

WINE CIPHER & CYBER

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“The ideal wine ... satisfies perfectly all five senses: vision by its color; smell by its bouquet; touch by its freshness; taste by its flavor; and hearing by its “glou-glou”.
attributed to the famous chef Paul Bocuse



What is Wine Cipher?

- A lexis derived from simile and metaphor
 - Used to represent ideas of aromas and flavors based on previous experience
- Memory
 - Very short-term or working memory
 - Conversational, real-time functioning (discussing wine with others while tasting)
 - Long-term memory
 - Implicit (riding a bike)
 - Explicit (facts)
 - Episodic memory : specific tasting events
 - Semantic memory : discriminating taste, flavor, aroma, AND language assignments
- Wine experts train within a codified language of associations
 - This wine tastes like cherries, plums, vanilla, spice, and smoke (Tempranillo)

History of Wine Cipher

- Lexis of wine dates back to the Middle Ages in France and Italy
 - Monks were responsible for developments in viticulture and vinification
- Jean Anthelme Brillat-Savarin 1755-1826, Lawyer, Gourmand, Author,
 - His famous work, *Physiologie du goût* (*The Physiology of Taste*), was published in December 1825, two months before his death.
- Wine & Spirits Education Trust
 - United Kingdom circa 1955
 - 369 in the world
- Court of Master Sommeliers
 - Sommelier is a French term for wine steward
 - United Kingdom circa 1969
 - 249 in the world

Deductive Tasting Analysis

Court of Master Sommeliers - Deductive Tasting Method



SIGHT

- **Clarity**
 - Clear/ medium clear/slightly cloudy/cloudy
- **Brightness**
 - Dull/ hazy/bright/day bright/star bright/brilliant
- **Color**
 - Reds: purple/ruby (red)/garnet/orange/brown
 - Whites: clear/green/straw/yellow/gold/brown
- **Concentration:** low/medium/high
- **Rim Variation:** color of rim/edge
- **Gas Evidence**
- **Sediment/Particles**
- **Viscosity:** low/medium/high

NOSE

- **Flaws**
 - Corkiness, H₂S, volatile acidity, brett, oxidation, etc.
- **Intensity:** delicate/moderate/powerful
- **Age assessment:** youth vs. vinosity
- **Fruit:** primary and secondary
- **Non-fruit aromas**
 - Flowers/spices/herbs/botrytis/other aromas
- **Earthiness**
 - Mineral/chalk/stony/dust/mushroom/barnyard/musty
- **Wood**
 - Old vs. new – French vs. American – large vs. barrique

PALATE

- **Sweetness**
 - Bone dry/dry/off-dry/sweet/very sweet
- **Body:** light/med-/medium/med+/full
- **Fruit:** confirm nose
- **Non-fruit flavors:** confirm nose
- **Earthiness:** confirm nose
- **Wood:** confirm nose
- **Tannin:** low/med-/medium/med+/high
- **Alcohol:** low/med-/medium/med+/high
- **Acidity:** low/med-/medium/med+/high
- **Finish:** short/med-/medium/med+/long
- **Complexity:** low/med-/medium/med+/high

INITIAL CONCLUSION

- **Old World/New World**
- **Climate:** cool/moderate/warm
- **Grape Variety/Blend**
- **Age Range**
 - 1-3 yrs./3-5 yrs./5-10 yrs./more than 10 yrs.

FINAL CONCLUSION

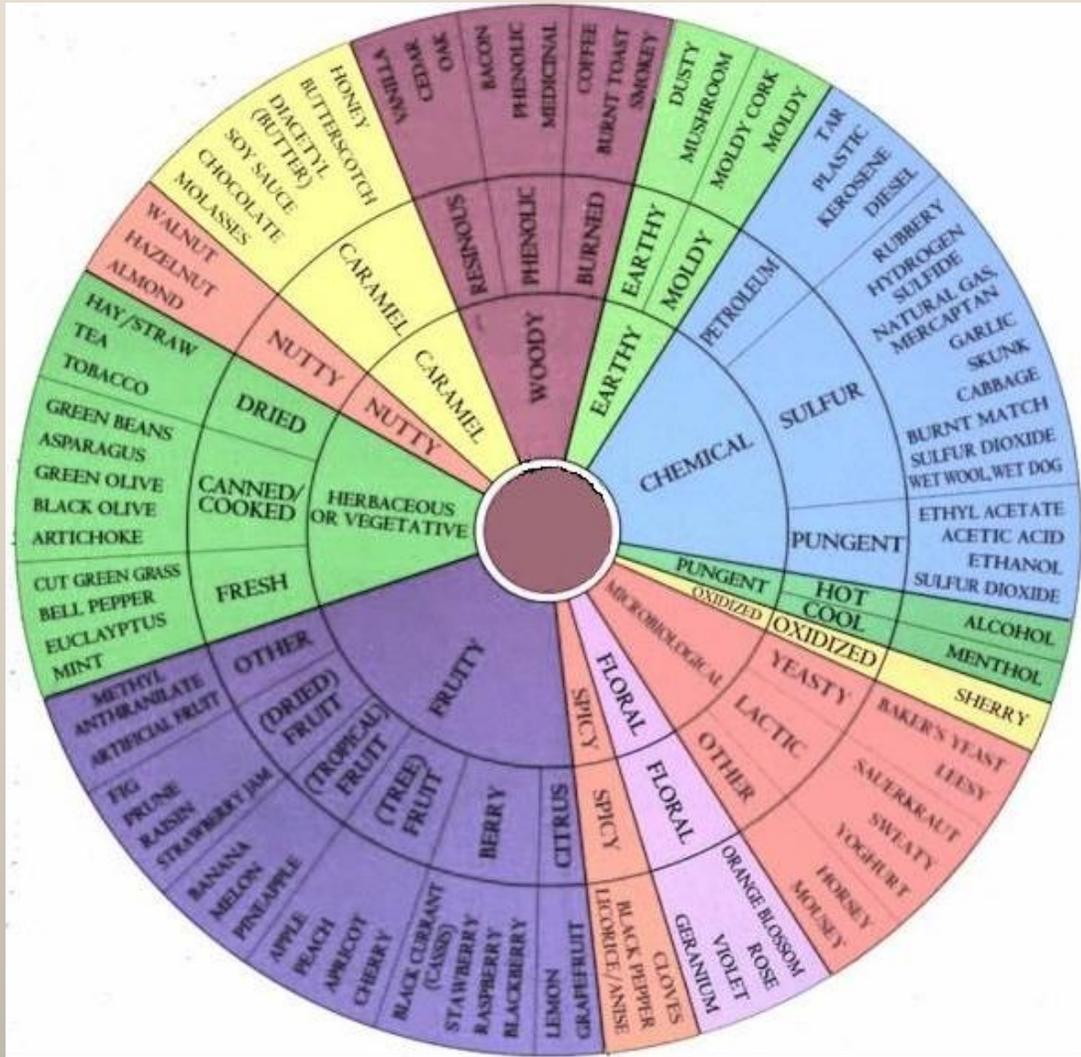
- **Grape Variety/blend**
- **Country/Region/Appellation**
- **Quality level**
- **Vintage**

