

The background is a dark blue gradient. It features several stylized fireworks in red and white. At the bottom, there are three stars: a red one, a white one, and a blue one. The text 'FIREWORKS & FUN' is prominently displayed in the center.

# FIREWORKS & FUN

**HAPPY  
INDEPENDENCE DAY**

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# INDEPENDENCE DAY

Independence Day, celebrated every year on July 4th, is the most important national holiday in the United States. It marks the Declaration of Independence in 1776 when the thirteen American colonies declared their freedom from British rule. This day is a symbol of liberty, unity, freedom, democracy, and the beginning of a new nation. Every year, Americans celebrate with concerts, parades, fireworks, music, and family gatherings. It is a time to honor the bravery of those who fought for the nation. As fireworks light up the sky, everyone feels hopeful and thankful.



# ARCHAEA? A DIFFERENT DOMAIN?

BY ARNAV KHENI

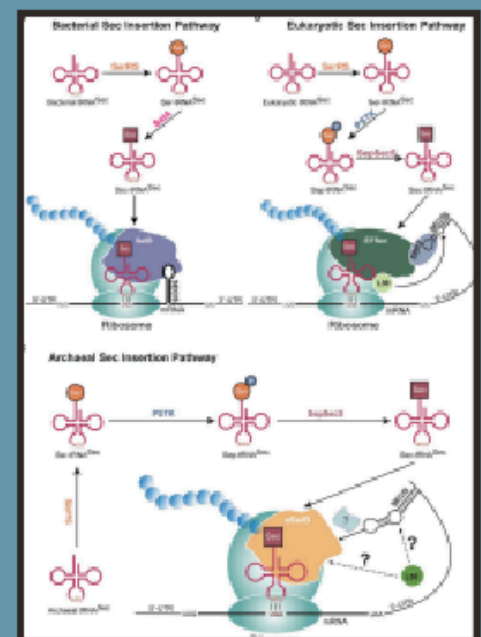
The domain Archaea consists of single-celled microorganisms very similar to bacteria, so much so that it wasn't classified as a different domain until the year 1977 by Carl Woese and George E. Fox. And even then, they were referred to as archaebacteria until recently. Now although archaea have seen a surge in popularity due to their contributions in the field of biotechnology and vital role in PCR, the general public does not know much about them. And while those who paid attention in their biology class may know of archaea, many of them likely do not know the actual differences between archaea and bacteria; that is partly because it is not included in many of the schools' books. But archaea have a lot more to them than just being organisms of another domain. After all, there is a reason behind why they had their name changed from archaebacteria to archaea.

## Now What Makes Them Unique?

*Note: Unless specified, not all of these apply to every species, and some are just tendencies.*

### 1. RIBOSOMES AND RNA

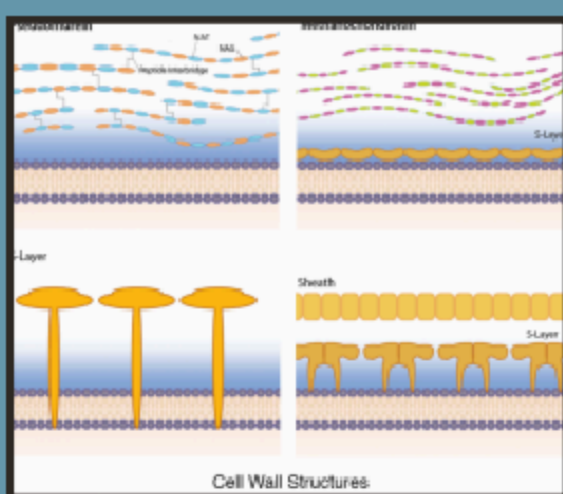
While bacteria and archaea may have 70S ribosomes, they have different rRNA. They have plenty of genetic differences from bacteria, but they have a surprising amount of similarities with eukaryotes. For example, their first start codon in mRNA codes for the amino acid methionine instead of formylmethionine. They also have similar translation initiation factors to eukaryotes. But they also have many differences from eukaryotes regarding lack of post-transcriptional processing and lacking a nucleus.



