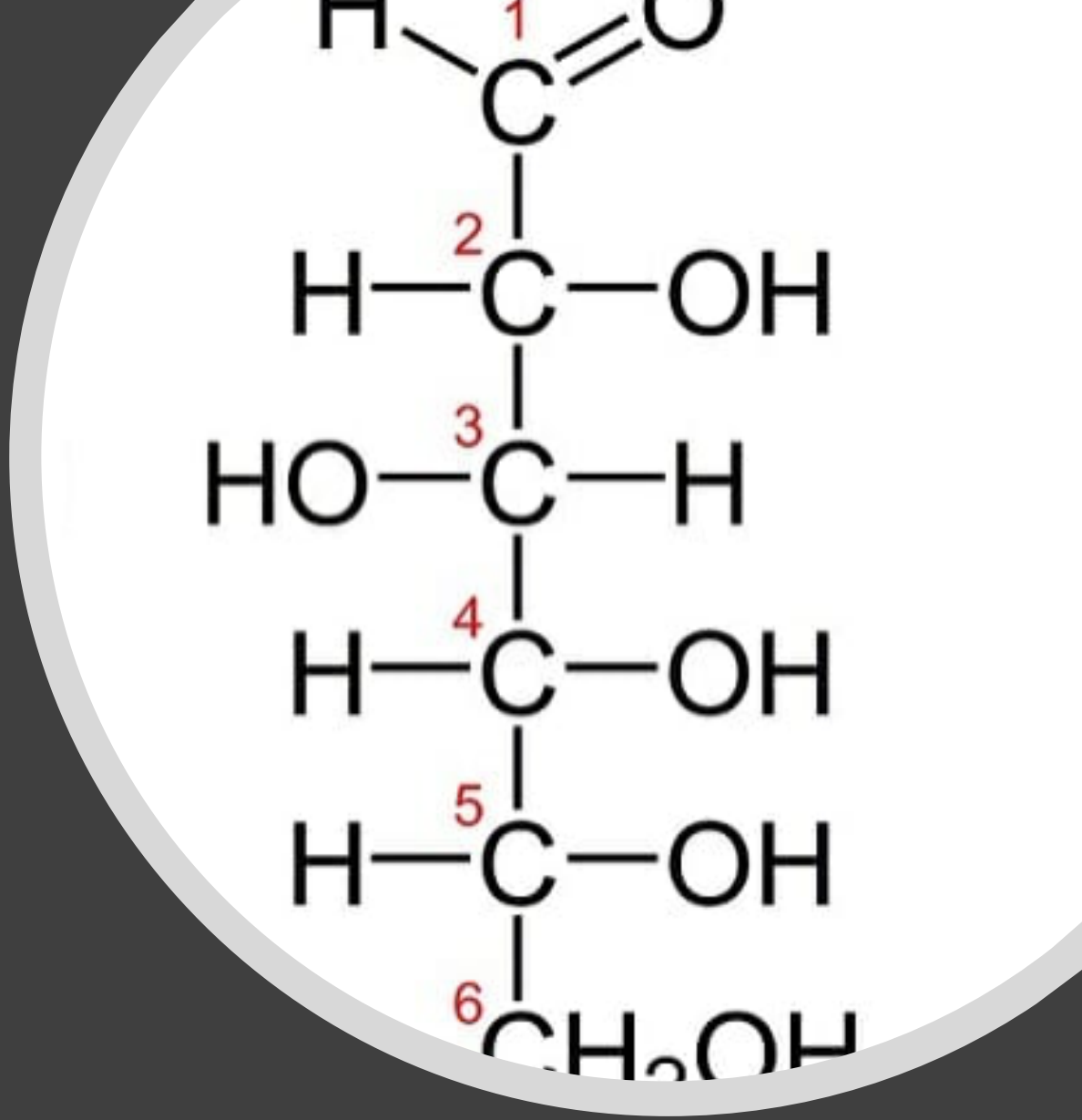
What does the enzyme PNGAse F remove?

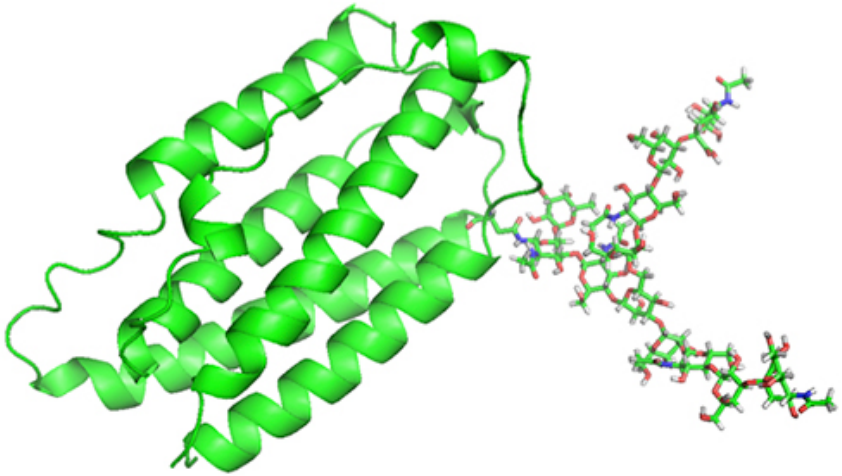
a) O-glycans
b) N-glycans
c) Glycosaminoglycans
d) Sialic acids
e) Fucose

Which monosaccharide is the C4 epimer of glucose?

a) Mannose
b) Furanose
c) Galactose
d) Xylose
e) Sialic acid

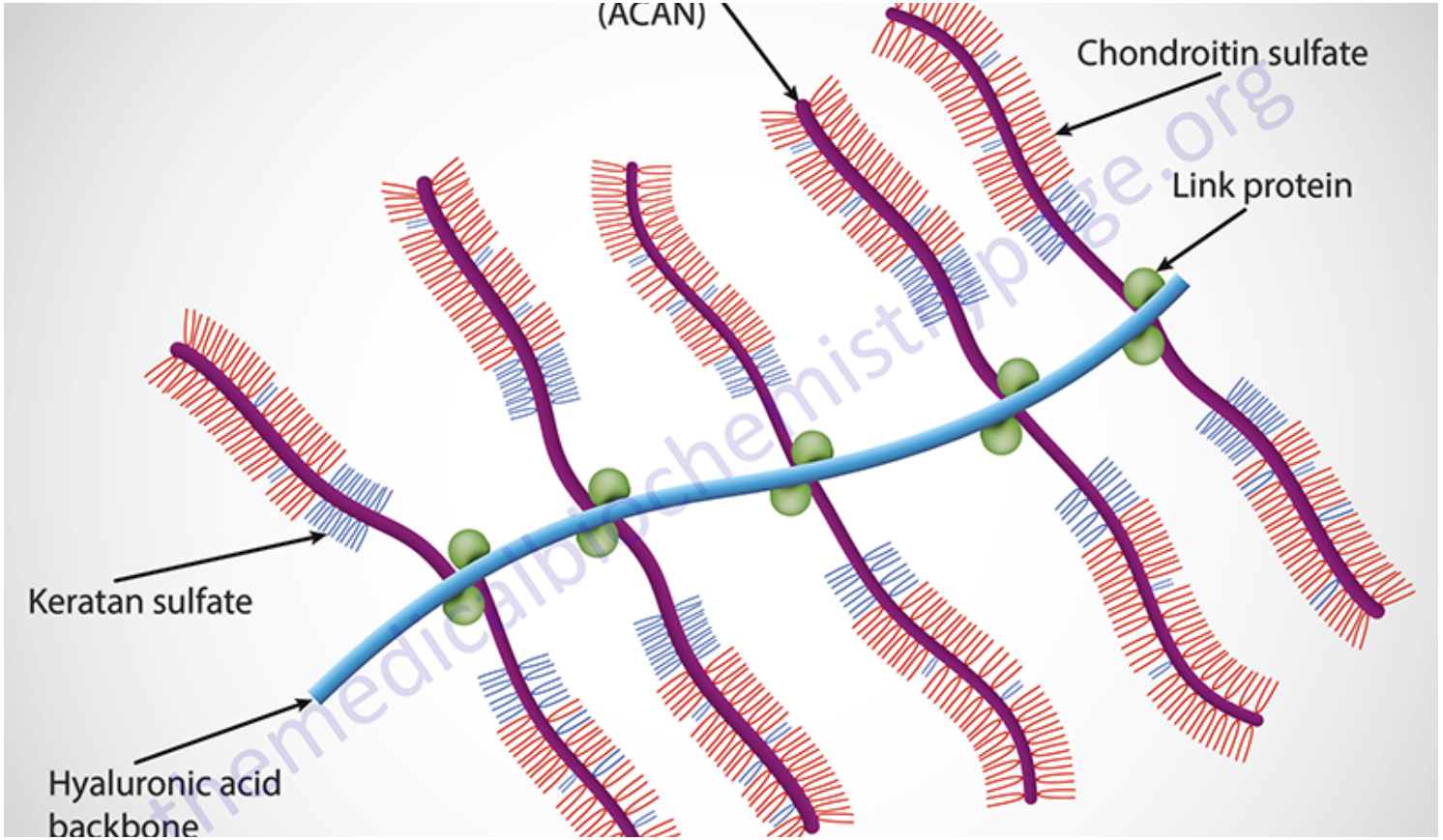


GLYCOPROTEIN



N-linked glycoproteins are glycan conjugates formed with which amino acid?