Globalization & Evolution

- Wine lexicon is quickly evolving due to rapid globalization of the beverage and food industries as well as the floral and perfume industries
- Globally, wine producers, legislators, educators, vendors, and consumers needed a common vernacular in which to communicate

The Aroma Wheel (1984) Dr. Ann Noble

12 Categories of Aromas & Flavors



- Chemical – Includes aromas like sulfur and petroleum
- Pungent – Aromas like alcohol
- Oxidized – Aromas like acetaldehyde
- Microbiological – Aromas like yeast and lactic acid
- Floral – Aromas like *Pelargonium* geraniums and linalool
- Spicy – Aromas like licorice and anise
- Fruity – Aromas like blackcurrant and apricot
- Vegetative – Aromas like eucalyptus and artichoke
- Nutty – Aromas like walnut and hazelnut
- Caramelized – Aromas like butterscotch and molasses
- Woody – Aromas often imparted by oak like vanilla and coffee
- Earthy – Aromas such as mushroom and mildew

Le Nez du Vin (1976)

Professional Olfactory Training Kit





Chemical Composition of Wine

UC Davis Enology Program: wine science expert, Dr. Susan Ebeler

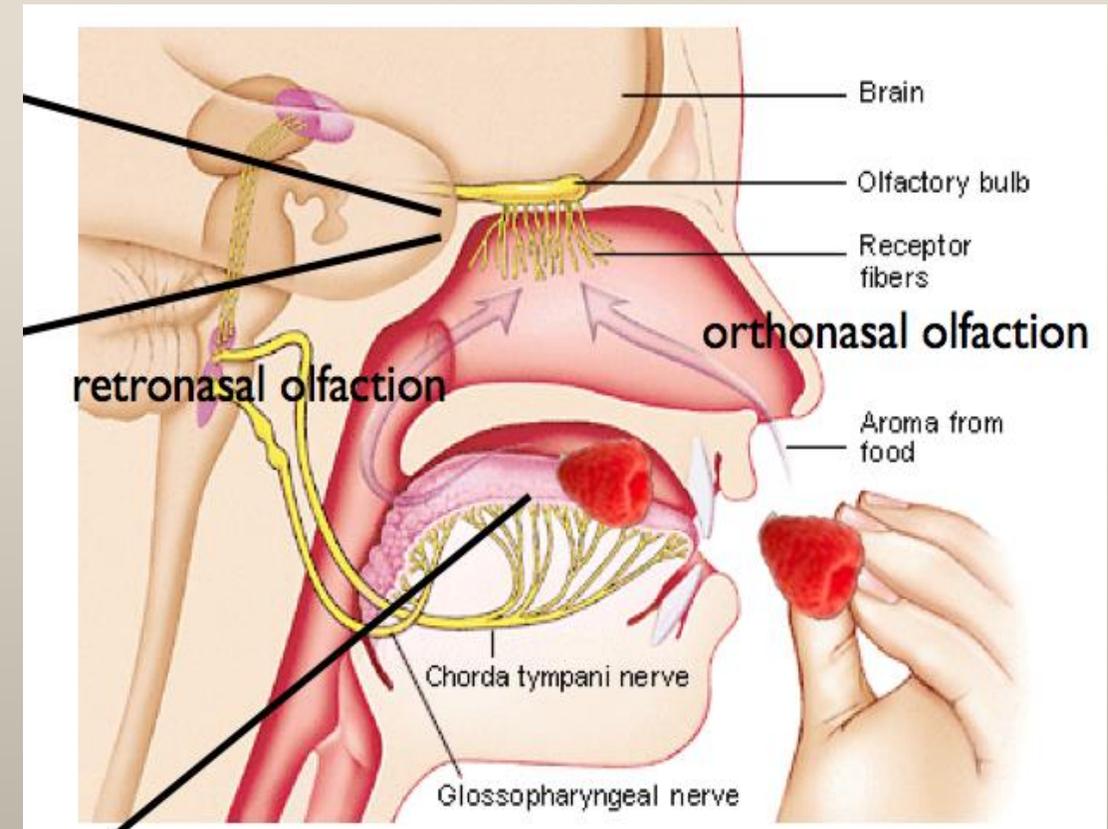
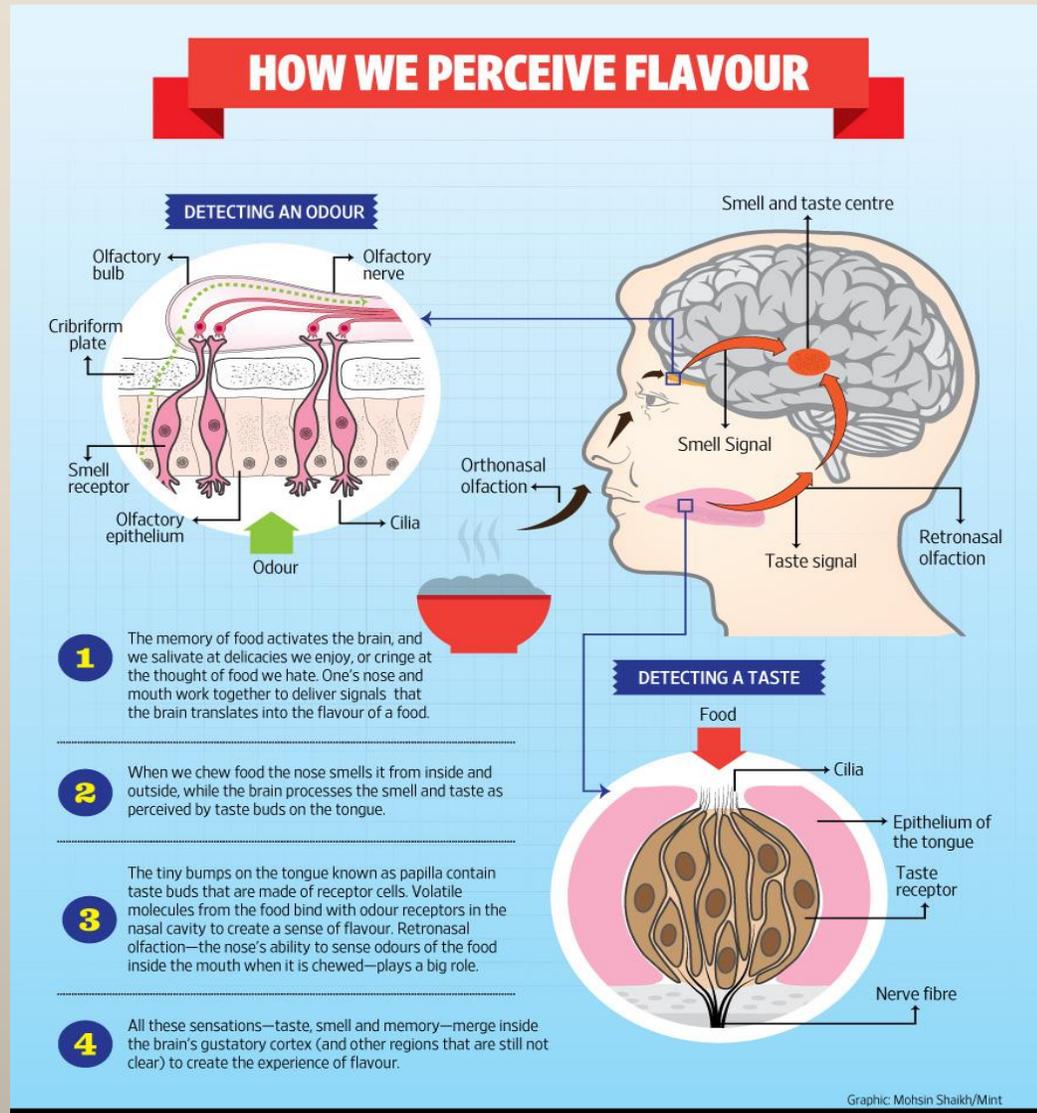
The basic components in wine:

- Grape juice consists of 79% water and 20% carbohydrates, 1% organic acids and trace amounts of glycerol, tannins, phenolics, vitamins, minerals and nitrogenous compounds.
- The sugars, organic acids and phenolics give the juice its flavor, while the vitamins, minerals and nitrogenous compounds are, in many cases, essential to yeast growth and fermentation.
- Wine has a similar composition, but has much lower levels of sugar (none in dry wines), 8 - 17% alcohol and a greater range of minor components.
- Wine can have as many as 300 different volatile aroma molecules making it one of the most complex food objects (bananas have 4 vam)