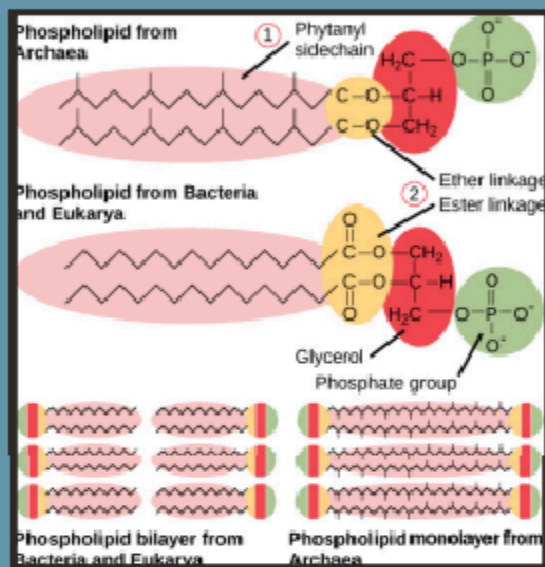
<https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2022.1007832/full>

### 2. CELL MEMBRANE AND CELL WALL





<https://openstax.org/general/cnx-404/>



<https://open.oregonstate.edu/generalmicrobiology/chapter/archaea/>

### 3. STRUCTURE AND SPECIALITIES

Some species within the domain Archaea have structures that are not only unique to archaea, they are also only found in some species. For example, cannulae are hollow-like tubes formed between some marine species of archaea after cell division in order to form a network of cells that are anchored to the surface. Hamus and pili are also similar when it comes to attaching to the surface (the former also networks). And while bacteria also have flagellum, a rigid thread-like filament that rotates for movement, the archaea that do have it power theirs through ATP.

Famously, archaea have some tendencies that they are known for. Many archaea are extremophiles, which are organisms that can survive places with harsh conditions like geysers and volcanoes. Many are also chemotrophs and can metabolize sulfur compounds for food, which comes in handy with sulfuric hot springs. Also, there has yet to a species of archaea that is yet to be identified as pathogenic (cause disease). But a group of archaea called methanogens have some species that are known to symbiotically help pathogenic bacteria, which can promote disease.

Archaea have a vastly different cell membranes and cell walls from eukaryotes and bacteria. Unlike bacteria, the cell walls of archaea lack this compound called peptidoglycan. This compound helps bacteria maintain their shape and resist osmotic pressure and bursting. Some archaea instead use pseudopeptidoglycan, and others use polysaccharides, glycoproteins, protein S-layers, and protein sheaths (lattice structure). Also, some archaea have pseudomurein – which is just a stronger peptidoglycan.

Archaea also have unique cell membranes unlike any other domain, which played a huge part in their classification. Archaea have isoprene (phytanyl) chains in their lipids instead fatty acid chains. These chains can also branch out, unlike fatty acid chains. Also unlike other domains, the chains are attached to their glycerol through ether linkages instead of ester linkages. Furthermore, some species of archaea have a lipid monolayer instead of a lipid bilayer, which helps them survive high temperatures and osmotic pressure.

# ***Nonnas: A Culinary Journey of Love***



Image credit: Reporter Gourmet

## **Celebrating heritage through shared meals**

Experience the heartwarming stories of tradition, family, and passion for cooking through Enoteca Maria located in Staten Island, NY!

*Enoteca Maria is an Italian restaurant which hires grandmothers as chefs. When it first opened in 2007, the owner, Jody "Joe" Scaravella, envisioned a home-style restaurant with real nonnas—or Italian grandmothers.*



Photo: Konstantin Sergeyev

Although the restaurant started with just nonnas (Italian grandmothers) who came from multiple parts of Italy, grandmothers from all over the world have poured their families' rich heritage into Enoteca Maria. In doing so, the nonnas play a vital role in keeping the recipes and traditions of older generations alive.

Joe, the proud owner of the restaurant today, brought Enoteca Maria to life with his late mother's inheritance. Combined with his passion for cooking, his vision involved opening a restaurant to pay tribute to his mother's memory by creating a space where other nonnas, many of whom have also experienced loss or displacement, could have a break from retirement, have fun, and embrace who they are.