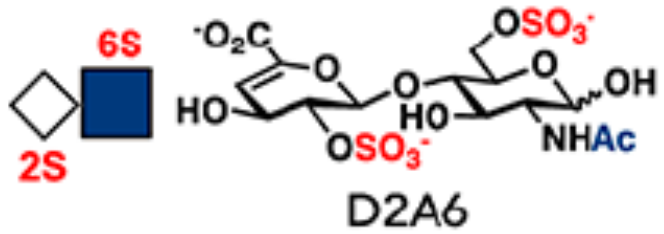
a) Asparagine (Asn)
b) Alanine (Ala)
c) Serine (Ser)
d) Lysine (Lys)
e) Tyrosine (Tyr)



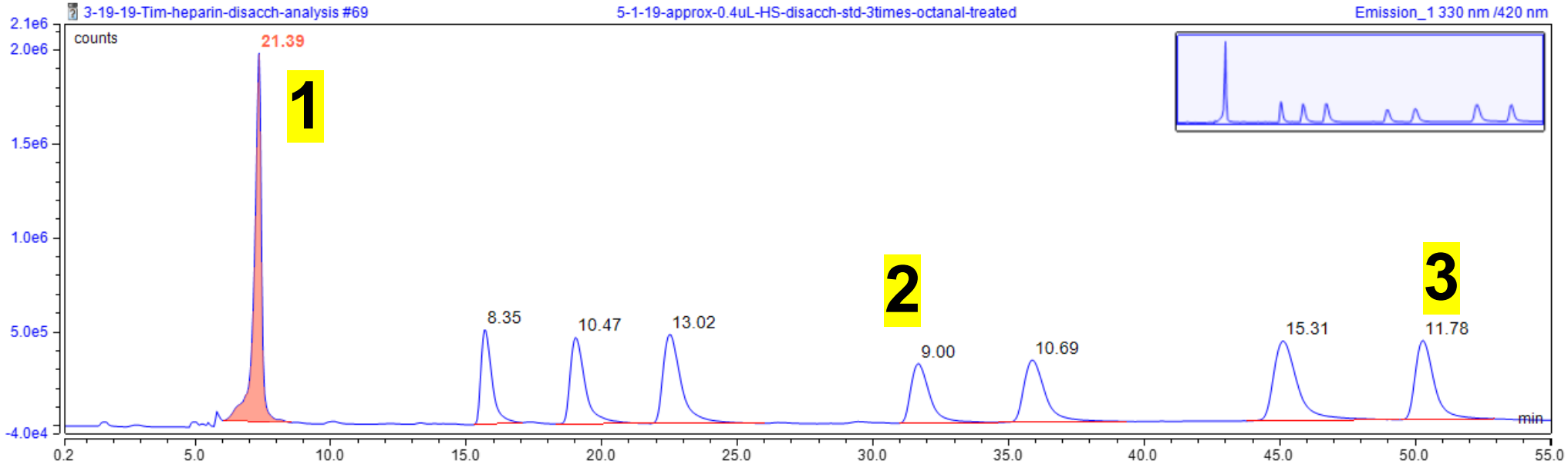
What is the tetrasacchide core structure for any proteoglycan?

a) Xyl-Gal-Gal-GlcA
b) Gal-Xyl-Glc-Gal
c) Xyl-Glc-Gal-Gal
d) Glc-Glc-Glc-Glc
e) Xyl-Xyl-Xyl-Xyl

Which peak corresponds to this disaccharide?

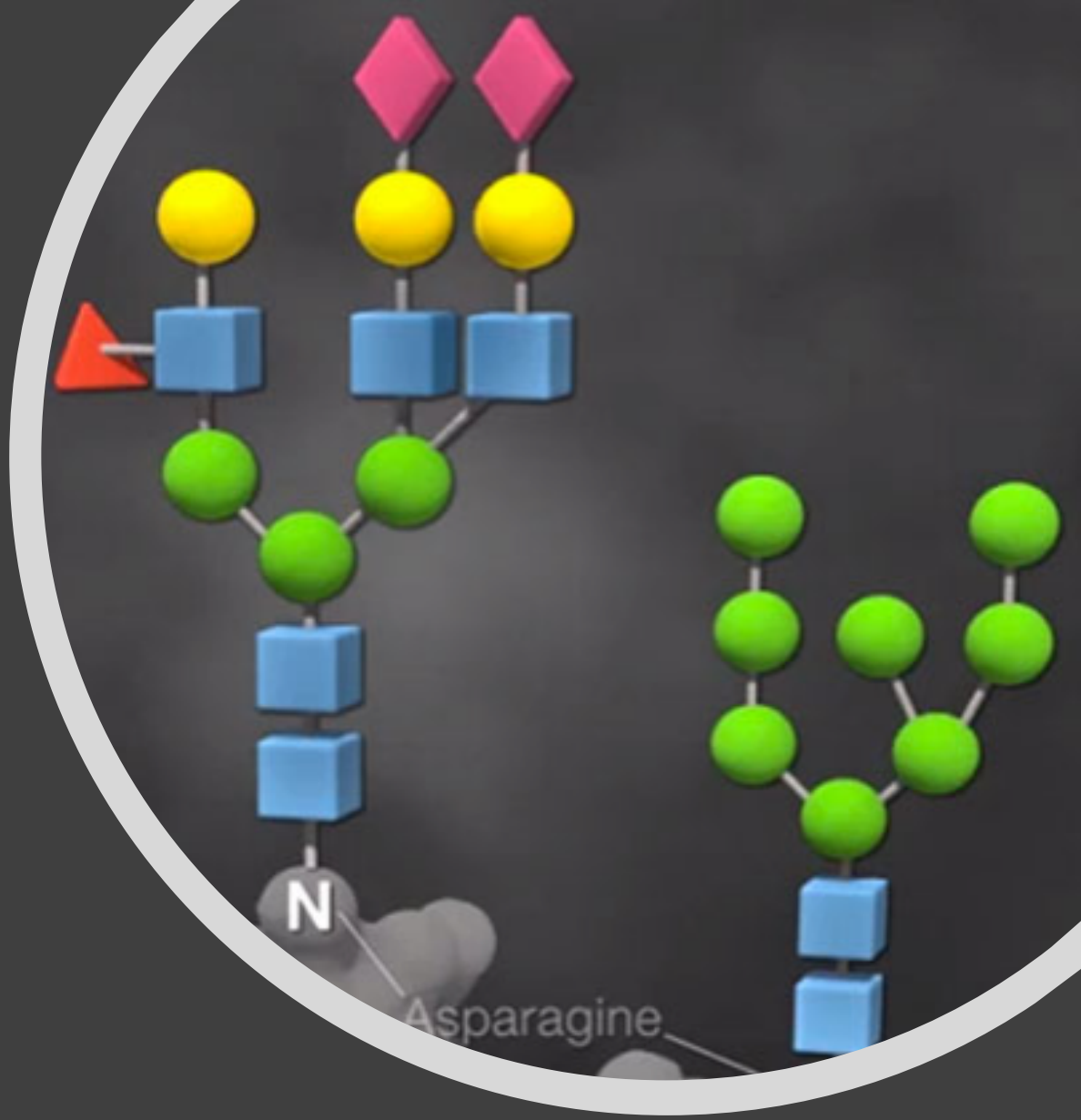


D2A6



Which chemical inhibitor(s) can be used to reduce *N*-glycosylation?

