# Gellan Gum


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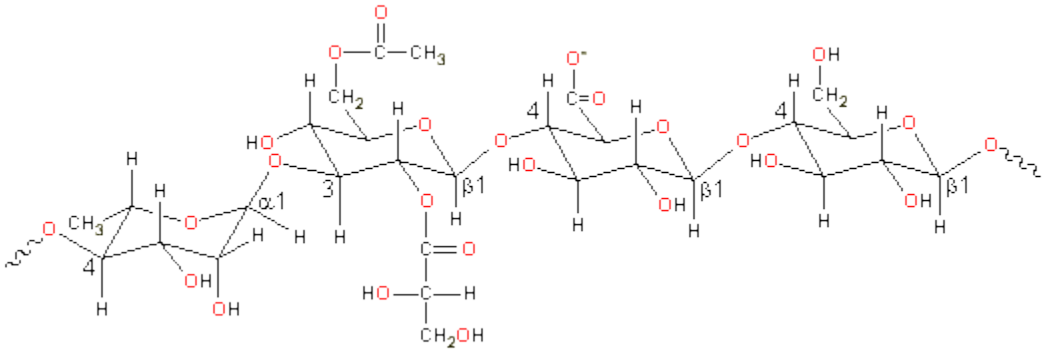
Gellan gum (E418) is a bacterial exopolysaccharide, discovered through the screening of thousands of bacteria and prepared commercially by aerobic submerged fermentation from *Sphingomonas elodea* (previously called *Pseudomonas elodea*) [502], in a manner similar to xanthan.

## Structural unit



Gellan gum is a linear tetrasaccharide ⟶4)-L-rhamnopyranosyl-(α-1⟶3)-D-glucopyranosyl-(β-1⟶4)-D-glucuronopyranosyl-(β-1⟶4)-D-glucopyranosyl-(β-1⟶ with O(2) L-glyceryl and O(6) acetyl substituents on the 3-linked glucose [1570]. It has high molecular weight, consisting of about 50,000 residues and is normally de-esterified by alkali treatment before use in food.

## Molecular structure

Gellan gum forms a coaxial triangular 3-fold double helix (pitch 56.4 Å) from two left-handed chains coiled around each other [1786] with the acetate residues on the periphery and glyceryl groups stabilizing the interchain associations. Hydrogen-bonds are formed between the hydroxy methyl of 4-linked glucosyl units of one chain and the carboxylate group of other. There are ion-binding sites by both carboxylate oxygen atoms and a hydroxyl group in one chain and two hydroxyl groups in the other plus one strongly-bound water molecule. Pairs of helices may form antiparallel junction zones with $Ca^{2+}$.

## Functionality

Gellan gum is used as a gelling, texturizing and suspension hydrocolloid and is functional at very low levels in the presence of ions. Its setting point depends on the ions present and their concentration [1594]. The functionality depends on the degree of acylation and the ions present. If left acylated, gellan forms soft, elastic, transparent and flexible gels but once de-acylated it forms hard, non-elastic brittle gels. A gellan gum solution may invisibly hold particles in suspension but, unlike other gelling agents, without significantly increasing the solution's viscosity. As firm but brittle gels, they crumble in the mouth to cleverly mimic the 'melting in the mouth' sensation sensation with the release of water and associated flavors from the weak gel network.

A gel sol transition occurs at about 50 °C dependent on concentration. Thermoreversible gels form on cooling in the presence of cations even at low (0.1% w/w) to very low (0.005% w/w) concentrations.

Source : http://www1.lsbu.ac.uk/water/hygellan.html