- There are **two distinct bands of growth every year** – the earlywood and the latewood. The earlywood is more porous, therefore the oak extractives are more accessible.

## Radial Rays

- Radial rays run from the center of the tree to the exterior and **act as a semi-permeable barrier to liquid**. They are packed with tannins which benefit wine flavor and mouthfeel. They are also a source of vanillin-rich lignin.

## Tyloses

- These balloon-like cells develop during the transformation of sapwood to heartwood. **Tyloses clog the wood pores**, thereby helping to create liquid-tight barrels.
- Also, tyloses are an **easily accessible source of oak extractives**. Their lignin is particularly vanillin-rich, and they contain tannins that migrate from radial rays when the growth rings in the oak convert from sapwood to heartwood.



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## Oak Chemistry

There are four key components of oak called “oak constituents” and they influence wine and spirits in the following ways:

### Cellulose

- Minimal direct flavor effect
- Transports extractives

### Oak Tannins

- Removal of off-notes
- Subtraction (e.g. vegetal)
- Production of astringency
- Promotion of oxidation products
- Color

### Lignin

- Color
- Increase in blended complexity
- Production of vanilla
- Removal of off-notes
- Subtraction (e.g. vegetal)

### Hemicellulose

- Wood sugars (“body”)
- Toasty characters
- Carmelization Products
- Color