a) 10E4
b) swainsonine
c) kifunensine
d) tunicamycin
e) brefeldin

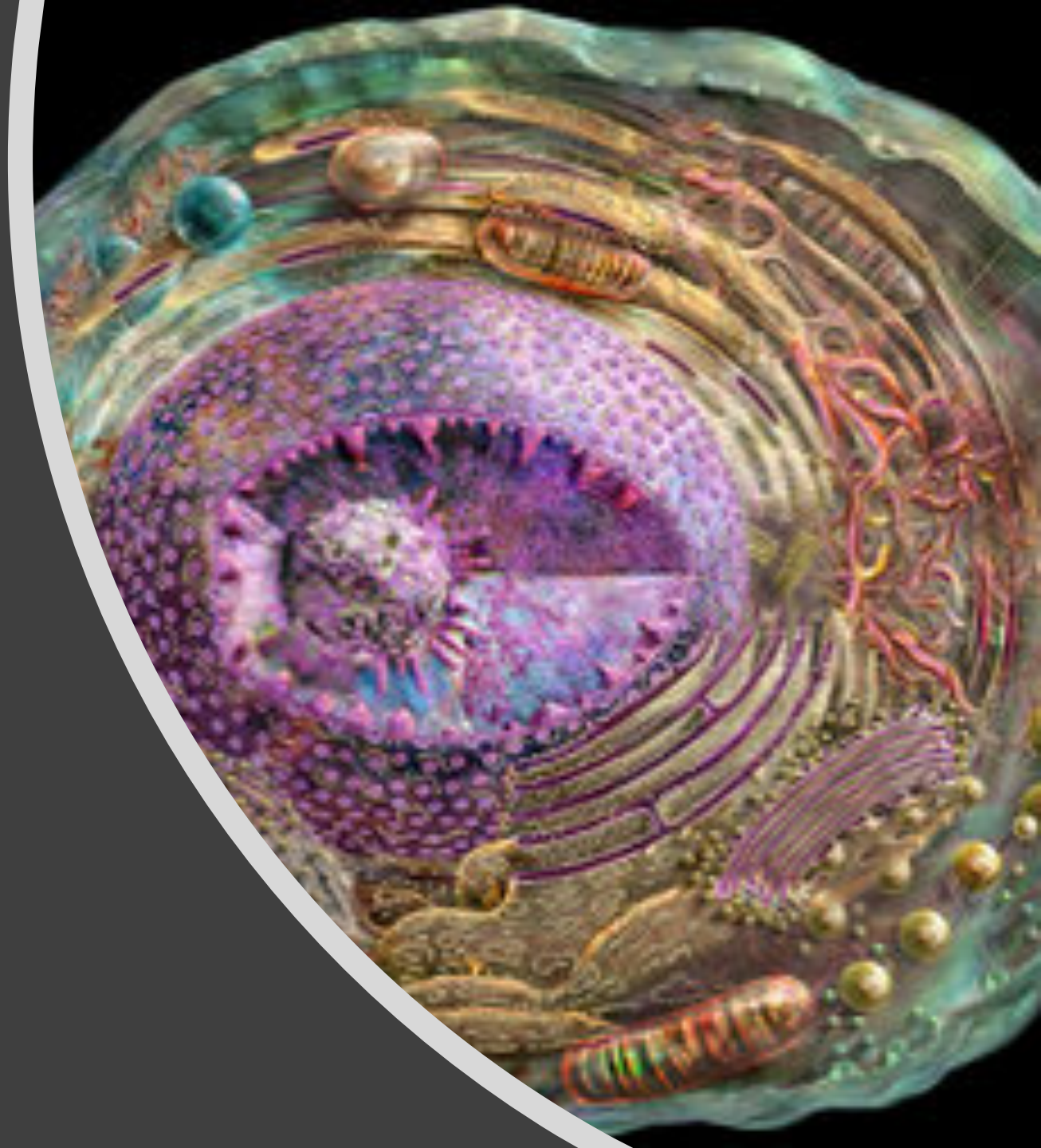


What does the lab of Toin van Kuppevelt do? Why is he famous in the glycoworld?

a. Discovered functions of proteoglycans
b. He is not famous
c. Discovered *N*-linked glycosylation
d. Developed antibody for O-glycans
e. Developed HS pattern specific antibodies

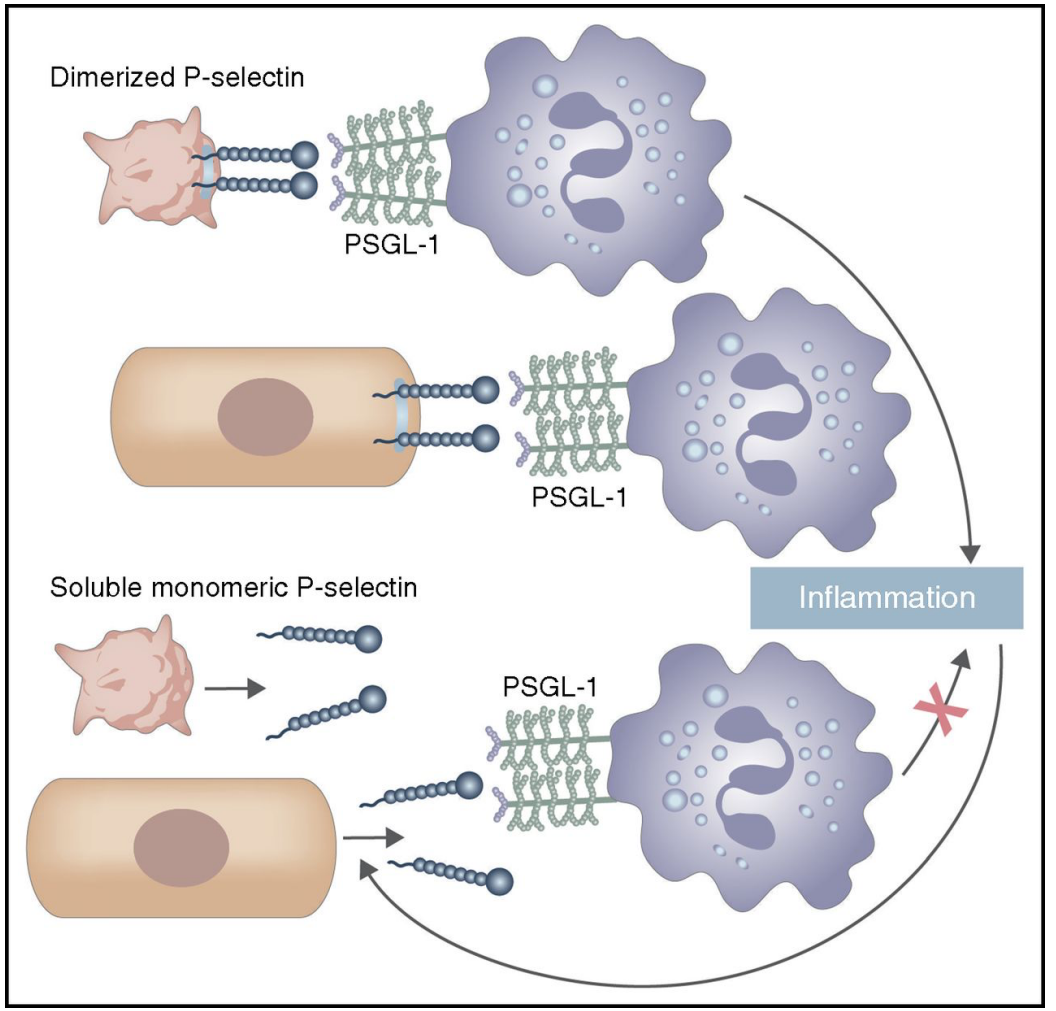
Where can you find glycosylation?

a) Cell surface (glycocalyx)
b) Nucleus
c) Extracellular matrix
d) Golgi apparatus
e) Endosomes



