

A CRISPR Future in Berkeley 2033

A Proposed Foresight Workshop

Prepared for Berkeley City Council District 7

By Francesca Alfajora, Andrew Paden, and Brandon Welch



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Councilmember-Elect Robinson:

Our Strategic Foresight class at California College of the Arts' MBA in Design Strategy (DMBA) program has completed a research study on the impacts and opportunities of CRISPR technology on the University of California, Berkeley community, which is part of your council district.

We propose holding a pro-bono four hour workshop presenting our study findings of plausible scenarios involving CRISPR interest groups holding various agendas of regulation and de-stigmatization. The workshop of scenario storytelling, emerging issues exploration, presentation of a “future artifact”, and training in foresight techniques will occur at the Phoebe A. Hearst Museum of Anthropology.

The practice of strategic foresight allows organizations and communities to shape more desirable futures, and has become a required component of strategic planning in organizations such as Shell Corporation, the Bill and Melinda Gates Foundation, and UAE Ministry of Cabinet Affairs and Future. The study leaders are Cal alumni that have collective experience in design, bench research, sustainability, and business.

As a recent Cal grad and the newly elected leader of District 7, you are highly qualified to help advocate for consciousness around the potential impacts of and a preferred future for emerging genomic technologies.

We are excited for your support and will be following up with a phone call to your office next week.

Thank you,

Francesca Alfajora

Andrew Paden

Brandon Welch

Overview

CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is an emerging biotechnology with applications in medicine and biomedical research, but with broader potential uses and socio-environmental impacts to academic research centers and their surrounding communities.

The practice of strategic foresight is a multidisciplinary applied science that allows organizations and communities to shape more desirable futures, and has become a required component of strategic planning in organizations such as Shell Corporation, the Bill and Melinda Gates Foundation, and UAE Ministry of Cabinet Affairs and Future.

Students at California College of the Arts' MBA in Design Strategy (DMBA) program have completed a strategic foresight research study on the impacts and opportunities of CRISPR technology on the University of California, Berkeley community. UC Berkeley is located in Berkeley City Council District 7. Study leaders have proposed a thirty-participant CRISPR strategic foresight workshop to Berkeley City Councilman-Elect Rigel Robinson. The workshop consists of scenario storytelling, emerging issues exploration, presentation of a "future artifact", and training in foresight techniques will occur at the Phoebe A. Hearst Museum of Anthropology. The purpose of the workshop is to promote the creative and critical thinking skills of strategic foresight through the lens of a contemporary biotechnology issue.

Workshop Goals

The central goal of the workshop is to introduce participants to the analytical and creative methods of the strategic foresight "way of thinking" through an examination of the potential social impacts and economic opportunities of CRISPR. Participants will leave the workshop with foresight toolkit applicable to a wide range of technology, business, and policy questions.

Outcomes

The foresight workshop will achieve the following outcomes:

1. Increase participant awareness of society's most impactful and controversial, contemporary biotechnology issue.

2. Lead participants through a typical strategic foresight project workflow.
3. Introduce participants to the creative and critical thinking skills of strategic foresight.
4. Provide participants with an adaptable and timeless toolkit for strategic planning projects.
5. Allow participants to brainstorm and created a tangible artifact of their learning experience.

Who

The foresight workshop targets a group of thirty participants to represent a pool of diverse backgrounds. The thirty-participant group size is optimal for achieving both productive large group discussions as well as collaborative small group activities. Suggested workshop attendees should represent the voices of Berkeley's City Council District 7, UC Berkeley's faculty in anthropology and biology, and UC Berkeley students. While the purpose of the workshop is to build understanding, the only pre-work is for participants unfamiliar with CRISPR to watch a short YouTube video (see Appendix A).

Environment

Location

The workshop is proposed to take place at the Phoebe A. Hearst Museum of Anthropology, accessibly located at the center of UC Berkeley's campus. This unique venue was strategically chosen for context to frame the values of foresight and evolutionary issues of CRISPR technology. The museum's dark-toned and lowlight environment will help immerse participants into the "My Genes, My Choice" futures scenario.