Joe's love for his project is reflected in how he makes sure that every nonna feels at home in his restaurant. Often reminiscing about cooking Sunday gravy with his mother who sparked his passion for cooking, he shows respect for each nonna and her culture. This is often mirrored in his fond recollections of his mother who sparked his loving for cooking during his childhood.

Moreover, Joe demonstrated compassion and still paid every nonna even when no customers visited the restaurant within the first two weeks of opening his restaurant. His commitment to develop his restaurant was rooted in honor and building a community founded on love and togetherness.

Enoteca Maria highlights the significance that yof heritage in shaping one's identity and culinary traditions. It goes to show that memories can be transformed into something tangible—something that can cement a long-lasting legacy.





## THE ESSENTIAL ROLE OF MARINE LIFE

Under the sea, a multitude of life thrives in the unknown. Thousands of organisms live their daily lives and call the ocean their home. Each organism has a role to keep the sea healthy. These organisms provide food and shelter, while the ocean helps stabilize the temperature and climate.

For centuries, these ecosystems have only been affected by natural changes on Earth. But human inventions and human activities increasingly threaten these majestic creatures. Ocean acidification is just one of the many threats.

## SEAWATER IS AT RISK

Over the centuries, humankind has made many important inventions, from the development of weapons to the development of the modern car. Cars require fossil fuels, which are burned to release toxic chemicals into the atmosphere. In turn, this causes global warming. Seawater absorbs carbon dioxide and leads to the formation of carbonic acid--the bonding of a hydrogen ion from water and carbon dioxide. Carbonic acid then dissociates, releasing the hydrogen ions, decreasing the pH of the water.

***“To slow ocean acidification, consider leaving a smaller carbon footprint. Consider public transportation or biking to your destinations.”***

# EFFECTS ON ECOSYSTEMS

## *Coral Bleaching*

*Coral affected by ocean acidification*



Photo by the Great Barrier Reef Foundation

Corals build their skeletons by creating calcium carbonate, a compound of calcium and carbonate ions. As the oceans absorb more and more carbon dioxide, more carbonic acid forms. The reduced availability of carbonate ions for corals results in weaker coral reefs more susceptible to habitat destruction.



Image Credit: Wikipedia

## *Predation*

Similar to coral reefs, ocean acidification impacts predator-prey relationships. For example, sharks prey on animals that need coral reefs for survival. But, as coral reefs collapse, these prey populations drop drastically. Along with increased acidity, it also forces prey species to find other places to find shelter and produce offspring. This starves many predators and results in the collapse of many of the important food chains. It's not just marine predators. Even humans eat seafood!



# Dangerously Delicious

Plants that people eat but if they eat it in the wrong way or stage of development they can get sick or die.

## Poisonous if Unripe THE ACKEE

This plant is native to western Africa and is a staple in Jamaica, with it being an additive to stews, curries, and soups. However this can only be done once the fruit has fully opened. The unripe fruits contain hypoglycin A and B. The unripe fruit can have as much as 100x more hypoglycin A compared to its ripe counterparts. Once in the body it breaks down into methylene cyclopropyl acetic acid which can cause seizures, intense vomiting, coma, and death.



STUDIOFOTODFLOREZ/SHUTTERSTOCK

## THE LYCHEE

This plant is native to eastern Asia and is most commonly eaten raw and is generally considered safe to eat. However eating unripe ones can hinder or stop the body's ability to produce sugar which is especially bad for people who haven't are on an empty stomach or have diabetes and can be fatal to young children.

## Poisonous if eaten incorrectly THE ELDERBERRY

Elderberries, most commonly found in Europe and North America, are used in a similar manner as blueberries in which they are used to make jams, juices, and pies. Further more they can actually be used as a natural medicine to treat colds and flu. However this is only when the fruit is cooked. If they aren't cooked, they will, upon digestion, release cyanide into the body which can cause nausea and diarrhea.