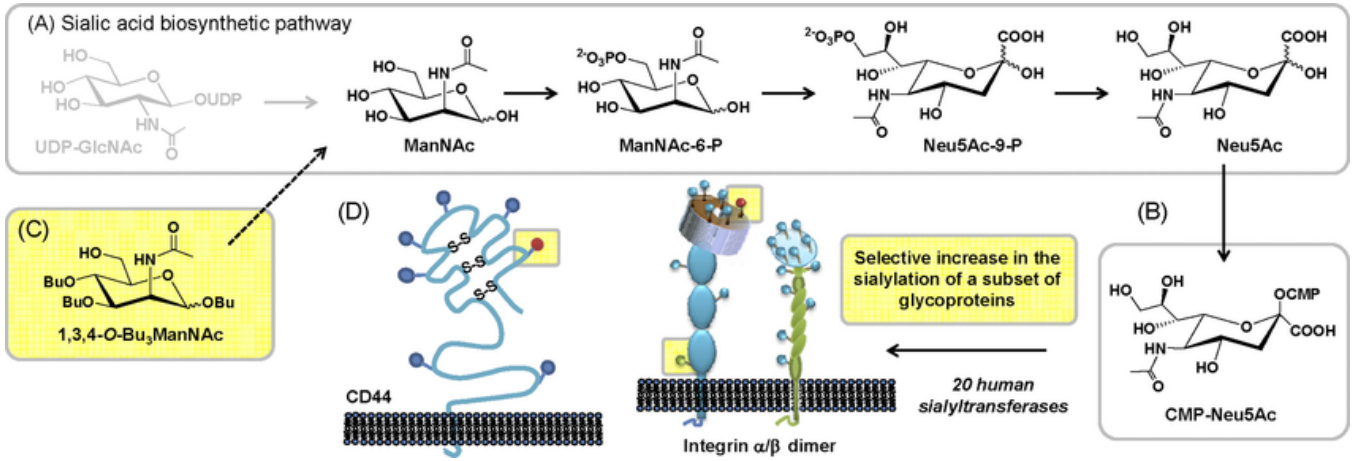
What are the requirements for P-selectin binding to PSGL-1 (P-selectin glycan ligand-1)?

a. SSEA-1
b. Tyrosine Sulfation
c. Sialyl—Lewis X
d. Fucosylation
e. N-glycosyation



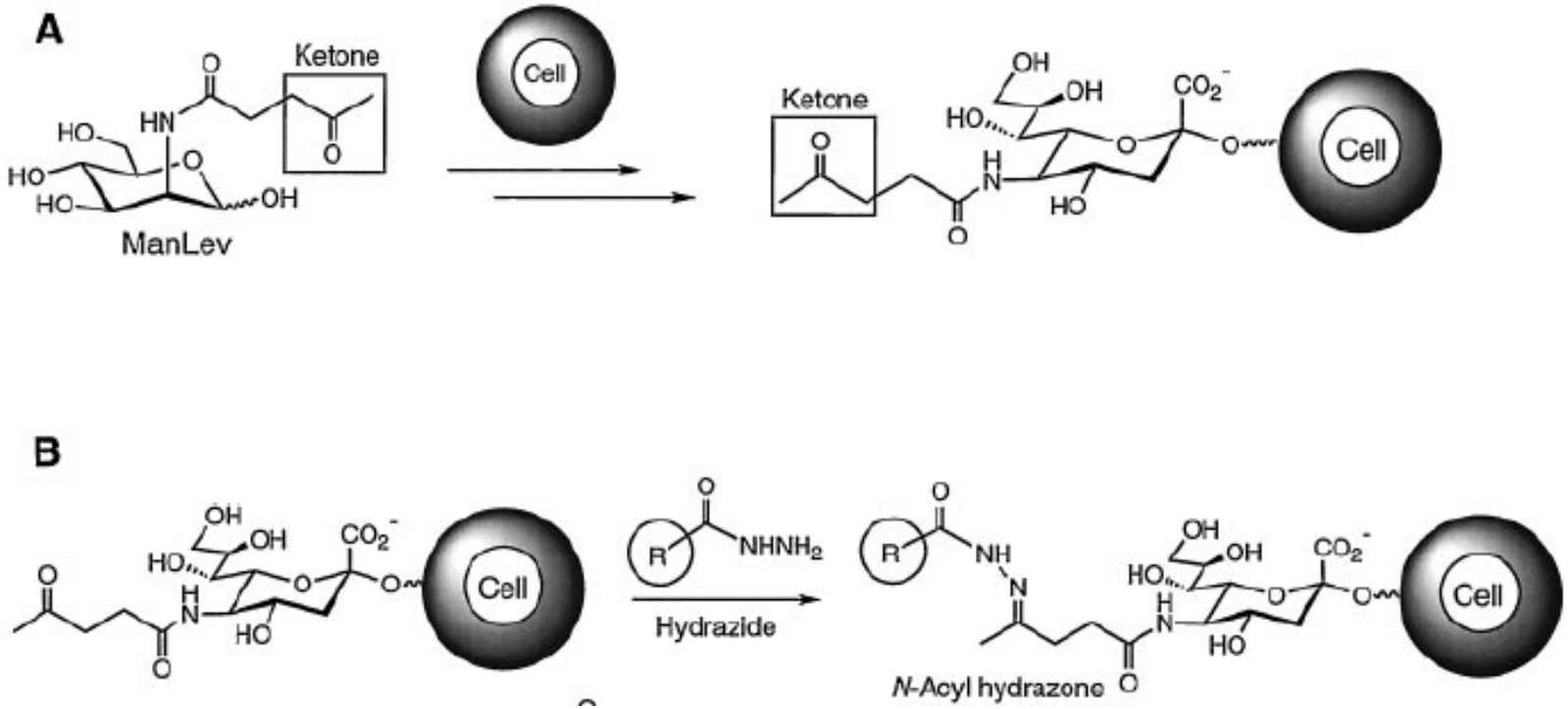
Monosaccharides often interconvert inside the cell to other monosaccharides. If you incubate cells with N-acetylated mannose (ManNAc), what monosaccharide does it convert to?

a. Glucose
b. Fucose
c. Sialic acid
d. Xylose
e. Arabinose



Metabolic Flux Increases Glycoprotein Sialylation: Implications for Cell Adhesion and Cancer Metastasis
•March 2012
•Molecular & Cellular Proteomics 11(7):M112.017558
•DOI:
•10.1074/mcp.M112.017558

Who pioneered this approach and what is it called?



a. Bertozzi
b. Mahal
c. Kiessling
d. Whitesides
e. Huang

Science

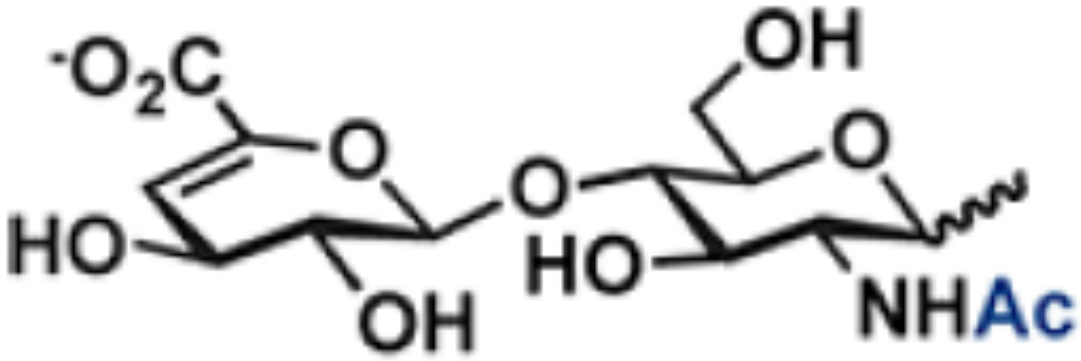
Engineering Chemical Reactivity on Cell Surfaces Through Oligosaccharide Biosynthesis