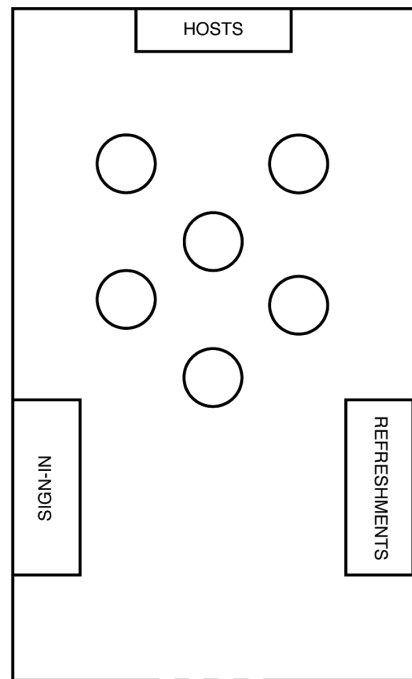
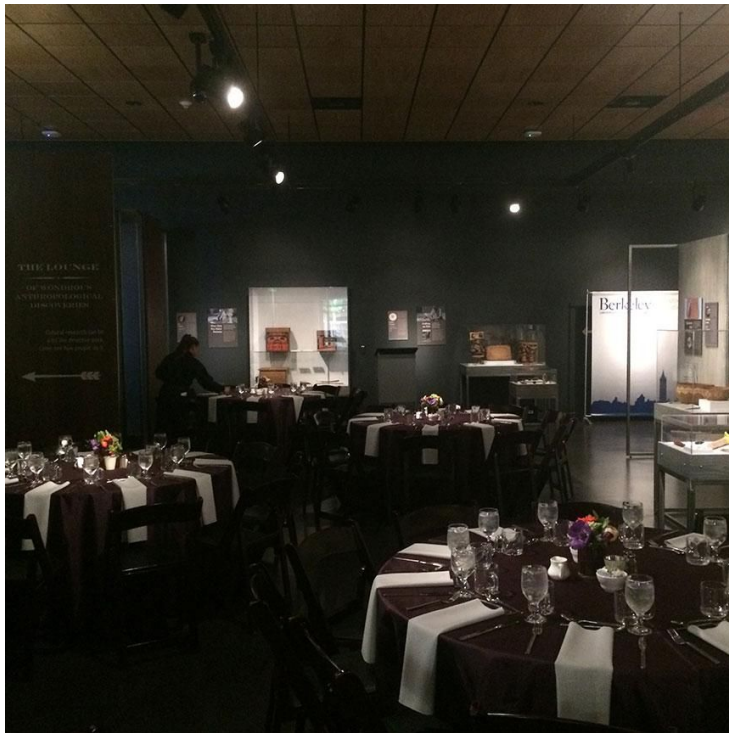
Layout

As guests enter the room, they will conveniently find the sign-in table to the left and refreshments immediately to the right. These tables will welcome them upon entry and assist in creating a more comfortable environment. The room easily holds the workshop size of thirty people. With a total of six round tables, approximately 5

participants will be seated per table to help sort participants into small groups. Tables should be round to encourage democratic group discussion. A podium will be located at the front on the room to command attention for the facilitators.

Requests

Facilitators will need either a projector and screen or large monitor to present their slides. They will need any other cables and connections, whether HDMI cables or extension cords, to set up their laptops to the projector. Strong WiFi connection or a WiFi password, in addition to speakers to play music during transitions and at the beginning of the event, is another essential component to having a successful outcome.



Experience

The workshop’s hands-on experience is a balance between ways of thinking and types of activities. The foresight workshop leads participants through a journey of a typical strategic foresight project; first research, then design. The first half of the workshop promotes critical thinking skills through research and analysis tools. The midway break gives participants time to transition from an analytical way of thinking to the equally useful, creative side of foresight. The second half of the workshop emphasizes creative thinking skills through designing “artifacts of the future.” This section of the workshop provides participants with a creative toolkit that is unique to strategic foresight. At the end of the workshop session, participants should feel accomplished that they have brainstormed and created a tangible artifact of their learning experience.

The workshop is also designed in a rhythmic flow of learning through formal presentation, small group activity, and large group discussion. This helps keep participants engaged from one activity to the next. In addition, the various types of activities help to give opportunities to different preferred participation styles.