<https://www.wilsonbrosgardens.com/SAMBUCA-CANADENSIS-%20ADAMS-AMERICAN-ELDERBERRY-3G.HTML>



[https://siccadania.com/APPLICATIONS/STARCH\\_AND\\_PROTEIN/CASSAVA-TAPIOCA](https://siccadania.com/APPLICATIONS/STARCH_AND_PROTEIN/CASSAVA-TAPIOCA)

## THE CASSAVA

This plant is native to South America and is most commonly eaten either boiled or cooked and is considered safe to eat. It is a starch and is eaten similarly to potatoes however, the skin contains cyanide which can cause nausea, vomiting, seizures, and death.



<https://www.britannica.com/PLANT/APRICOT>

## THE APRICOT

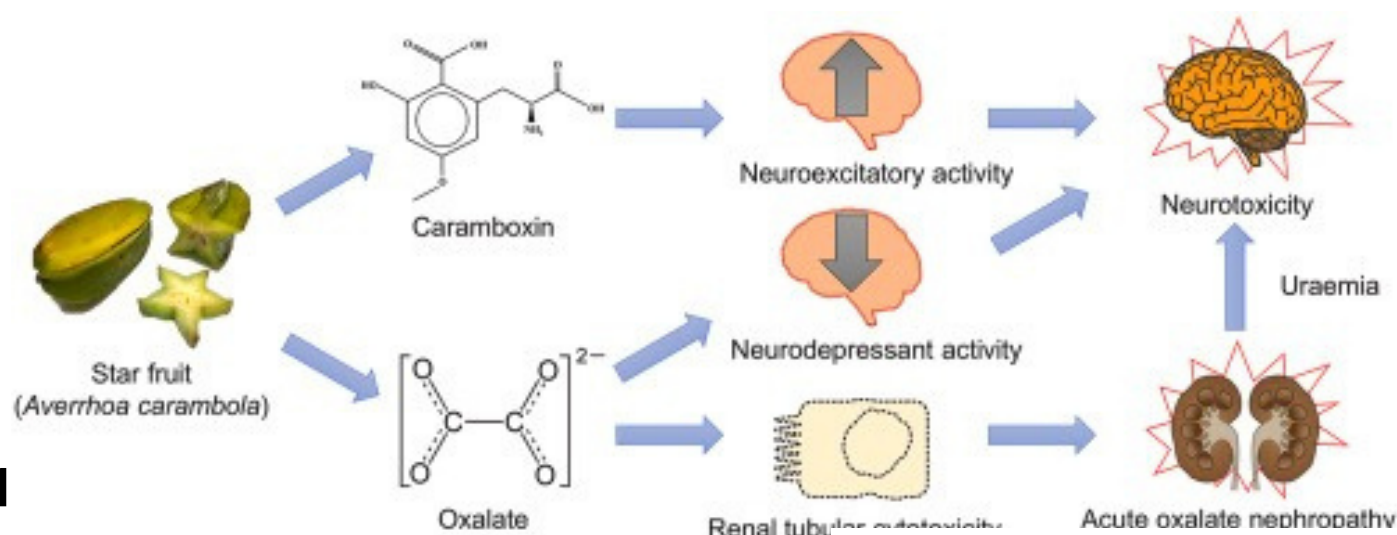
This fruit is eaten all around the world and is commonly eaten fresh or preserved in sugar water. It is also eaten in pies or cakes, however the pit in the center contains cyanide, which can cause nausea, vomiting, and even death.

# POISONOUS IN LARGE AMOUNTS

A good number of plants and vegetables contain trace amounts of poisonous material. However, the effect of such poison will only become apparent if an abundance of such food is consumed.

One such food is bananas, which due to their high potassium content can pose a risk to people with weakened kidneys if eaten in large amounts.

Another fruit like this is starfruit, which contains chemicals that interfere with the nervous system due to a chemical it harbors called Caramboxin. It also contains a chemical called Oxalate which can interfere with proper kidney function.