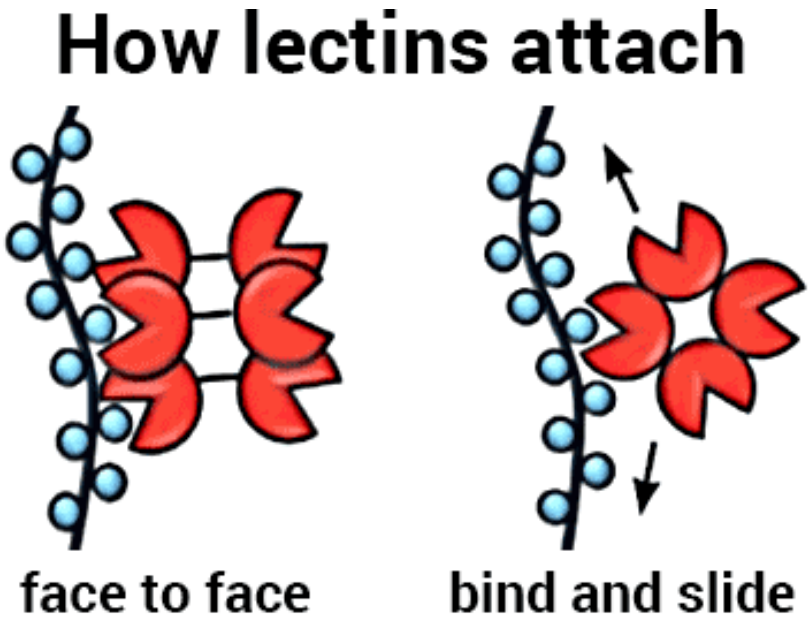
Lara K. Mahal, Kevin J. Yarema and Carolyn R. Bertozzi

Science **276** (5315), 1125-1128.
DOI: 10.1126/science.276.5315.1125

Name this disaccharide

a. D2A6
b. D2A0
c. D0A0
d. D2S6
e. Hep-I-A





Which lectin would you use to detect 6’-sialoglycans?

a) PHA
b) MAA
c) SNA
d) Streptavidin
e) LTL

In my JACS 2014 paper, which glycopolymers bound FGF2 and activated Erk signaling to allow mouse embryonic stem cells to differentiate

Communication
pubs.acs.org/JACS
Open Access on 07/14/2015

Glycocalyx Remodeling with Proteoglycan Mimetics Promotes Neural Specification in Embryonic Stem Cells

Mia L. Huang,† Raymond A. A. Smith,† Greg W. Trieger, and Kamil Godula*

Department of Chemistry and Biochemistry, University of California, San Diego, California 92093-0358, United States

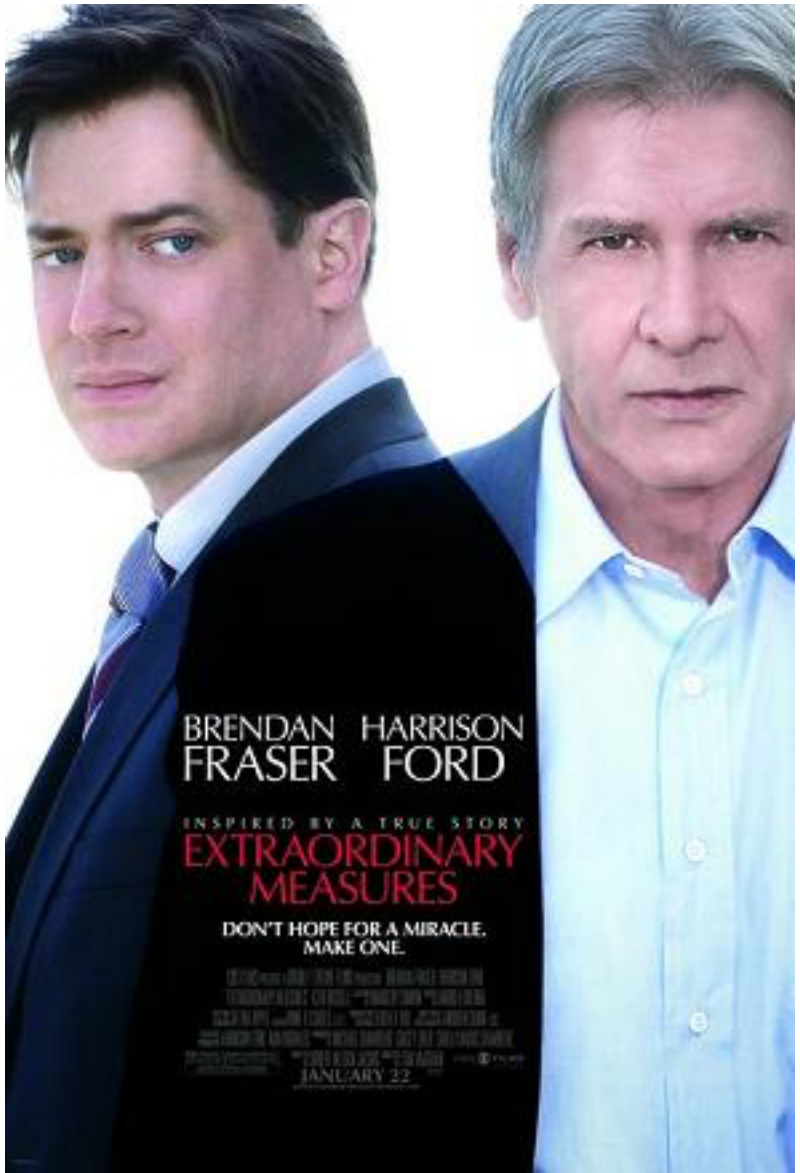
a. D0A0
b. D2A0
c. D2A6
d. GlcNAc6S
e. none

Which font should you never use in a professional setting?

a. Arial
b. Avenir
c. Algerian
d. Cooper
e. Comic sans

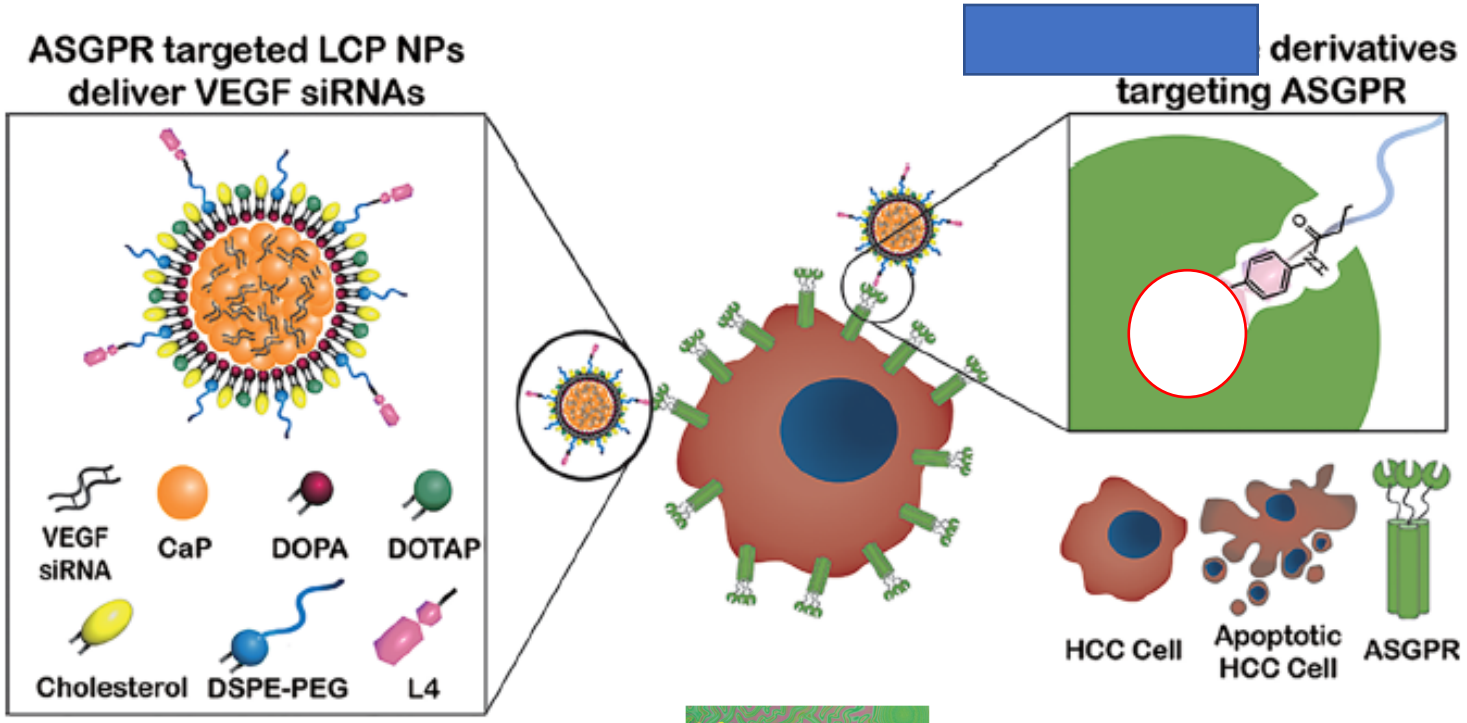
Which of these diseases is *directly* glycosylation related?