Logistics

Official Workshop Time: 09:00 - 13:00

Location: Phoebe A. Hearst Museum of Anthropology, UC Berkeley

Materials: Sticky notes, sharpies, colored markers, CRISPR artifact of the future, “The Thing from the Future” game, worksheet guide, poster materials

Order of Events:

| Time | Topic | Activity | Who? |
|-----------------|-------------------------|---|---|
| 08:30 30 min | Setup and Coffee | Setup Setup room to layout, food, and technologies specifications outlined above. | Room Layout, Materials, & Food Setup: Welch |
| | | Pastries and Coffee Allow participants to get settled and have light breakfast. | Technical Setup: Paden Guest Check-in and Greetings: Alfajora |

| | | | |
|-----------------|-------------------------------|---|--|
| 09:00 15 min | Workshop Introductions | <p>Team Backgrounds (2 min) Introduction of facilitators' backgrounds and qualifications.</p> <p>Agenda (3 min) Agenda overview to provide transparency to participants.</p> <p>Ground Rules (8 min) Establish roles, rules, and expectations.</p> <p>Workshop Objectives (2 min) Objectives overview to provide clarity of workshop goals.</p> | <p>Lead Presenter and Facilitator: Welch</p> <p>Support: Paden</p> <p>Late-comer Guest Check-ins: Alfajora</p> |
| 09:15 15 min | Foresight Introduction | <p>“My Genes, My Choice” Scenario and Artifact (10 min) Storytelling presentation of the scenario and discovery of the “My Genes, My Choice” futures artifact (see Appendix B).</p> <p>A Call for Futurists (5 min) A case for why the world needs more foresight strategists and the values and benefits of Strategic Foresight frameworks.</p> | <p>Lead Presenter and Facilitator: Paden</p> <p>Support: Alfajora and Welch</p> |
| 9:30 60 min | Trends and Signals | <p>Trends and Signals Presentation (15 min) Presentation introduction of trends and signals concepts, and useful tools such as environmental scanning and s-curve model.</p> <p>Trends and Signals Breakout Group Activity (15 min) Participants break out into small groups to apply introduced concepts and tools to “My Genes, My Choice” scenario.</p> <p>Large Group Discussion (15 min) An opportunity for groups to present their findings, exchange ideas, and ask questions.</p> <p>Emerging Issues Presentation</p> | <p>Lead Facilitator and Presenter: Paden</p> <p>Emerging Issues Guest Speaker: Dr. Jennifer Doudna, UC Berkeley Professor and Co-founder of CRISPR</p> <p>Facilitation Support and Breakout Group Help: Alfajora and Welch</p> |

| | | | |
|------------------|---------------------------------|---|---|
| | | (15 min) Industry leader informs participants about emerging issues in the global CRISPR debate. Grounds the case for why the scenario is relevant to the world today. | Food Setup: Welch |
| 10:30 30 min | Break | Appetizers and Refreshments Serve Appetizer Sandwiches and Drinks | |
| 11:00 105 min | Artifact from the Future | <p>“The Thing From the Future” Game (15 min) Warm-up small group exercise to transition from analytical to creative thinking.</p> <p>Artifacts from the Future Presentation (15 min) An introduction of Artifacts from the Future and case study examples.</p> <p>Future Protest Sign: Breakout Group Activity (30 min) Small groups are tasked to create an artifact of the future in the form of a protest sign for the “My Genes, My Choice” scenario. Each small group will be assigned an interest group with a specific point of view. Worksheet guides will help groups to internally facilitate (see Appendix C).</p> <p>Protest Debate (30 min) Groups use their signage artifacts to engage in a debate about their unique points of view.</p> <p>Large Group Discussion (15 min) Participants take part in a conversation to reflect on the range of viewpoints, creating futures artifacts, challenges, and discoveries.</p> | <p>Lead Facilitator: Alfajora</p> <p>Facilitation Support and Small Group Floaters: Paden and Welch</p> |
| 12:45 15 min | Wrap Up | Resources Handouts (2 min) Distribute and discuss the list | Lead Facilitator: |

| | | | |
|-----------------|-------------------|--|---|
| | | <p>of accessible resources for foresight tools, templates, and CRISPR articles.</p> <p>Wrap Up Reflection (5 min) Facilitator recites insights learned from earlier activities and frame it to fit with outcomes.</p> <p>Question and Answer (7 min) Facilitator to address any unanswered questions from workshop participants.</p> | Welch |
| 13:00 30 min | Break Down | <p>Extra Question and Answer Stay behind for extra questions and comments from participants.</p> <p>Break Down Restore room layout, clean up food and materials, and pack up technological equipment.</p> | <p>Guest Questions: Alfajora</p> <p>Room Layout, Materials, & Food Break Down: Welch</p> <p>Technical Break Down: Paden</p> |