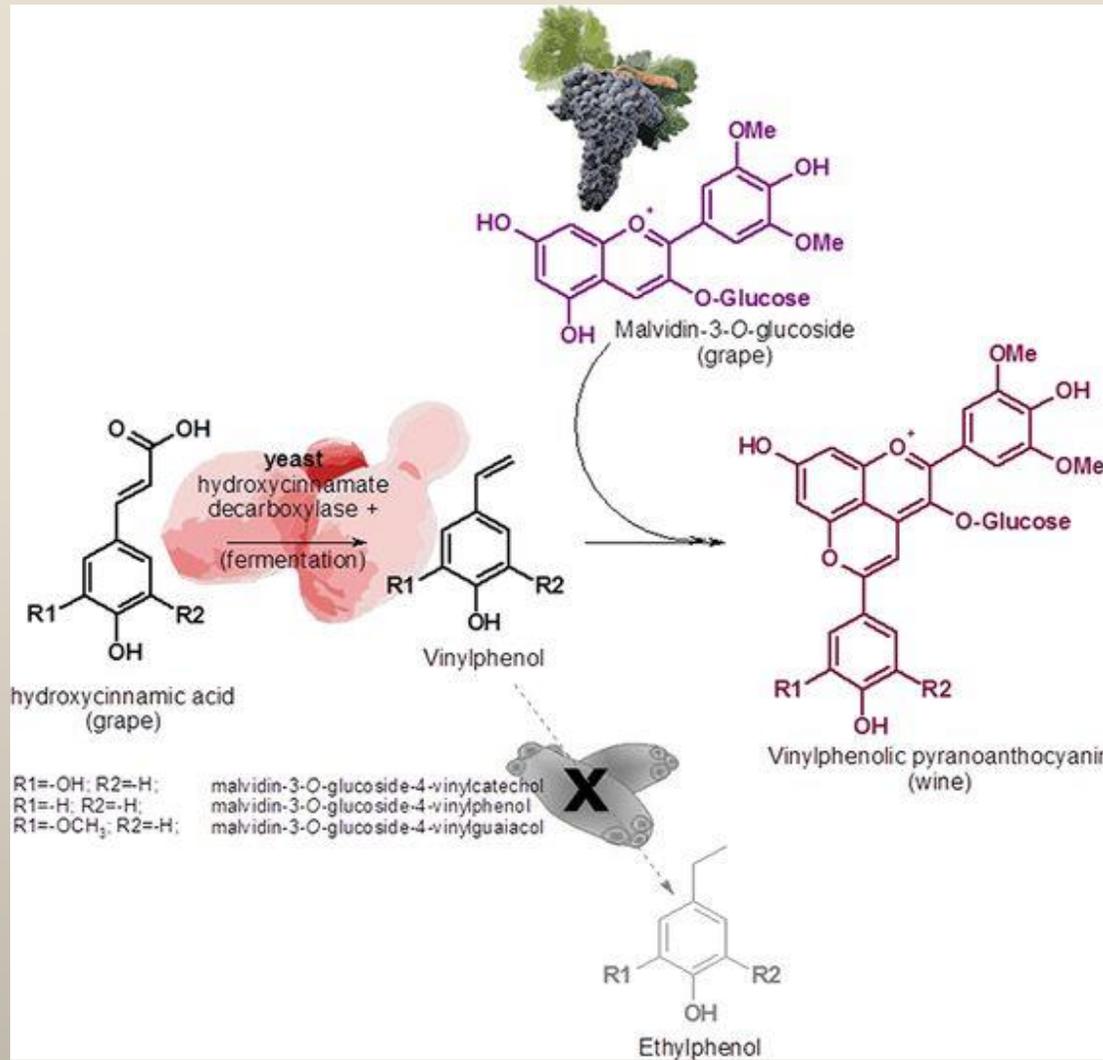
Great wine is a result of balanced components per varietal standards.

Neuroenology

Humans have 350 Olfactory Receptors and can smell 10,000 different volatile aroma molecules
Environment and health affect the mobility of these molecules



Wine Component Molecules & Flavor Chemistry



WINE SIMPLIFIED

The taste and feel of the Italian wine amarone can be reproduced with only 35 chemical compounds, according to enologists.

Puckering Astringent

- ▲ (E)-Cafaric acid
- ▶ Furan-2-carboxylic acid
- ▶ (Z)- & (E)-Aconitic acid
- ▲ Gallic acid (antioxidant)
- ▶ HMW fraction (a high-molecular-weight fraction that includes polysaccharides and tannins)

Bitter Astringent

(High alcohol content increases the perception of bitterness)

- ▶ p-Coumaric acid ethyl ester
- ▶ Gallic acid ethyl ester
- ▶ Syringic acid ethyl ester
- ▶ Vanillic acid ethyl ester
- ▶ Caffeic acid ethyl ester
- ▶ Ferulic acid ethyl ester
- ▶ Protocatechuic acid ethyl ester
- ▶ (+)-Catechin (flavan-3-ol, antioxidant)
- ▶ (-)-Epicatechin (flavan-3-ol, antioxidant)

Velvety Astringent

(Flavonol glucosides and antioxidants provide smoothness)

- ▶ Syringetin-3-O-β-D-glucopyranoside
- ▶ Isorhamnetin-3-O-β-D-glucopyranoside
- ▶ Dihydroquercetin-3-O-α-L-rhamnopyranoside
- ▶ Quercetin-3-O-β-D-galactopyranoside
- ▶ Dihydrokaempferol-3-O-α-L-rhamnopyranoside
- ▶ Quercetin-3-O-β-D-glucopyranoside

Sweet & Mouthful

- ▲ Fructose
- ▶ Glucose
- ▶ L-Proline
- ▲ Glycerol (mouthful)
- ▶ 1,2-Propanediol (mouthful)

Salty

(These compounds help suppress perceived sourness)

