New Process for Selective Polysaccharide Derivative Oxidation

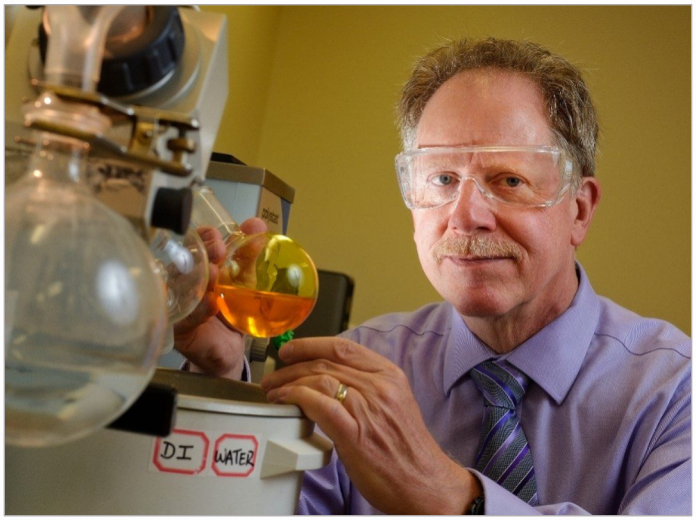
VTIP 18-071: "Oxidized Polysaccharides for Biomedical Applications"

THE CHALLENGE

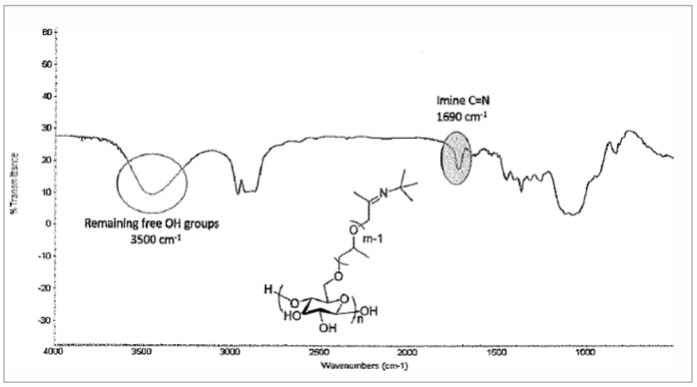
Current aqueous solubility and controllable release are essential for bioactive compounds. In the case of oral drug delivery, poor aqueous solubility of a drug can lead to low bioavailability. For poorly bioavailable drugs, higher doses are required to achieve a therapeutic concentration in systemic circulation. This can in turn have negative consequences for the patient, like higher drug costs and increased side effects. Therefore improvements in aqueous solubility and controllable release can lead to oral drug delivery with improved efficacy.

OUR SOLUTION

Kevin Edgar and his team have developed a new process for selective oxidation of secondary alcohol on polysaccharide derivatives, in particular olig(hydroxypropyl)-substituted polysaccharides based on polysaccharides like cellulose or dextran. Products have ketone moieties at the termini of the oligo (hydroxypropyl) side chains. These ketone moieties will permit formation of polymers loaded with active moieties (including for crop protection, drug delivery, nutraceuticals, and other bioactives) that can be released with control over timing and location. Selective oxidation of polysaccharide derivatives can afford new materials with tremendous potential in fields as diverse as drug delivery, biodegradable polymers, degradable hydrogels, and many other applications.



Lead inventor Kevin Edgar pictured in the lab.



FTIR spectrum of Ox-HPC-t-butylamine.

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