Biographies



Francesca Alfajora, Lead Workshop Experience Designer

Francesca is an experience designer, completing her Bachelor's of Arts in Architecture at UC Berkeley (GO Bears!). Francesca's professional career spans the experience design spectrum of working in architectural firms like FORGE and digital platform startups like Pillow.

Besides pursuing her MBA in Design Strategy at the California College of the Arts, Francesca dedicates her spare time serving as the SF Regional Council Leader for the nonprofit ACE Mentor Program. Through the ACE Mentor Program, Francesca has gained experience in planning afterschool programs and facilitating student orientations and lesson plans. Francesca's role in the foresight workshop team is essential to crafting participant learning experiences. She designs activities and experiences valued by participants while aligning with workshop objectives and outcomes.

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Brandon Welch, Marketing & Logistics Director

Brandon Welch is an artist, designer, and entrepreneur, from Grand Rapids, Michigan. He recently graduated with honors and received a Bachelor of Fine Arts in Design from Howard University and is currently a MBA/MFA dual-degree candidate. In addition to his formal undergraduate education, he's cultivated a skill set for himself through his own business ventures.

In 2013, at the age of 16, he launched his own fashion label CRANIUM. Now, he oversees a talented team who assist with daily operations while he focuses on business strategy, creative direction, and the overall identity of the company. He's also interned at fashion label Aspiga in London, Adobe in San Francisco, and Smithsonian's Hirshhorn Contemporary Art Gallery in Washington D.C. With experience managing a team, planning events to help market the label, and collaborating with individuals across various disciplines, he will be a major asset to the logistics, branding, and marketing of the event.

www.linkedin.com/in/skottywelch/



Andrew Paden, Science & Technology Manager

Andrew Paden is a biologist and environmental planner with twelve years of experience in biological and paleontological resources, compliance management, and impact analysis, as well as six years of research experience in neurobiology and environmental biotechnology. Andrew holds a BS in Biology from UC Berkeley, an MS in Biology from CSU Channel Islands, and is an MBA in Design Strategy candidate at California College of the Arts.

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MBA in Design Strategy (DMBA)

The groundbreaking MBA in Design Strategy (DMBA) program at California College of the Arts fosters the new type of creative leader eager to design a world that is profitable, ethical, and remarkable.

Appendices

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Appendix A: Pre-work Resource

Biologist Explains One Concept in 5 Levels of Difficulty - CRISPR | WIRED
https://www.youtube.com/watch?v=sweN8d4_MUg

Appendix B: “My Genes, My Choice” Futures Artifact

The artifact is invited to be displayed at the Institute for the Future’s (ITF) Gallery. ITF will house the artifact after the foresight workshop.



Appendix C: Artifact of the Future Worksheet Guides

Artifact of the Future Worksheet Guide Protest Poster Creation - Student Group

Scenario:

In 2033, CRISPR technology is heavily regulated and strictly limited to treating life-threatening diseases. Violators caught using unpermitted CRISPR enhancements undergo criminal punishment. UC Berkeley students forego risks to run an underground CRISPR market where they edit their genes, increasing the production of performance enhancing neurotransmitters. Students resort to illegal CRISPR enhancements to stay competitive and relevant against artificial intelligence.

Task:

Set in Berkeley 2033, your group is participating in the next large protest regarding the future of CRISPR at UC Berkeley. Your group is tasked to create a slogan or myth/metaphor of your best argument based on your interest group's point of view on CRISPR. Your protest poster should be informed by this slogan.