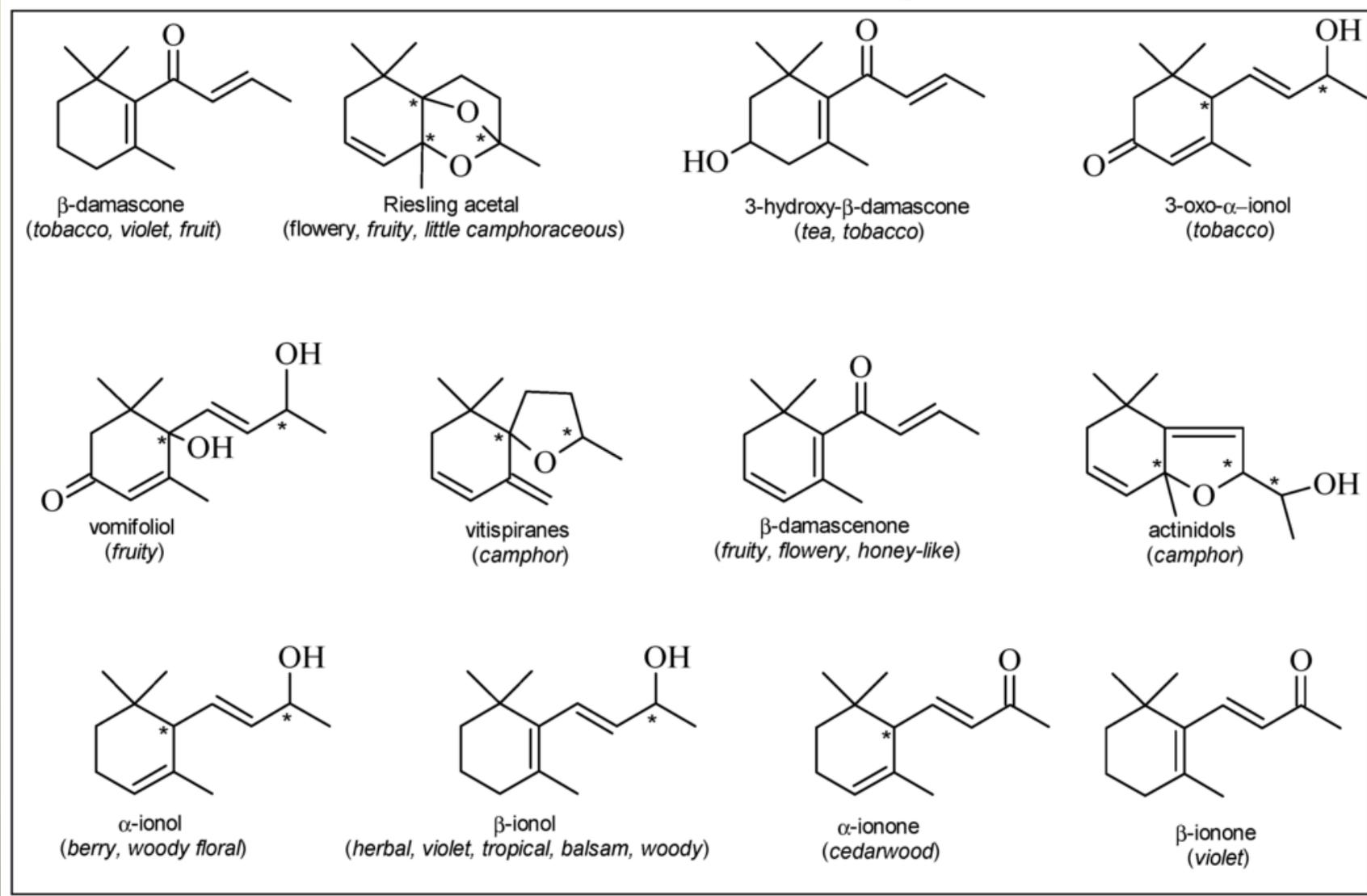
- ▶ Potassium phosphate
- ▶ Magnesium chloride
- ▶ Ammonium chloride

Sour

(These compounds help amplify the puckering astringent perception)

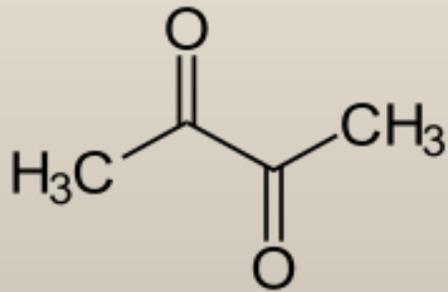
- ▲ Tartaric acid
- ▶ Acetic acid
- ▶ Succinic acid
- ▶ Malic acid
- ▲ Galacturonic acid
- ▶ Lactic acid
- ▶ Citric acid

Wine Aroma Molecules Represent an Idea

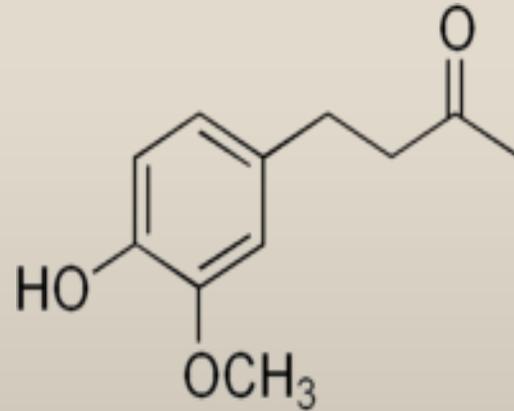


Specific Wine Aroma Molecules

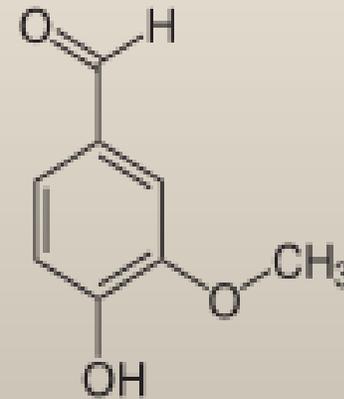
'buttery' with the scientific term 'diacetyl/butanedione,' the molecular formula of $C_4H_6O_2$ pictured here