# WAYMO VS TESLA: THE BATTLE FOR ROBOTAXI



[https://live.staticflickr.com/65535/51689085442\\_5510555490\\_b.jpg](https://live.staticflickr.com/65535/51689085442_5510555490_b.jpg)

## Background

Tesla has officially launched its much-anticipated self-driving taxi service in Austin, Texas. After years of delays, the company is finally putting robotaxis on the road. This service is still limited to geofenced areas. Waymo and Tesla's main rival in the self-driving race begins. Waymo began offering rides in 2018 and removed safety drivers from its vehicles just two years later. Today, it operates in several cities and has completed over 10 million trips.

## Waymo Tech

Tesla and Waymo use very different tools to solve the same problem. Waymo relies on lidar sensors and high-definition maps to navigate. This method provides safety and stability, even if it comes with higher costs.



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcTsgR8PvqH6dg6xoaP9len5VX8fydyFX06Q1Q&s>



## Tesla Tech

Tesla's approach is the opposite. It uses a vision-based system powered entirely by cameras. This setup is cheaper and easier, but also rises. Tesla is betting that with enough data and machine learning, cameras alone are able to handle everything. Waymo runs its own and partners with companies like Uber and Lyft to offer rides. Tesla, on the other hand, aims to build a proprietary robotaxi platform, allowing owners to deploy their vehicles as robotaxis, earning money while Tesla takes platform fees.



<https://heute-at-prod-images.imgix.net/2025/06/23/03ffc8fc-23ae-4e34-b6bd-2877d0230dfa.jpeg?rect=0%2C417%2C4000%2C2250&auto=format>

## Who Will Win?

Waymo has built a solid track record for safety, which has helped it to gain trust. Tesla's first day didn't go well. Some users reported issues. These early problems are common with new systems; Tesla may need time to improve. Waymo is ahead, but Tesla is just getting started.

# 时令特饮，将夏日封存于杯中

七月的湾区，是属于水果的季节。从超市货架到农夫市场的摊位，再到自家的后院，处处都被饱满鲜亮的夏日果实占满，空气中弥漫着甜蜜的香气。面对大自然如此慷慨的馈赠，我们不如就用最简单的方式，将这份甘甜化作一杯清凉。

抛开繁复的配方，只取最新鲜的水果、几块晶莹的冰块，再兑上充满活力的气泡水——几款高颜值、零失败的夏日特饮，就在你的手中诞生了。

来吧，让我们在这个七月的午后，择一段慵懒时光，与家人、朋友一同将对生活的热爱与四季的馈赠悉数装进这杯清饮。



<https://wallpaperdelight.com/wp-content/uploads/2024/06/A-wallpaper-with-a-tropical-theme-showcasing-various-fruits-mixed-among-palm-leaves-and-flowers-creating-a-summer-and-vacation-ambiance.jpg>



# 迷迭香浆果气泡水 (Rosemary Berry Sparkler)

## 推荐理由 Why We Love It

经典莓果加一抹香草迷迭香，酸甜与清新草本完美平衡，风味层次高级，视觉与味觉双重惊喜。

An elegant twist on classic berries—with a hint of rosemary, sweet and tart meet herbal freshness for a sophisticated sip.

## 制作步骤 Method

### 1. 捣制浆果 Muddle Berries

- 在玻璃杯底放入 10–15 颗覆盆子 (raspberries)，用勺背轻轻捣压 (muddle)，释放出果汁。
- 加入 1 茶匙蜂蜜 (honey)，轻轻搅拌均匀。

### 2. 分层组合 Layering

- 填入冰块 (ice cubes) 至杯中八分满。
- 插入新鲜迷迭香枝 (rosemary sprig)。
- 撒入剩余的完整覆盆子和蓝莓 (raspberries & blueberries)。

### 3. 注入气泡 Sparkling Finale

- 缓缓倒入 250 毫升冰镇气泡水 (sparkling water)，留约 1 cm 空隙，防止溢出。
- 轻轻搅拌几下，让气泡带动果香与迷迭香香氛均匀散布。

