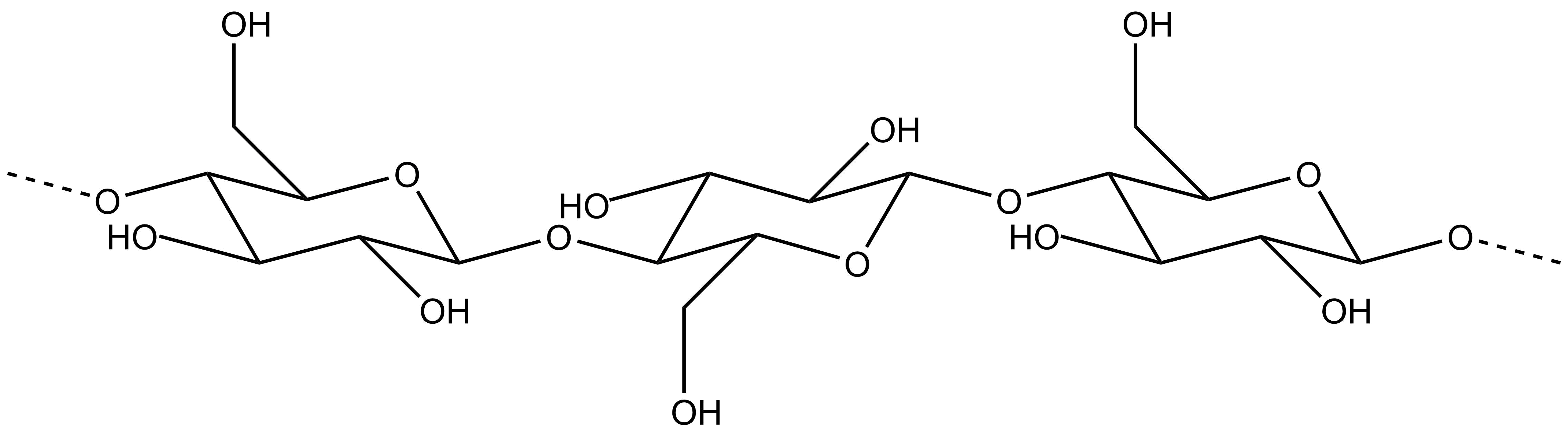
**Biopolymers**

Lots of living creatures make polymers. These are sometimes called biopolymers.

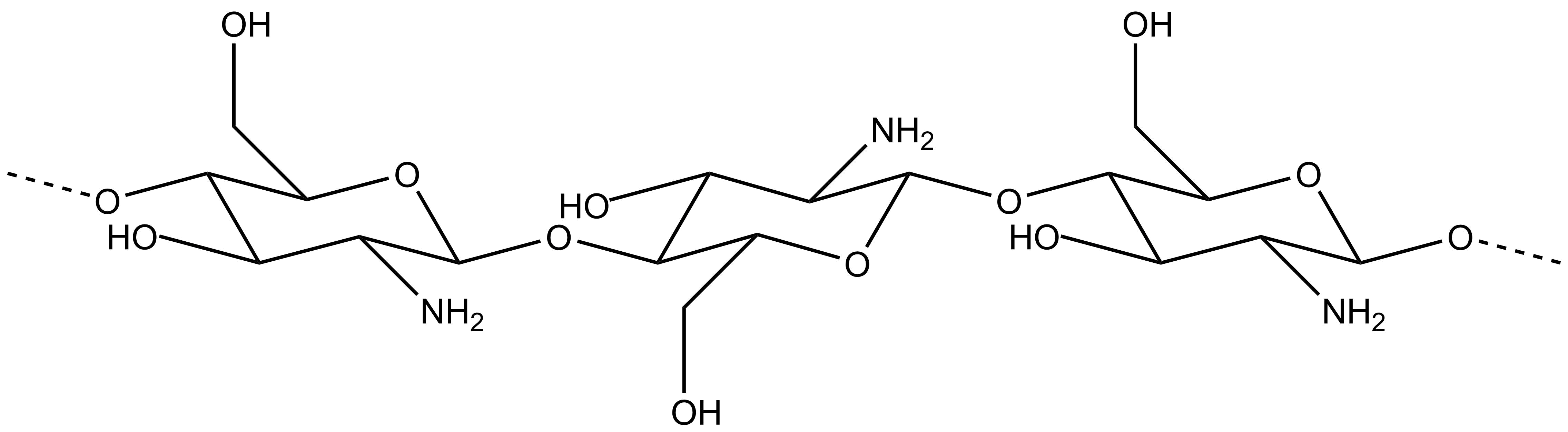
Biopolymers can be extracted from living organisms. We use these extracted biopolymers in our everyday lives. *e.g.* Alginic acid (from seaweed) is used as a thickener in ice creams and is sometimes listed as E400 on ingredients lists.

Many biopolymers are polysaccharides, meaning they are made up of lots of sugar units. The sugar unit is a 6-membered ring, containing 5 carbon atoms and 1 oxygen. Different polysaccharides can have different functional groups on their sugar units. These give them unique properties. Label the different functional groups on the following biopolymers.



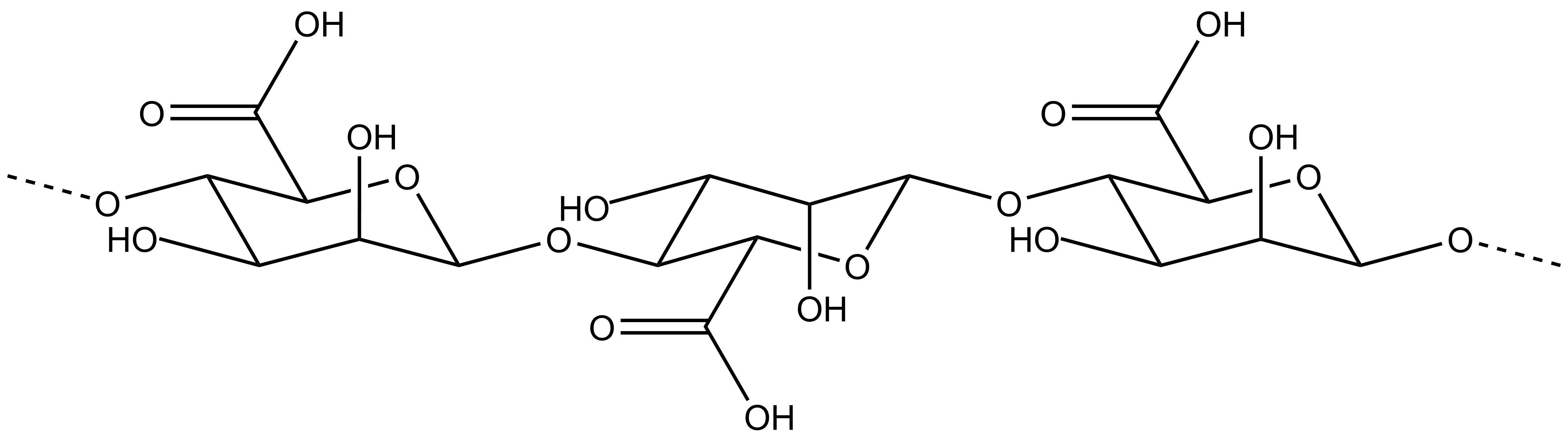
Alcohol

Cellulose (from plants)



Amine

Chitosan (extracted from the shells of crustaceans, *e.g.* crabs and lobsters)



Carboxylic acid

Alginic acid (extracted from seaweeds)