Interest Group: Student Group

Point of View: Legalize CRISPR

Questions to Consider as the Student Group:

- Why are you using CRISPR?
- What kinds pressures and expectations are you be experiencing as a student?
- What would it mean to compete against other schools who allow their students to use CRISPR enhancements? How can UC Berkeley expect other schools to stay regulated?
- What would it mean to compete against artificial intelligence?
- How do you feel about UC Berkeley's policies and stance on CRISPR?

Artifact of the Future Worksheet Guide

Protest Poster Creation - Patient Advocacy Organization

Scenario:

In 2033, CRISPR technology is heavily regulated and strictly limited to treating life-threatening diseases. Violators caught using unpermitted CRISPR enhancements undergo criminal punishment. UC Berkeley students forego risks to run an underground CRISPR market where they edit their genes, increasing the production of performance enhancing neurotransmitters in regions of the brain. Students resort to illegal CRISPR enhancements to stay competitive and relevant against artificial intelligence.

Task:

Set in Berkeley 2033, your group is participating in the next large protest regarding the future of CRISPR at UC Berkeley. Your group is tasked to create a slogan or myth/metaphor of your best argument based on your interest group's point of view on CRISPR. Your protest poster should be informed by this slogan.

Interest Group: Patient Advocacy Organization (Planned CRISPRhood)

Point of View: De-stigmatize CRISPR

Questions to Consider as the Patient Advocacy Organization:

- What do you think are the stigmas for CRISPR?
- What methods and actions can you take to help de-stigmatize CRISPR?
- How do you feel you can best support patients?
- How do you feel about UC Berkeley's policies and stance on CRISPR?

Artifact of the Future Worksheet Guide

Protest Poster Creation - Medical/Research Institution

Scenario:

In 2033, CRISPR technology is heavily regulated and strictly limited to treating life-threatening diseases. Violators caught using unpermitted CRISPR enhancements undergo criminal punishment. UC Berkeley students forego risks to run an underground CRISPR market where they edit their genes, increasing the production of performance enhancing neurotransmitters in regions of the brain. Students resort to illegal CRISPR enhancements to stay competitive and relevant against artificial intelligence.

Task:

Set in Berkeley 2033, your group is participating in the next large protest regarding the future of CRISPR at UC Berkeley. Your group is tasked to create a slogan or myth/metaphor of your best argument based on your interest group's point of view on CRISPR. Your protest poster should be informed by this slogan.

Interest Group: Medical/Research Institution

Point of View: Regulate CRISPR

Questions to Consider as the Medical/Research Institution:

- What are the consequences of not having enough research on genetics?
- What are the dangers to have untrained students using CRISPR?
- What would it mean for evolution if CRISPR modifies the germ line (genes passed on for every generation after)?
- Where do you draw the line of who should have access to CRISPR and what it should be used for?

Artifact of the Future Worksheet Guide

Protest Poster Creation - Conservative Interest Group

Scenario:

In 2033, CRISPR technology is heavily regulated and strictly limited to treating life-threatening diseases. Violators caught using unpermitted CRISPR enhancements undergo criminal punishment. UC Berkeley students forego risks to run an underground CRISPR market where they edit their genes, increasing the production of performance enhancing neurotransmitters in regions of the brain. Students resort to illegal CRISPR enhancements to stay competitive and relevant against artificial intelligence.

Task:

Set in Berkeley 2033, your group is participating in the next large protest regarding the future of CRISPR at UC Berkeley. Your group is tasked to create a slogan or myth/metaphor of your best argument based on your interest group's point of view on CRISPR. Your protest poster should be informed by this slogan.

Interest Group: Conservative Group

Point of View: Prohibit CRISPR

Questions to Consider as the Conservative Interest Group:

- What may be the relationship of various religions with the technology of CRISPR?
- What should be the role of man altering evolution with CRISPR?
- What are the consequences of CRISPR on the status-quo?
- Where do you draw the line of who should have access to CRISPR and what it should be used for?

Appendix D: Pilot Workshop of Artifacts of the Future







“It was excellent! I really enjoyed the activity...”

- Service Designer from Sutter Health

“I like how you took us through a story. First you discovered the sign in a dumpster, then introduced the scenario, and then had us participate in creating posters for the protest...”

- Designer from Institute for the Futures