a. NGLY1
b. Pompe disease
c. AIDS
d. Yellow Fever
e. Ulcerative Colitis



If you were to design a molecule to target it to the liver? Which monosaccharide would you append to your molecule

a. Sialic acid
b. Xylose
c. Nothing
d. Galactose
e. Fructose



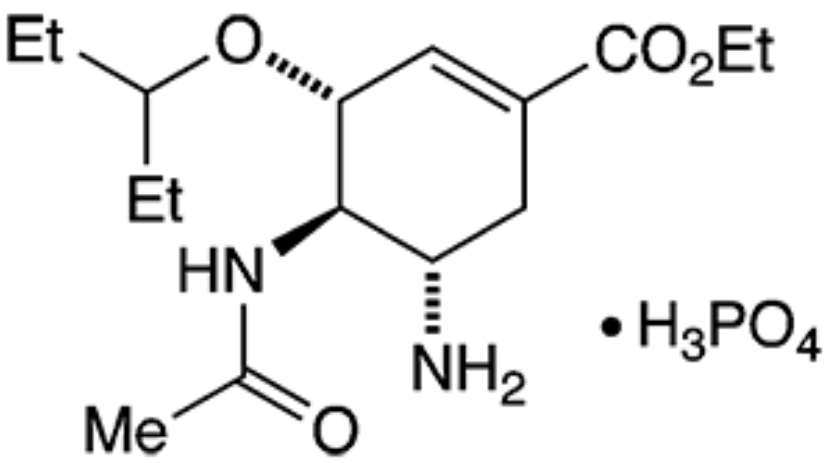
BioMACROMOLECULES
Article
Cite This: Biomacromolecules 2018, 19, 2330−2339
pubs.acs.org/Biomac

[redacted] Derivative-Modified Nanoparticles for Efficient siRNA Delivery to Hepatocellular Carcinoma

Kuan-Wei Huang,[†,‡] Yu-Tsung Lai,[†,§] Guann-Jen Chern,[‡] Shao-Feng Huang,[§] Chia-Lung Tsai,[§] Yun-Chieh Sung,[‡,∥] Cheng-Chin Chiang,[‡] Pi-Bei Hwang,[‡] Ting-Lun Ho,[‡] Rui-Lin Huang,[‡] Ting-Yun Shiue,[⊥] Yunching Chen,[*,‡,∥] and Sheng-Kai Wang[*,§,∥]

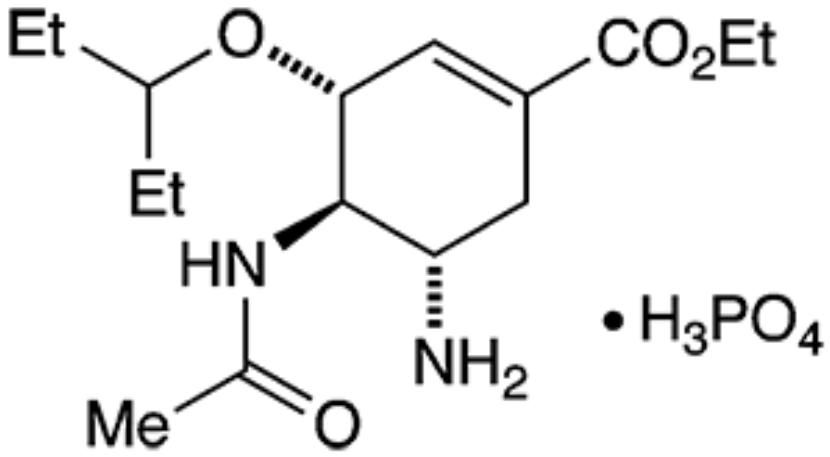
What disease does this molecule aid?

a. Lung fibrosis
b. Amoeboisis
c. AIDS
d. Yellow Fever
e. Influenza Flu



What happens when you consume oseltamivir?

a. Nothing
b. Converts to amide
c. Converts to ester
d. Converts to carboxylate
e. Converts to ether

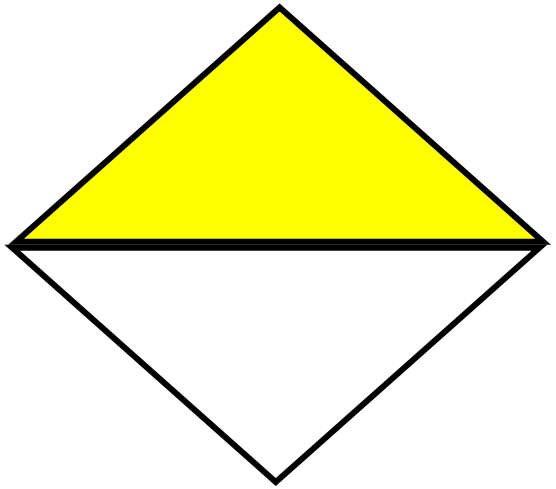


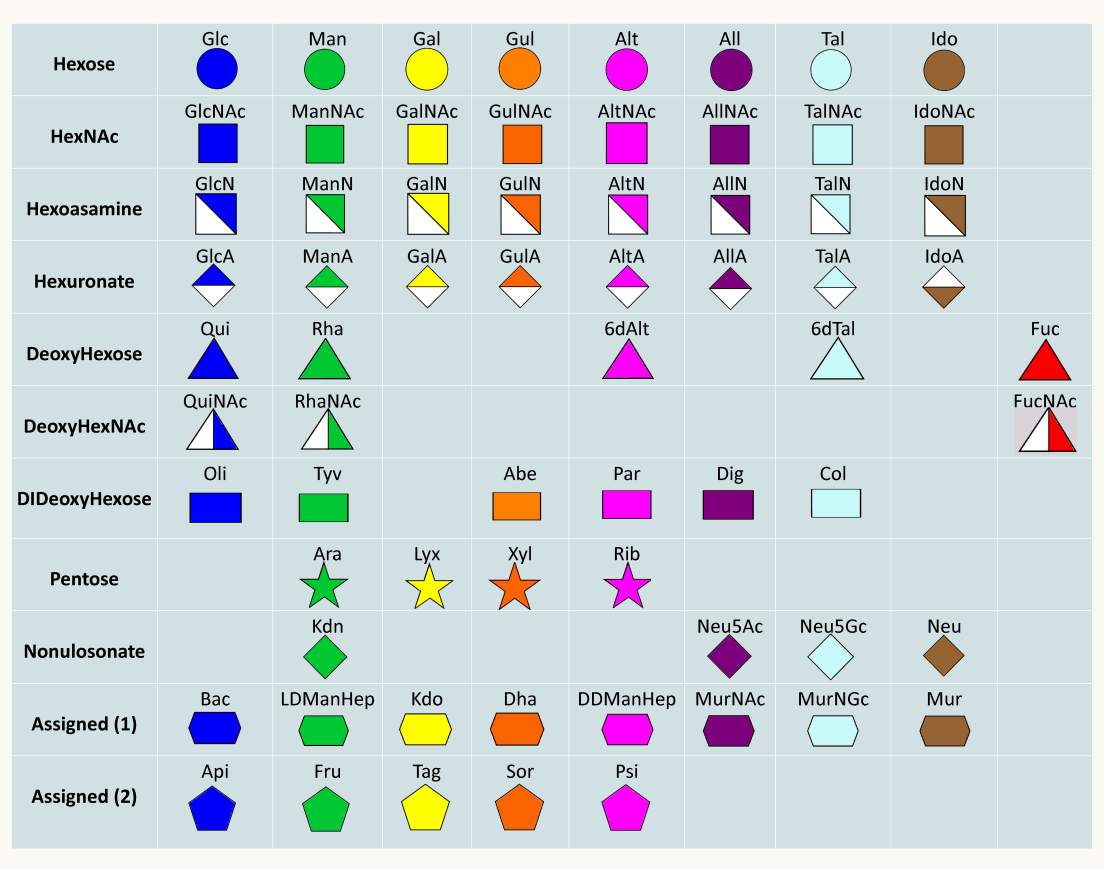
Lectins, such as SNA and MAA, often require the presence of which ions for binding?

a. Mg
b. Na
c. Ca
d. Mn
e. Zn

What is this monosaccharide?

