Table 4. Student assumptions underlying alternative student reasoning about the biological molecules.

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| **Student alternative assumptions** | **Example of alternative conceptions expressing these assumptions** |
| As goes macro, so goes micro | Fat molecules are round and bouncy.Protein molecules are strong. |
| Source = substance | Examples of fats are potato chips, bacon, and butter.Starch contains sugar, so it should test positive for sugar. |
| Molecule/energy equivalence | Sugar is energy.Calories are a kind of fat.Plants get food from the sun. |
| Like acts upon like | DNA polymerase acts on DNA, so it is a nucleic acid.Amylase acts on starch, so it is a carbohydrate. |
| Functional equivalence | Sugars are fats (or contain fats) because they both contribute to weight gain.Protein is a kind of carbohydrate because it gives energy. |
| Functional limitation | Protein is needed only for energy and muscle building.Fat is needed only for energy. |