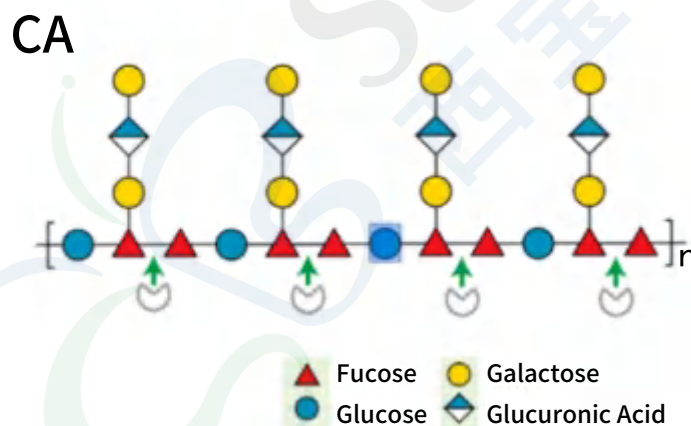


# Colanic Acid's Physicochemical Characteristics and Application Prospects

Colanic acid (CAS: 9012-87-7) is an extremely valuable functional ingredient choice in formulations for functional foods, cosmetics, and personal care products due to its unique loose porous structure, hydrophilic properties, and potential bioactivity. It has a wide range of applications in the food, cosmetics, and pharmaceutical healthcare industries.

Colanic acid is an extracellular polysaccharide synthesized by bacteria. It serves as a chemical defense substance to protect cell surfaces and aid in the formation of biofilms. Colanic acid consists of a heteropolymeric polysaccharide with a repeating hexamer unit composed of glucose, galactose, fucose, and glucuronic acid. It also includes O-acetyl and pyruvic acid side chains surrounding these sugar molecules.



## Food Applications

Colanic acid, as a polysaccharide substance, holds vast potential in the food industry. Its molecular structure forms a spherical chain that exhibits viscosity in aqueous solutions, particularly displaying viscoelastic properties at high concentrations. Microbial extracellular polysaccharides like colanic acid have unique functions in the food industry, including applications in fermented dairy products, bread, and more. Under different induction conditions, colanic acid can produce water gels with varying properties, enhancing moisture retention and providing innovative solutions for the food industry.

## Daily Care Applications

---

Colanic Acid (CA) holds multifaceted potential. Its porous cellulose structure and abundant hydrophilic groups allow it to form an exceptional hydrogel on glucuronic acid surfaces, exhibiting outstanding water-retention capabilities and a soft texture. These unique properties position Colanic Acid as an ideal candidate for skincare applications.

CA is an extracellular polysaccharide synthesized by *Escherichia coli* and is part of the biofilm matrix, presenting a wide range of potential applications in cosmetics, food, and pharmaceutical industries. Additionally, one of the components in CA, L-rhamnose, displays various physiological activities such as skin whitening, anti-inflammatory, and anti-tumor properties. The porous cellulose structure and numerous hydrophilic groups in CA enable it to form a high-quality hydrogel with excellent water-retention capabilities and a soft texture on glucuronic acid surfaces. Therefore, in the cosmetics and healthcare markets, Colanic Acid is poised to become an ideal application candidate.

### **Healthcare Applications: Significantly Extending Lifespan, Anti-Inflammatory, Anti-Tumor, and Inhibition of Alzheimer's Beta-Amyloid Accumulation**

Focusing on the potential medical applications of Colanic Acid, particularly its role in extending lifespan, reveals certain mutations in gut bacteria lead to excessive Colanic Acid production, thus extending the lifespan of nematodes. This phenomenon is closely related to the regulation of mitochondrial fission and fusion processes, in which Colanic Acid exerts an influence. Further research has confirmed that by knocking out specific bacterial genes, nematodes are not only protected from tumor growth but can also suppress the accumulation of beta-amyloid, one of the characteristics of Alzheimer's disease. This discovery highlights the critical role played by gut microbiota and Colanic Acid in regulating lifespan and preventing age-related diseases.

| Product Name | CAS       | Item     | Purity                 | Sizes           |
|--------------|-----------|----------|------------------------|-----------------|
| Colanic Acid | 9012-87-7 | DCJ0824D | 97%, Biochemical Grade | 1g; 10g         |
| Colanic Acid | 9012-87-7 | DCJ0824C | 98%, Standard Grade    | 100mg           |
| Colanic Acid | 9012-87-7 | DCJ0824B | 95%, Food Grade        | 100g; 1Kg; 25Kg |
| Colanic Acid | 9012-87-7 | DCJ0824A | 95%, Cosmetic Grade    | 100g; 1Kg; 25Kg |

## Reference

1. Jun Qiao. Colanic acid: biosynthetic overproduction by engineering *Bacillus subtilis* and characterization of physical properties. DOI: 10.1021/acs.jafc.1c04823
2. Dilhun Keriman Arserim Ucar. Exopolysaccharides in Food Processing Industrials. DOI.10.1007/978-3-030-75289-7\_8
3. Jiaxin Wu. Regulating Cardiolipin Biosynthesis for Efficient Production of Colanic Acid in *Escherichia coli*. DOI.10.1021/acs.jafc.3c01414
4. Dan Liu. Production of bacterial cellulose hydrogels with tailored crystallinity from *Enterobacter* sp. FY-07 by the controlled expression of colanic acid synthetic genes.. DOI.10.1016/j.carbpol.2018.12.014
5. Eun Ju Yun. Increased Production of Colanic Acid by an Engineered *Escherichia coli* Strain. Mediated by Genetic and Environmental Perturbations. DOI.10.1007/s12010-021-03671-0
6. Bing Han. ‘Inside Out’ – a dialogue between mitochondria and bacteria. DOI.10.1111/febs.14692



**Service Hotline:** 400-021-8158

**International Market:** [www.allinno.com](http://www.allinno.com)

**Website:** [www.seebio.com/](http://www.seebio.com/) [www.seebio.cn](http://www.seebio.cn)

**E-mail:** [foodadd@seebio.cn/](mailto:foodadd@seebio.cn) [finechem@seebio.cn/](mailto:finechem@seebio.cn) [sales@seebio.cn/](mailto:sales@seebio.cn) [market@seebio.cn](mailto:market@seebio.cn)

**Address:** Building 5, No. 508 Chuanhong Road, Pudong, Shanghai 201202, P.R.China

