

## Lipopolysaccharide

Consult the diagram of *E. coli* K-12 lipopolysaccharide on the reverse. Within this structure, find and circle the group mentioned, or answer the question:

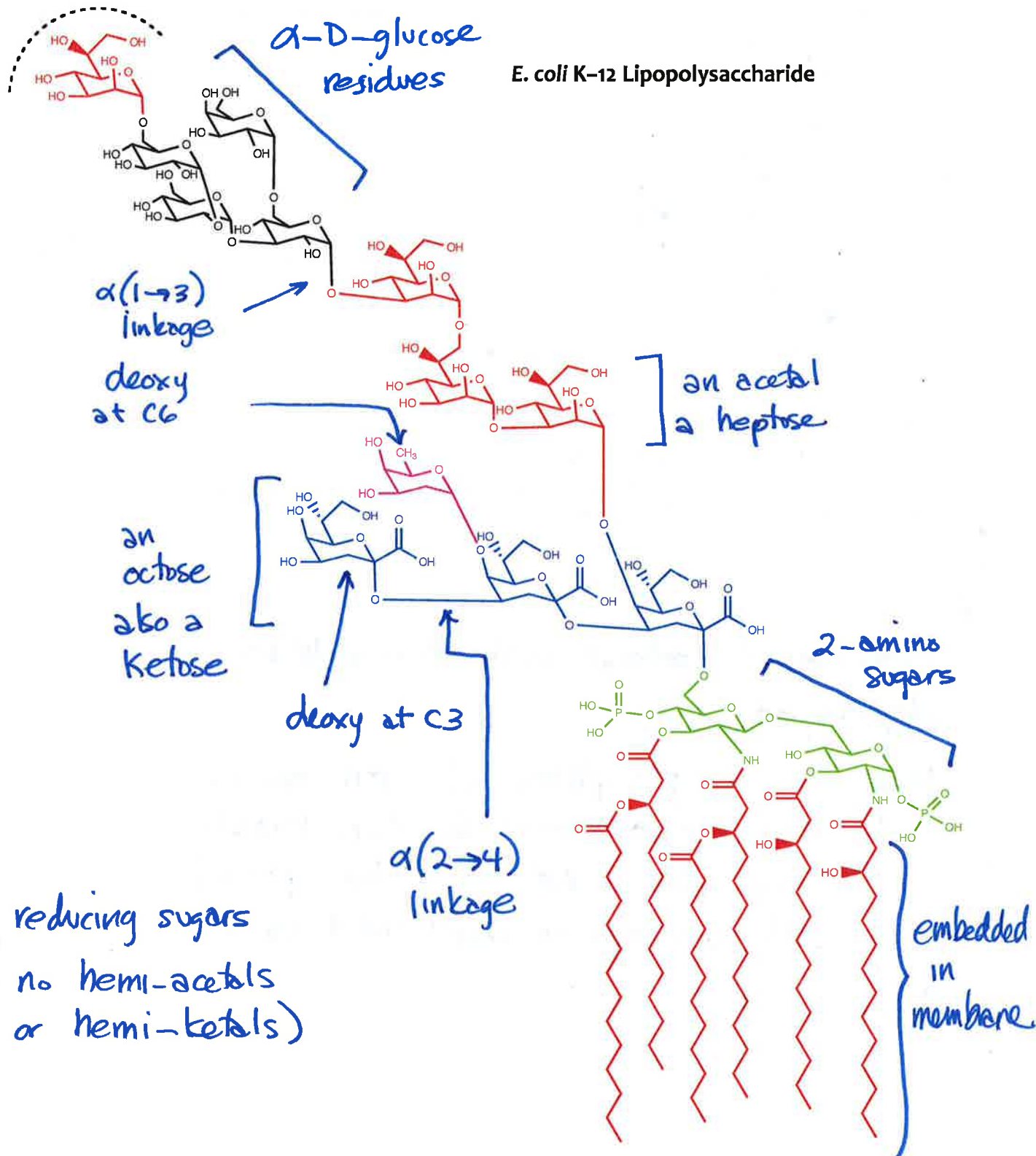
1. an octose ✓
2. a heptose ✓
3. a ketose ✓
4. two deoxy sugars ✓
5. a pair of sugars linked 2 → 4 ✓
6. a pair of sugars linked 1 → 3 ✓
7. an amino sugar ✓
8. an acetal ✓
9.  $\alpha$ -D-glucose (as if it were not part of the structure) ✓
10. any oxidized sugars
11. any reducing sugars **None**
12. What is the charge on this molecule at physiological pH?
13. Which part of this molecule would be expected to dissolve in a lipid bilayer? Explain specifically why— what are the structural features that make this possible?

There are 3 carboxylic acids which would be deprotonated.

There are 2 phosphates w/ 2 OH each.  
At least one each would be deprotonated.  
The 2nd pKa is not too far from pH 7.4  
so let's count them as deprotonated as well.

Total: -7

**E. coli K-12 Lipopolysaccharide**



no reducing sugars  
(= no hemi-acetals or hemi-ketals)