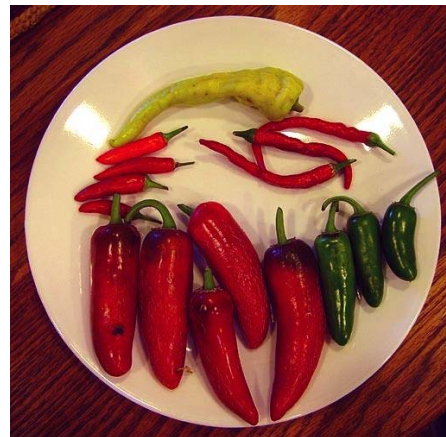
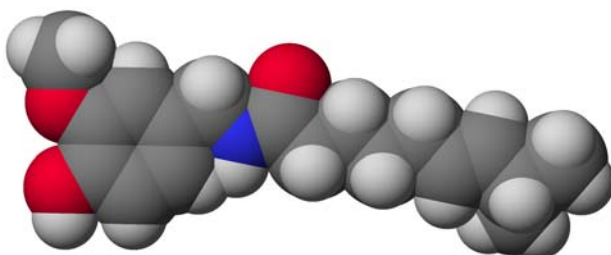
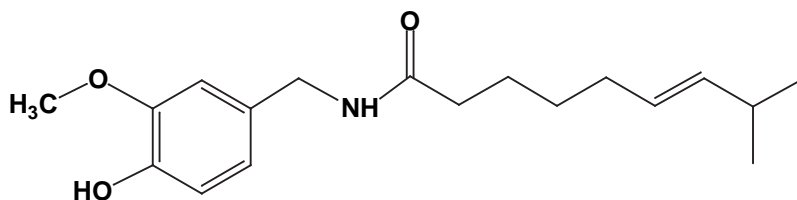


**Molecule of the week: Capsaicin****Concepts: Synthesis, Receptors**

**Capsaicin** is the active compound in red chile peppers. Because of the burning sensation that it produces capsaicin is used in foods to give them added heat. The degree of heat found within a food is measured on the Scoville scale and capsaicin is near the top at 15 million Scoville units (for more on Scoville units: <http://faq.gardenweb.com/faq/lists/pepper/2002075348029538.html>). Capsaicin is also used in topical ointments to relieve pain and is the active ingredient in the riot control agent "pepper spray". When the spray comes in contact with skin and eyes it is quite painful. The burning and painful sensations associated with capsaicin result from capsaicin's chemical interaction with sensory neurons. Capsaicin, as a member of the vanilloid family, binds to a receptor called the vanilloid receptor, an ion channel-type receptor. The "capsaicin high" is a euphoric sensation caused by the consumption of large quantities of capsaicin from capsaicin-laden foods. It's theorized that the pain induced by capsaicin causes the human body to release endorphins. Eventually, enough are released to create a sensation that is frequently compared to "runner's high." Capsaicin has found a unique use in preparing birdseed. Apparently, birds do not sweat over hot peppers. Squirrels that feed at bird feeders have receptors for capsaicin and can therefore taste it whereas birds do not (<http://www.squirrelproof.ca/faq.html>).

**Questions:**

Propose a synthesis of capsaicin from organic compounds containing 6 or fewer carbons.