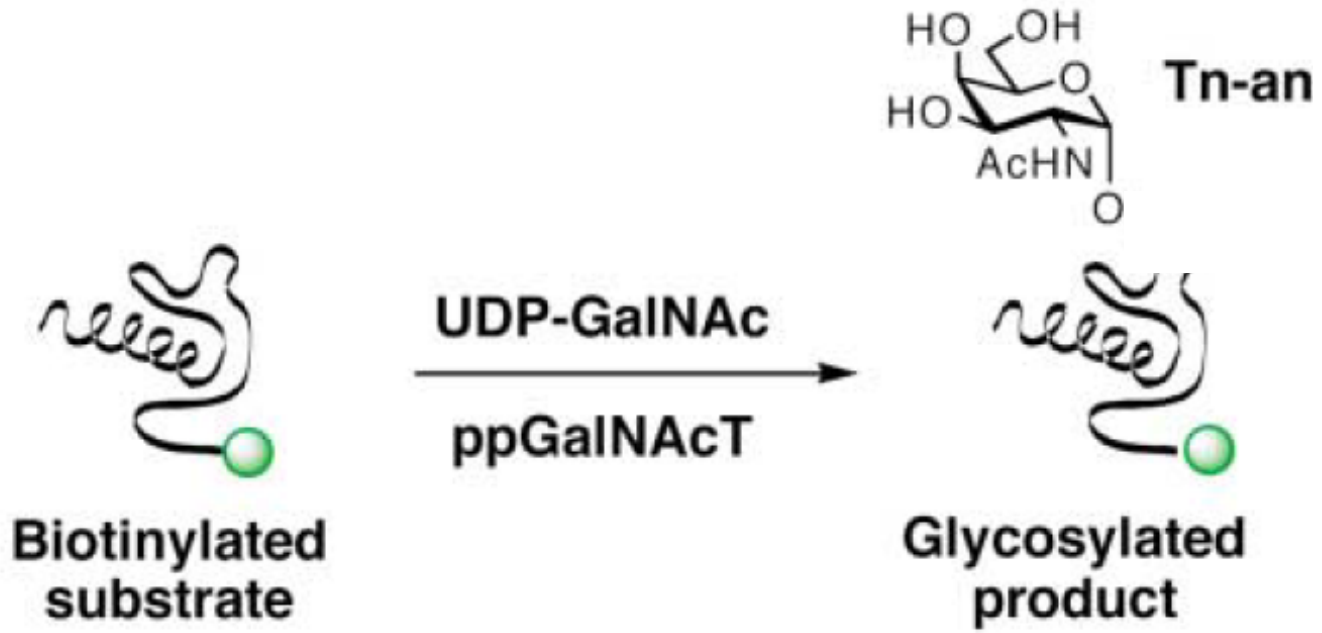
a. Pentose
b. Ara
c. GalA
d. GlcA
e. IdoA





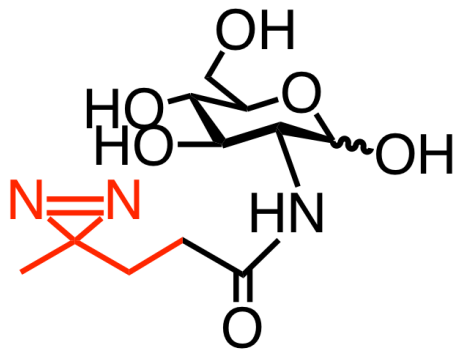
Which enzyme is responsible for initiating O-GalNAc glycosylation?

a. GlcE
b. b4GalT7
c. b4GalT1
d. GlcNAcT
e. ppGalNAcT

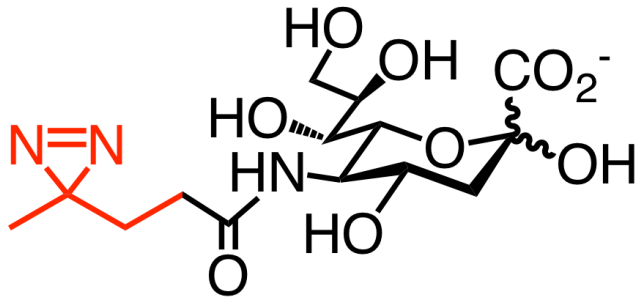


Whose lab pioneered the use of these sugars?

a. Godula @ UCSD
b. Bertozzi @ Stanford
c. Kohler @ UTSW
d. Esko @ UCSD
e. Schultz @ Scripps