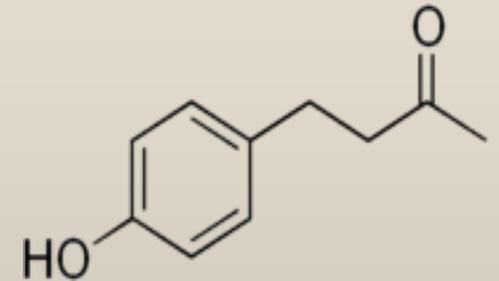
Zingerone / Spice



Vanillin



Raspberry Ketone



AROMAS, AROMAS Y AROMAS

REPRESENTACION VISUAL

UVAS BLANCAS

UVAS TINTAS



CHARDONNAY



CORTESE



PINOT GRIS



BARBERA



CABERNET SAUVIGNON



GAMAY NOIR



RIESLING



SEMILLON



SYLVANER



GARNACHA



MOUVEDRE



PINOT NOIR



VERDEJO



VIIGNIER



PINOT BLANC



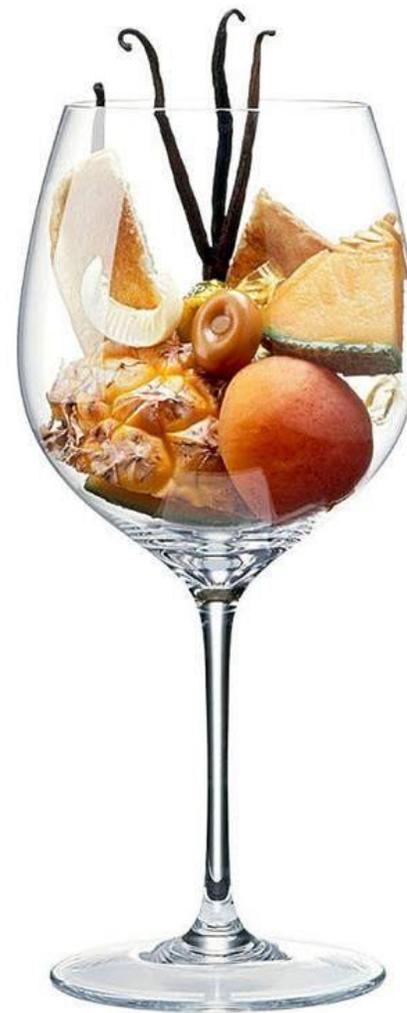
SYRAH



TEMPRANILLO



ZINFANDEL



Chardonnay



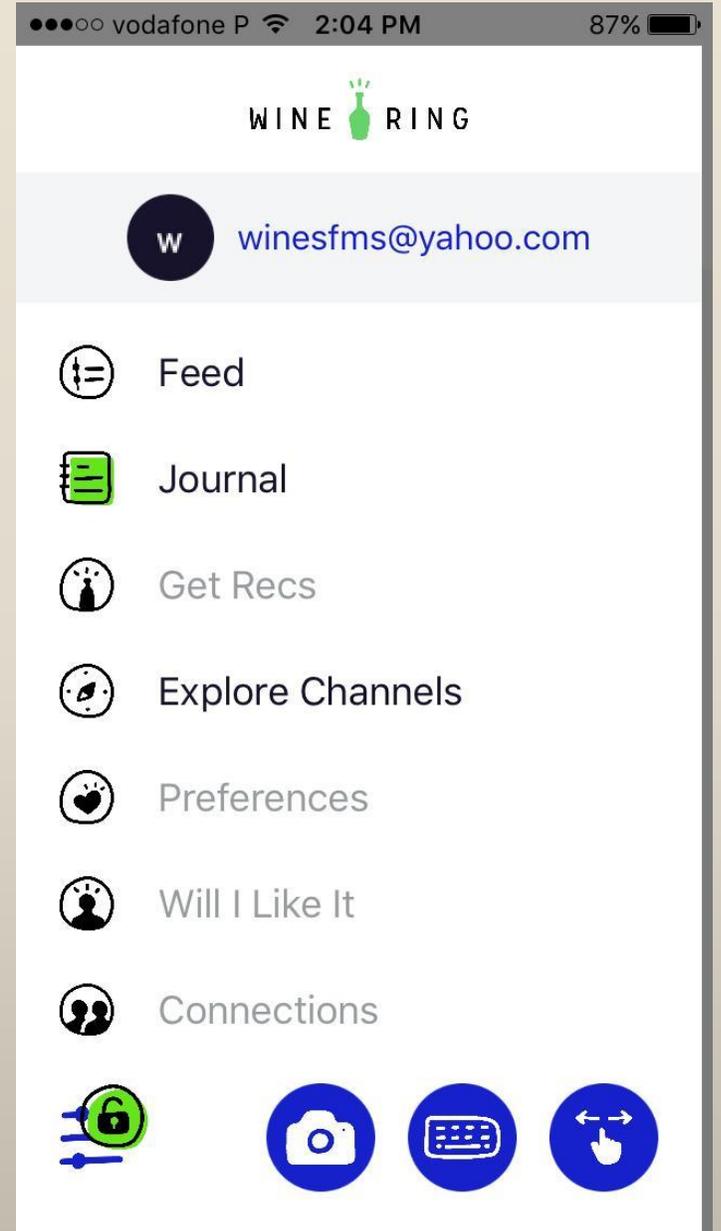
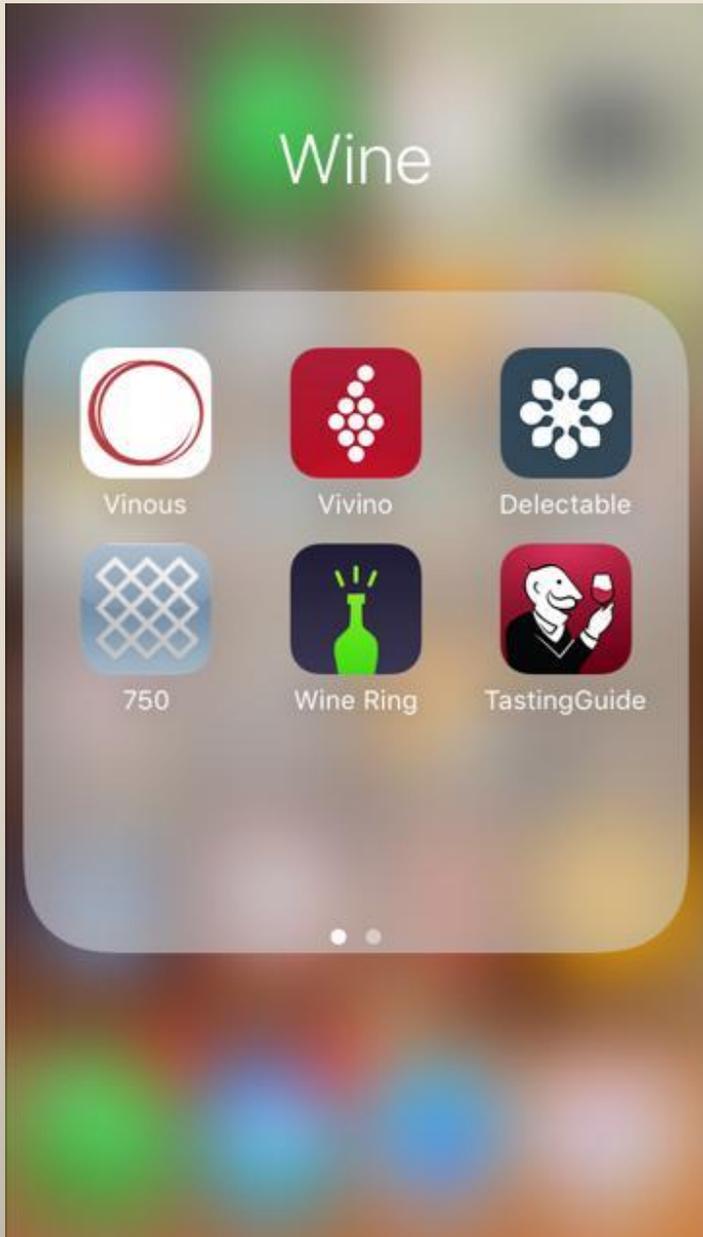
Pinot Noir

The Problem with Wine Cipher

- Highly codified by and for industry insiders
 - Can be alienating and intimidating to consumers
 - Is misunderstood as purely subjective
- Based on abstract notions of flavor and aroma molecules
 - This can be perceived as reductionist
- Requires access to memory place holders (Lychee)
 - ALL vernaculars require exposure and training
