Name: Vincent Kreft
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School: Bloomington High School North

I am a high school junior with a strong interest in science. I hope to earn a BS in chemistry to pursue medical school. I have always been very interested in the environment, as well as many social issues and Project Green Challenge has broadened my perspective on those subject matters. Ranging from green chemistry to biomimicry and social justice, I now feel that it is not only possible but essential that I incorporate environmental and social concerns in my studies.

The following three schools are my dream schools:

1) UC Berkeley
2) University of Chicago
3) Caltech

UC Berkeley:

In 2009, UC Berkeley created the Berkeley Center for Green Chemistry. Students in the department of Chemistry wanted to not only be taught the fundamental details of their science but also the broader effects that their science had on the society and the environment. What attracts me in Berkeley's chemistry curriculum is the way chemistry is taught and learned. For example, Berkeley's emphasis on how chemicals can be extraordinarily helpful to increase humans' life standards, but how they can also be very toxic. Not many chemistry classes highlight the toxicity of chemicals and their unintended secondary effects on the environment but at Berkeley this notion is introduced at the very start of the chemistry curriculum. Moreover, the Center is renowned for their interdisciplinary approach to chemistry and has helped shape policies that can better protect the public and the environment.

The very first chemistry class, Chem 1AL is a modular system and many of the modules in the course include green chemistry content. From the first week of classes, students partake in labs to make different biofuels and compare the ecotoxicity of them. It is clear that Berkeley requires that a student who graduates with a chemistry degree can demonstrate knowledge regarding toxicity, environmental, and social impacts of their actions. In my opinion, this is a very sustainable and innovative approach.

University of Chicago School of Medicine:

Chicago is a major metropolitan city and like many cities around the world, the issues of inequity were made painfully clear as the burden of covid-19 has been disproportionally borne by the people of color communities. In light of this, starting in the fall of 2021, the Pritzker School of Medicine launched a unique national program on Health Equity Advocacy and Anti-Racism that teaches first year medical students about the disparities in the healthcare industry. This is a very unique curriculum as one its goals is to explicitly integrate content related to biases, racism and disparities in providing health care to the population. I think that this is long overdue for a medical school to investigate social justice.

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My mom is from France, a country with universal health care and she never understood why the first thing she is asked when she goes to a doctor is to show her insurance card. It should be a priority in our societies to ensure that all humans have equal access to prevention and cure regardless of their racial or socio-economical background. I like to see that a school of medicine that is not far from my hometown of Bloomington is working with intent to try and solve the issues of health disparity. I particularly like how the courses combine classroom assignments, visits to south side clinics (home of the African American communities), and conversations with patients.

Caltech:

I was always interested in Caltech as it is one of the only schools in the world that has an undergraduate major in medical engineering. For this challenge, I looked at the school using another lens and what I discovered solidified their ranking as a dream school for me.

In 2009, Caltech founded the Resnick Sustainability Institute to become a leader in innovative science research for a sustainable future. It is not a major nor a minor per se however, it is influencing the science curriculum. Caltech stays in the front line of science education and research and this is shown with the Resnick sustainability institute. The institute proposes bold scientific solutions to the world's toughest challenges. I feel like this institute would give me the right focus to collaborate with like-minded individuals to create breakthrough scientific solutions to change the planet for the better. For example, the division of chemistry within the Institute, is currently working on microbial molecules that could advance human efforts to mitigate food insecurity. Another group of chemists are working on creating a new class of material to replace plastic, where the new chemical is programmed to be more readily depolymerized.

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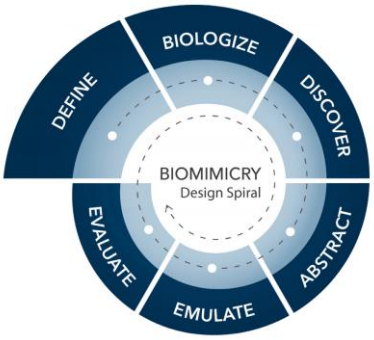
Dream Class: **Biomimicry and green chemistry**

Biomimicry and Green Chemistry

Green Chemistry focuses on removing intrinsic hazards to make chemical substances sustainable.



In nature, chemical processes are inherently sustainable, so we can learn a lot from nature.

Overview

Next semester I would love to take a class that shares elements of chemistry and biomimicry. In the biomimicry challenge I read that butterflies' wing have solved the problem of making environmentally friendly dye free paints. Also, I learned that through careful observation of tree leaves we created green fabric finish that is water repellent. Therefore, I would love a class that would allow me to explore further on how to utilize natural processes to solve human problems.

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Learning Objectives

Understand how to connect with nature—not to exploit nature but to learn from it.

- Concentrate on chemical reactions observed in nature.

Understand the key elements of biomimicry.

- Gain exposure to methods of biomimicry

Understand how to integrate green chemistry into design.

- Bring the principles found in nature to inform our sustainable design of chemicals.

Course format

Observation (field trips), Experimentation (lab work), Evaluation (collaborate with other disciplines)

- Identify the challenge that you want to address.
- Observe live animals and organisms in nature and in lab (for micro-organisms).
- Problem-solve through experimentations in lab.
- Assess the economic, cultural, regulatory feasibility of your innovation.

Course Content

- Biomimicry Thinking: what are the methods behind biomimicry?
- Life's Principles: how to devise and apply practical solutions seen in nature to our current challenges?

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