The apparent configuration of this stereocenter is $R$, when viewing (improperly) the structure in the $20$ plane of the page. Instead, the molecule must explicitly be viewed so that the least important group is oriented away from the viewer.

If two groups on a tetrahedron are exchanged, the configuration is inverted.

*Swapping the positions of two substituents twice has the same effect on tetrahedral geometry as rotation.*

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**Carbohydrates** $\text{(-CH}_2\text{O)}_n$

By definition, any group written on the "backbone" (vertically) is oriented away from the view, while any group on the "arms" (horizontal) is oriented towards the viewer.

- **Glycerol**
- **D-glyceraldehyde**
Although the groups appear to be in the S configuration, the least important group is oriented towards the view, so that apparent configuration must be inverted (it's really R).

Improper rotation of a Fischer projection by 90° will cause inversion of configuration, due to the spatial definition of a Fischer projection.

For carbohydrates, C-20 is drawn at the top.
D-xylose

D-mannose