 - Medical jargon, Scientific jargon, Physics jargon, Math jargon, Culture Studies jargon

Wine Apps

- Provide interactive access to platforms and database:
 - of tasting notes, wine ratings, label images, wine and food pairing suggestions, vintage charts, cocktail and cooking recipes, pricing, availability, retail information, rebates and coupons, and wide scale global auction options
- Vivino, Delectable, Wine Enthusiast, Vinous, Wine Ring,
- Wine Ring—most legitimate
 - The leading A.I. B2B personalization software on the market
 - 23 Master Sommeliers, Masters of Wine, PhD's, mathematicians, statisticians, and wine industry leaders
 - Considers: age, gender, location, product accessibility, price-range
 - Love | So-So | Dislike : customizes your selection





VIVINO

Buy the best wine

• Antonio Galloni
vinOUS
explore all things wine



DELECTABLE

Drink memorable wine

The Problem with Cyber Wine

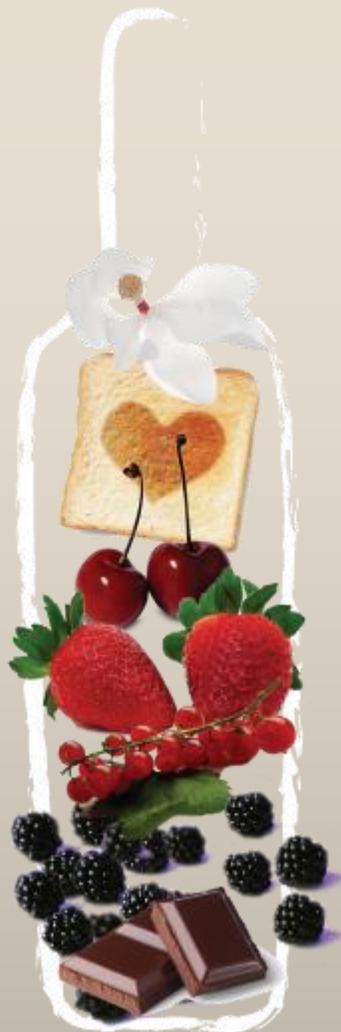
1400 indigenous wine grape varieties in the world