GlcNDAz



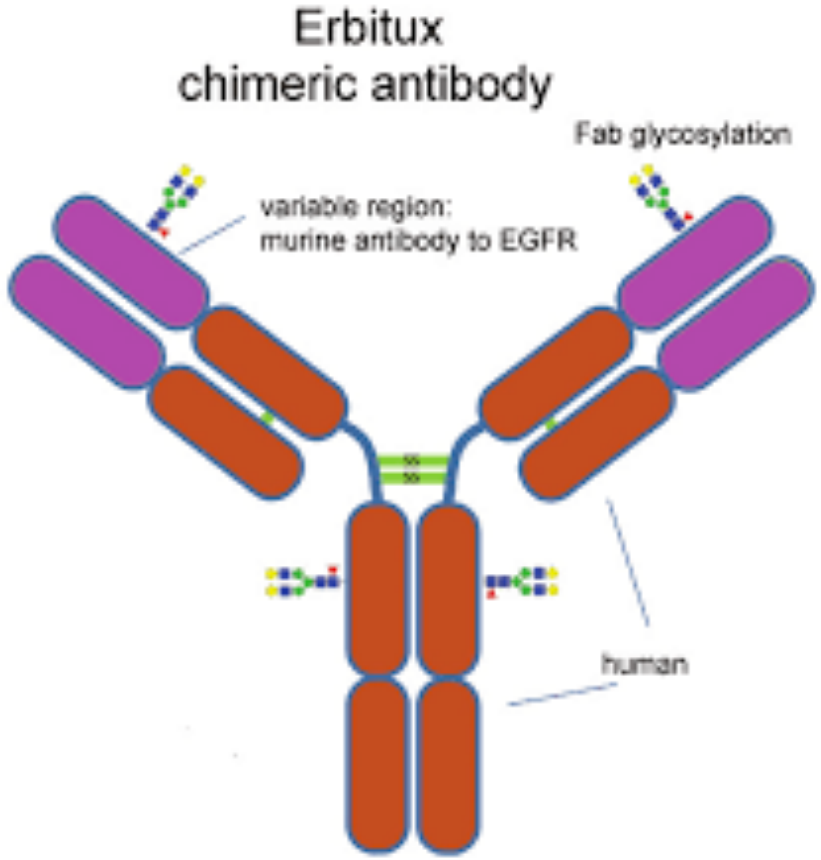
SiaDAz

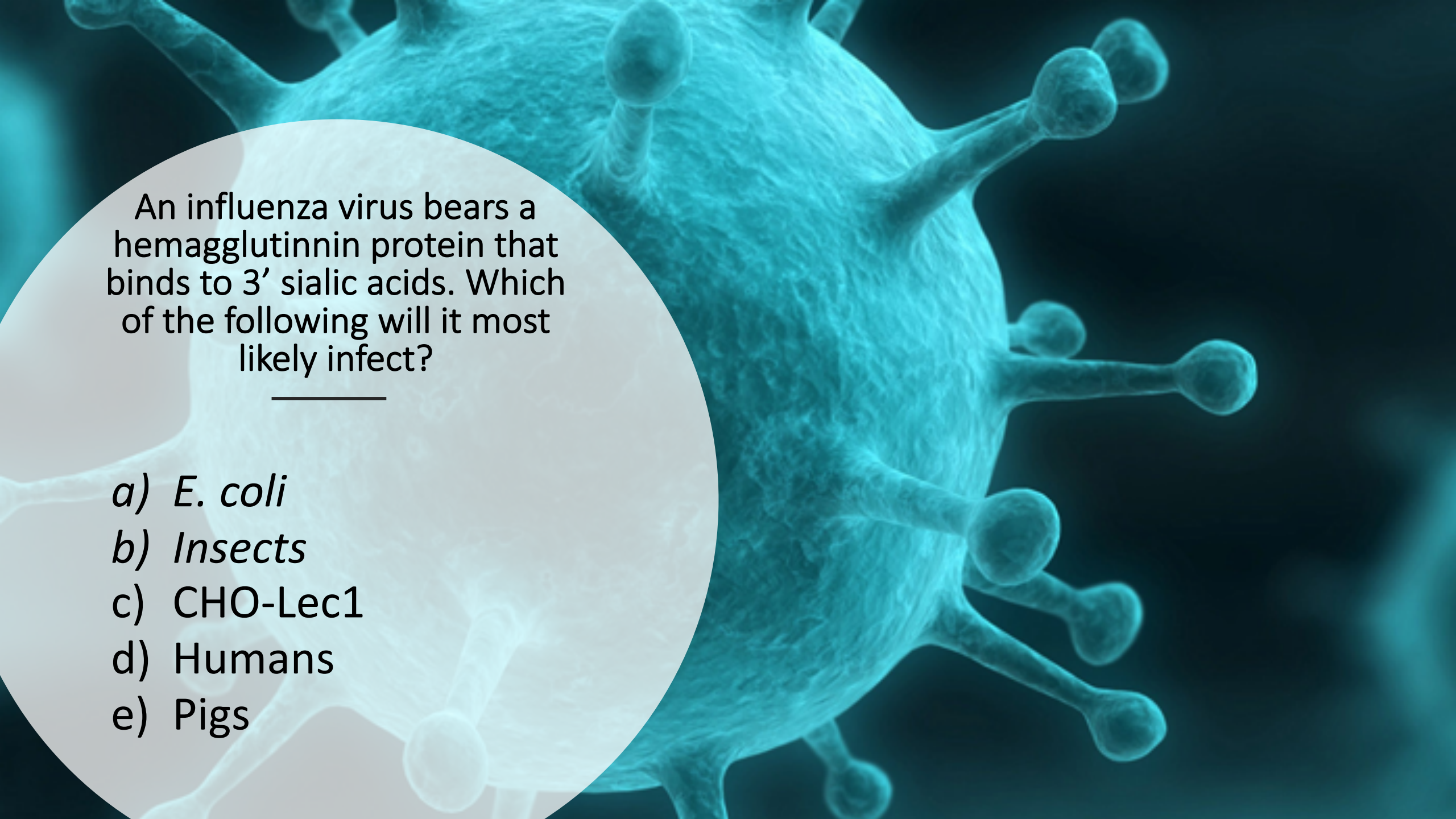
Which strategy would you use to enrich glycopeptides from peptides?

a) Reversed-phase HPLC
b) Normal phase HPLC
c) HILIC HPLC
d) Anion exchange HPLC
e) Cation exchange HPLC

Which glycosylation on an antibody *N*-glycan has been shown to be inhibit ADCC?

a. Core fucosylation
b. Sialylation
c. Galactosylation
d. Core Mannosylation
e. Core glucosylation





An influenza virus bears a hemagglutinnin protein that binds to 3’ sialic acids. Which of the following will it most likely infect?

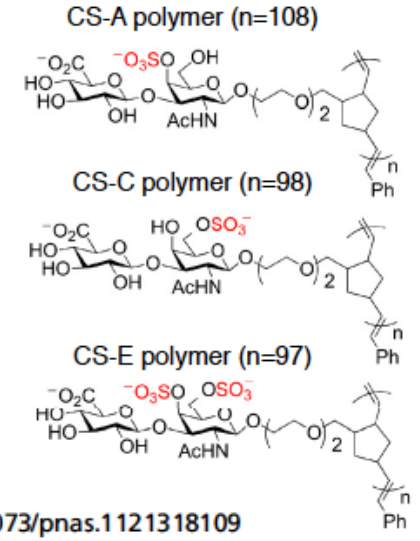
a) *E. coli*
b) *Insects*
c) CHO-Lec1
d) Humans
e) Pigs

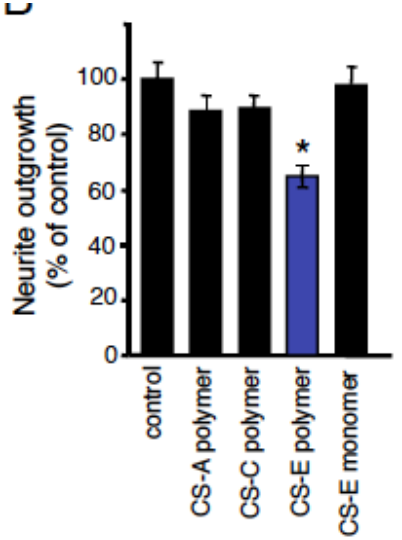
What happens to axonal growth when you add a chondroitin-sulfate E glycopolymer?

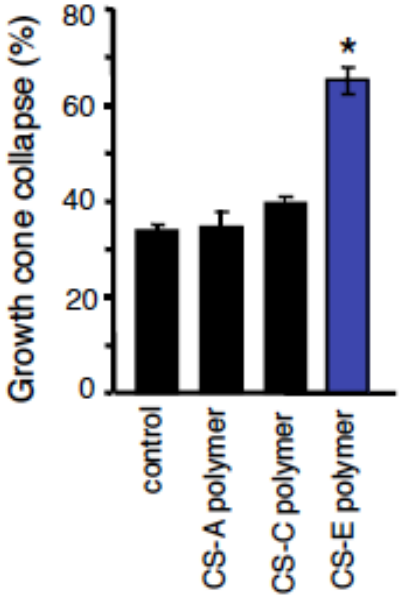
a. *Nothing*
b. *Increases*
c. *Reduces*

A sulfated carbohydrate epitope inhibits axon regeneration after injury

Joshua M. Brown[a,1], Jiang Xia[a,1], BinQuan Zhuang[a], Kin-Sang Cho[b], Claude J. Rogers[a], Cristal I. Gama[a], Manish Rawat[a], Sarah E. Tully[a], Noriko Uetani[c], Daniel E. Mason[d], Michel L. Tremblay[c], Eric C. Peters[d], Osami Habuchi[e], Dong F. Chen[b,f], and Linda C. Hsieh-Wilson[a,2]







www.pnas.org/cgi/doi/10.1073/pnas.1121318109

What was the lethal substance that contaminated heparin injections in 2008? 81 people died, ~300 injured

a. HS
b. DS
c. KS
d. CS
e. trypsin

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The New York Times

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HEALTH

Drug Tied to China Had Contaminant, F.D.A. Says

By GARDINER HARRIS and WALT BOGDANICH MARCH 6, 2008

WASHINGTON — Federal drug regulators said Wednesday that a critical blood thinner that had been linked to at least 19 deaths and whose raw components were produced in China contained a possibly counterfeit ingredient that mimicked the real drug.

Routine tests failed to distinguish the contaminant from the drug, heparin. Only sophisticated magnetic resonance imaging tests uncovered that as much as 20 percent of the product's active ingredient was a heparin mimic blended in with the real thing. Federal officials said they did not know what the contaminant was.

"At this point, we do not know whether the introduction was accidental or whether it was deliberate," said the Food and Drug Administration's deputy commissioner, Dr. Janet Woodcock.

Heparin is made from pig intestines. Scientific Protein Laboratories, based in Waunakee, Wis., bought raw heparin produced in some cases in small, unregulated family workshops in China and processed it in plants in Wisconsin and China, according to heparin traders and producers in China. Baxter International purchased the active ingredient from Scientific Protein

RELATE

Nat Prod Rep. 2009 March ; 26(3): 313–321. doi:10.1039/b819896a.

Lessons learned from the contamination of heparin

Haiying Liu[a], **Zhenqing Zhang**[a], and **Robert J. Linhardt**[a,b,c]
Robert J. Linhardt: Linhar@rpi.edu