Primary Function: **Energy storage, membrane structure, signaling.**
Monomers: Glycerol and fatty acid (FA)

**Key point:** glycerol and FAs are linked by an ester bond

**Naming convention:** (# of Carbons : # of double bonds)

**Fatty Acid Structure**
Polar head and non-polar tail

<table>
<thead>
<tr>
<th>Saturated</th>
<th>Unsaturated</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Saturated Fatty Acid" /></td>
<td><img src="image2.png" alt="Unsaturated Fatty Acid" /></td>
</tr>
</tbody>
</table>

**Note:** FAs can be monounsaturated or polyunsaturated depending on the number of double bonds.

**Impact of fatty acid structure on physical properties:**

<table>
<thead>
<tr>
<th></th>
<th>Melting Point</th>
<th>Structure at Room Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Chain (more Carbon)</td>
<td>Higher</td>
<td>Solid</td>
</tr>
<tr>
<td>Short Chain (fewer Carbon)</td>
<td>Lower</td>
<td>Liquid</td>
</tr>
<tr>
<td>Saturated</td>
<td>Higher</td>
<td>Solid</td>
</tr>
<tr>
<td>Unsaturated</td>
<td>Lower</td>
<td>Liquid</td>
</tr>
</tbody>
</table>

**Vocab: Amphipathic**
Molecules with both polar and non-polar components, allowing for different environmental interactions. Ex. Phospholipids form bilayer membranes

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# Summary of Biologically Important Lipids

<table>
<thead>
<tr>
<th>Lipid Type</th>
<th>Structure</th>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phospholipid</td>
<td>Glycerol + 2 FA + Phosphate</td>
<td>Plasma membrane structure</td>
<td>Phosphatidylcholine</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>Glycerol + 3 FA</td>
<td>Energy Storage</td>
<td>Tristearin</td>
</tr>
<tr>
<td>Steroid</td>
<td>3 hexane rings + 1 pentane ring</td>
<td>Hormone synthesis and membrane fluidity</td>
<td><strong>Cholesterol</strong>&lt;br&gt;Regulates membrane fluidity:&lt;br&gt;More fluid at low temperatures&lt;br&gt;More solid at high temperatures</td>
</tr>
<tr>
<td>Eicosanoid</td>
<td>Modified 20 Carbon polyunsaturated FA</td>
<td>Signaling, primarily to trigger inflammatory response</td>
<td>Prostaglandins</td>
</tr>
<tr>
<td>Terpene</td>
<td>Isoprene units (CsHs)</td>
<td>Synthesis of sex hormones</td>
<td>Terpenoids</td>
</tr>
</tbody>
</table>