



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Amber I. Hess</b>	<b>Science Fair Use Only</b>  <h1 style="margin: 0;">J0416</h1>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>How Big Is a Molecule?</b>	<b>Division</b> <u>J</u> Junior (6-8) <u>J</u> Senior (9-12)
<b>Preferred Category</b> (See page 5 for descriptions.) <b>4 - Chemistry</b>	
<b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p><b>Objective:</b> The objective is to determine if a monolayer of oleic acid on water can be used to determine the length of an oleic acid molecule.</p> <p><b>Materials and Methods:</b> Different amounts of oleic acid were diluted in methanol and dropped in an uncontaminated pan of water with lycopodium powder on the surface. Graph paper was placed underneath the pan to help measure the area of the monolayer, which was formed by a variety of intermolecular forces. Knowing the volume of the oleic acid and the area of the monolayer allowed me to determine the length of an oleic acid molecule.</p> <p><b>Results:</b> I measured the length of an oleic acid molecule to be 22.4 angstroms. This length of the oleic acid molecule is consistent with known values.</p> <p><b>Conclusion:</b> A monolayer of oleic acid on water can be used to determine the length of an oleic acid molecule.</p>	
<b>Summary Statement</b> (In one sentence, state what your project is about.) A monolayer of oleic acid on water can be used to determine the length of an oleic acid molecule.	
<b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. When it occasionally required two people, my dad helped me wash my glassware.	