## 材料清单 Ingredients

- 新鲜覆盆子 15–20 颗 (Fresh Raspberries, 15–20 pcs)
- 新鲜蓝莓 10–15 颗 (Fresh Blueberries, 10–15 pcs)
- 新鲜迷迭香 1 小枝 (Fresh Rosemary Sprig, 1 sprig)
- 蜂蜜 1 茶匙 (Honey, 1 tsp)
- 冰块 适量 (Ice Cubes, as needed)
- 冰镇气泡水 250 毫升 (Chilled Sparkling Water, 250 ml)



# 西瓜球薄荷气泡水 (Watermelon Mint Sparkler)

## 推荐理由 Why We Love It

纯粹的夏日味道，清爽解渴，制作简单，色彩鲜艳，是派对上的无酒精明星。

The essence of summer—bright, refreshing, and effortlessly fun; the non-alcoholic star of any gathering.

## 材料清单 Ingredients

- 无籽西瓜 ½ 个 (Seedless Watermelon, ½ pc)
- 新鲜薄荷叶 一小把 (Fresh Mint Leaves, a small handful)
- 冰镇气泡水 500 毫升 (Chilled Sparkling Water, 500 ml)
- 青柠 1 个 (Lime, 1 pc)

## 制作步骤 Method

### 1. 制球 Make Watermelon Balls

- 用挖球器 (melon baller) 在西瓜果肉上挖出均匀的西瓜球 (watermelon balls)。

### 2. 冷冻增味 Freeze for Flavor

- 取一半西瓜球平铺于烘焙纸上，冷冻至少 4 小时，制成天然“风味冰块” (natural flavored ice cubes)。

### 3. 分层组合 Layering

- 在玻璃杯底放入少量薄荷叶和西瓜汁。
- 加入部分新鲜西瓜球和部分冻西瓜球 (fresh & frozen watermelon balls)。

### 4. 注入气泡 Sparkling Finale

- 缓缓倒入 500 毫升冰镇气泡水 (sparkling water)，留约 1 cm 空隙。
- 根据口味，即可挤入几滴青柠汁 (fresh lime juice) 增添酸爽。





# 芒果椰奶气泡水 (Mango Coconut Milk Sparkler)

## 推荐理由 Why We Love It

充满热带风情，口感层次丰富；椰奶的醇厚与芒果的香甜在气泡的催化下完美融合。

Tropical richness meets fizzy delight—creamy coconut milk and sweet mango unite for a refreshing escape.

## 制作步骤 Method

### 1. 制冰球 Make Coconut Milk Ice

- 将全脂椰奶倒入球形或方形冰格，冷冻4小时以上，制成椰奶冰球 (coconut milk ice balls)。

### 2. 准备芒果 Prep Mango

- 芒果去皮去核，切成小丁 (mango dice)。

### 3. 捣制芒果泥 Muddle Mango Purée

- 取约  $\frac{1}{3}$  的芒果丁与1茶匙蜂蜜放入小碗，用杵或勺背捣成细腻芒果泥 (mango purée)。
- 加入几片薄荷叶 (mint leaves)，轻轻拍打 (muddle)，静置1-2分钟，释放清香。

### 4. 分层组合 Layering

- 在玻璃杯底依次放入：
  - 一层芒果泥 (mango purée)
  - 一层芒果丁 (mango dice)
- 再放入冻好的椰奶冰球至杯容  $\frac{2}{3}$ ，需更冷可加适量冰块 (ice cubes)。

### 5. 注入气泡 Sparkling Finale

- 缓缓倒入冰镇气泡水 (sparkling water)，留约1-2 cm 空隙，避免溢出。
- 轻轻搅拌，使气泡与果香、椰香充分融合。

## 材料清单 Ingredients

- 成熟芒果 1-2 个 (Ripe Mango, 1-2 pcs)
- 全脂椰奶 250 毫升 (Full-fat Coconut Milk, 250 ml)
- 新鲜薄荷叶 一小把 (Fresh Mint Leaves, a small handful)
- 蜂蜜 1 茶匙 (Honey, 1 tsp)
- 冰块 适量 (Ice Cubes, as needed)
- 冰镇气泡水 500 毫升 (Chilled Sparkling Water, 500 ml)





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