



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

<p>Your Name (List all student names if multiple authors.) Wing Ho Cheung</p>	<p>Science Fair Use Only</p> <p style="font-size: 2em; font-weight: bold; margin: 10px 0;">S1307</p>
<p>Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Molecular Toxicity/Genotoxicity of Two Samples from INCO Refinery in Clydach, S. Wales, In Ref. io ihe Compound-Orcelite</p>	<p>Division _ Junior (6-8) <u>X</u> Senior (9-12)</p>
<p>Preferred Category (See page 5 for descriptions.) 13 - Pharmacology / Toxicology</p>	
<p>Abstract (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> <p>Objective: The objective of my project is to determine ways in which the presence of orcelite component within nickel compounds alter cell development.</p> <p>Materials and Methods: By treating C3H/10 T ½ mouse embryo fibroblast cells with different concentrations of nickel oxides, cell lines showing characteristics of foci formation, emergence of colonies in soft agar, and abnormal growth rates suggested cell transformation. Cytotoxicity, morphological transformation, phagocytosis, and chromosome aberration assays were then conducted to characterize the effects that the orcelite component has on the experimental cell lines. Through comparison of (a) plating efficiency, (b) reconstruction of focus formation, and (c) anchorage-independent growth assays data, the carcinogenicity of various nickel compounds can be determined.</p> <p>Results: Resulting cytotoxicity data determines both nickel samples to be lethal to cells at ~25 microgram /ml. Cytotoxicity data also indicates that the LC50 of both nickel samples to be approximately 1 microgram/ml. Transformation data shows that nickel compounds without the orcelite component did not induce foci formation. Preliminary Phagocytosis data confirms that there is a direct relationship between the exposure and uptake of nickel. Chromosome aberration assay data is not yet available.</p> <p>Conclusion: Miners and citizens who are constantly exposed to nickel compounds will uptake a high concentration of nickel oxide into their bodies. As cytotoxicity data has proven, uptaking high concentration of any nickel compound (regardless of its component) will inevitably causes cell death. In addition to inducing cell death, nickel compound with the orcelite component is also potentially carcinogenic to cells at any concentration.</p>	
<p>Summary Statement (In one sentence, state what your project is about.) A toxicology study to determine ways in which an orcelite component alters nickel compounds' chromosome aberration, phagocytosis, transformation, and cytotoxic potential.</p>	
<p>Help Received in Doing Project (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. Used lab equipment at University of Southern California under the supervision of Dr. Joseph Landolph and graduate student, Farrah Clemens.</p>	