- 20 wine grape varieties make up 80% of all wines produced
 - Cabernet Sauvignon, Merlot, Malbec, Tempranillo, Pinot Noir, Zinfandel, Sangiovese, Nebbiolo, Grenache, Syrah, Cabernet Franc, Pinot Meunier,
 - Chardonnay, Sauvignon Blanc, Riesling, Chenin Blanc, Pinot Gris, Viognier, Macabeo, Airen,
- Influential wine writers, critics, sommeliers, producers, and distributors play it safe by promoting these wines “money makers”
- 95% wine drinkers consume wines primarily made from fewer than these 20 grape varieties

The Problem with Cyber Wine

- 600 years of wine related social and economic engineering
- 2017:
 - 275,7 million hectoliters of wine produced
 - \$340 billion dollars
 - Top FIVE varietals accounted for more than 80% of those sales
 - Cabernet Sauvignon, Merlot, Pinot Noir, Pinot Gris, & Chardonnay
 - All of which are native to France
- **Indigenous wine grapes are being forced into extinction every day, destroying pieces of history, culture, heritage, and tradition.**
- Wine Apps & Cyber wine platforms perpetuate this issue because algorithms are designed to hone in on personal preference and duplicate or repeat those limited selections ad nauseam
 - consumer choice is actually limited over time

“Wine is one of the most civilized things in the world and one of the most natural things of the world that has been brought to the greatest perfection, and it offers a greater range of enjoyment and appreciation than, possibly, any other purely sensory thing.”
Ernest Hemingway



Sources

- **Bibliography and Works Cited**

Brochet, Frédéric, and Denis Dubourdieu. Feb. 2001. "Wine Descriptive Language Supports Cognitive Specificity of Chemical Senses." *Brain and Language*, vol. 77, no. 2, pp. 187–196. Retrieved from www.idealibrary.com, doi:10.1006/brln.2000.2428. (Accessed 16 Dec. 2017).

Brunning, Andrew. "Aroma Chemistry." *Compound Interest*, Retrieved from www.compoundchem.com/category/aroma-chemistry/. Organic Chemistry educator, Cambridge, UK (Accessed 9 March, 2018).

Charters, S. and Pettigrew, S. (2006) "How Effectively Do We Communicate About Wine?" Third International Wine Business Research Conference, Montpellier, 6-8 July 2006. (Research Gate 14 Jan 2014). Retrieved from www.researchgate.net/publication/49284313_How_effectively_do_we_communicate_about_wine. (Accessed 1 Nov. 2017).

Chartier, François, and Levi Reiss. (2012) *Taste Buds and Molecules: the Art and Science of Food, Wine, and Flavor*. Houghton Mifflin Harcourt, Boston, Massachusetts, USA.

Dewey, John. 2005. *Art as Experience*. Berkley Publishing Group.

Eberler, Dr. Susan (unknown) UC Davis Enology Program website, Retrieved from <http://www.caes.ucdavis.edu/about/directory/fsd/fzeberler>. (Accessed January 7, 2018).

Lyons, Will. 9 Jan. 2015. "The Best Wine Apps." *The Wall Street Journal*, Dow Jones & Company, www.wsj.com/articles/the-best-wine-apps-1420722883?ns=prod%2Faccounts-wsj. (Accessed 25 May, 2018).

Morrot, Gil, et al. 28 Aug. 2001. "The Color of Odors." *Brain and Language*, vol. 79, no. 2, pp. 309–320., doi:doi:10.1006/brln.2001.2493. Retrieved from www.idealibrary.com (Accessed July 2013).

Noble, Dr. Ann (unknown) "Aroma Wheel," UC Davis Enology Program website, Retrieved from <http://wineserver.ucdavis.edu/people/emeriti/noble.html> (Accessed January 7, 2018).

Ong, Peter K.C., and Terry E. Acree. 1999. "Similarities in the Aroma Chemistry of Gewürztraminer Variety Wines and Lychee (Litchi Chinesis Sonn.) Fruit." *Journal of Agricultural and Food Chemistry* 47.2 (1999): 665-70. Web. Accessed 2014).

"Plato." *Phaedo: Theory of Forms*, by Plato, ser. 74a-75d. *Internet Encyclopedia of Philosophy*, Retrieved from www.iep.utm.edu/plato/#SH6b. (Accessed 16 Feb. 2018).

Puckett, Madeline (2017) *Wine Folly*, Retrieved from <https://shop.winefolly.com/collections/posters>. (Accessed January 7, 2018).

Shepherd, Gordan. (2017) "Neuroenology: How the Brain Creates the Taste of Wine." New York: Columbia University Press.

Spinner, Simone FM. (Nov. 4, 2014) *Aesthetics & Culture of Wine Master's Thesis*, Denver: University of Colorado, University of Colorado, College of Liberal Arts & Sciences

Spinner, Simone FM. (2012-2017) lecture notes: *Everything You Want to Know About Wine but Were Afraid to Ask / Wine 101, Wine Fundamentals, Wine Chemistry, Taste Like a Pro*, Denver: University of Colorado.

Thach MW, Liz. 24 Jan. 2015, "The State of Wine Drinking in America Today." *The Week - All You Need to Know about Everything That Matters*, theweek.com/articles/532653/www.winebusiness.com. (Accessed 28 May, 2018).