

The Code Breaker

screenplay by

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Based on the book by Walter Isaacson

FADE IN:

INT. HARVARD COLLEGE LECTURE HALL - DAY

A college biochemistry class in a large lecture hall at Harvard. It's the last lecture. The board is filled with drawings of DNA, RNA, and different proteins.

PROFESSOR SZOSTAK (60) leans on the lectern with the Harvard Shield. He looks out to over 300 college juniors who all look smart and attentive. The students are half male, half female.

PROF SZOSTAK

And that's all the content for this course.

He puts down the chalk.

PROF SZOSTAK (CONT'D)

I want to finish off the semester by telling you a story. It's about one of my past students, one that I'm most proud of.

Students lean forward, listening attentively.

PROF SZOSTAK (CONT'D)

She belongs to a rare breed of scientist, one that I hope all of you can become. She's somebody who's good at doing hands-on experiments and also good at asking big questions.

Prof. Szostak looks up, reminisces about this student.

PROF SZOSTAK (CONT'D)

Big questions are grand questions that our mortal minds may never be able to answer. But of these big questions, the closest to being solved is how life began.

(slight pause)

My student Jennifer helped answer that question. And her journey is the story I want to tell you for the rest of the lecture. She grew up in a small town in Hilo, Hawaii...

CUT TO:

EXT. HILO, HAWAII - DAY - 1970

We're in Hawaii with beaches and palm trees in a volcano-studded region. Against the backdrop of the pristine nature are a series of identical-looking houses newly erected along the flanks of the Mauna Loa volcano.

CUT TO:

EXT. SIDEWALK IN HILO - DAY

We gradually see more of the ground and the plants that grow in Hilo, Hawaii. Moss and mushrooms, peach and arenga palms. Meadows filled with lava rocks covered in ferns.

We now zoom into two girls biking along the sidewalk.

JENNIFER (14), a blond girl, bikes home in an old aluminum bike with her classmate LISA, same age.

As they bike, they go past local Hawaiians that make Jennifer look completely like a freak. Jennifer looks different from the locals.

Lisa looks like she's from a typical mixed-race family: partly European, partly Asian, and partly Polynesian.

LISA

Are you sure about it?

JENNIFER

About what?

LISA

That you'll be skipping another grade?

A truck zooms past them. Jennifer is put off balance by the sudden loud roars of the truck engine. She stabilizes herself.

JENNIFER

(struggling with the bike)

Mr. Taki said I should, so I guess I have to.

LISA

No, no you don't have to. Who's gonna sit next to me in class next semester.

(sighs)

(MORE)

LISA (CONT'D)  
 And those boys in the grade  
 above... they're gonna call you a  
 haole.

(Haole is a pejorative word used to describe non-natives in Hawaii, people like Jennifer.)

Jennifer suddenly stops and gestures to Lisa to stop at the curb.

JENNIFER  
 Wait! Stop right here!

Jennifer leaps off the bike. Her aluminum bike drops to the concrete ground, making a clashing sound. She dashes into the small grassy area along the bike path.

EXT. GRASSY AREA NEAR JENNIFER'S HOME - CONTINUOUS

LISA  
 (running, out of breath)  
 Wait where are you going?

JENNIFER  
 Come check this out!

Jennifer bends down, her short hair messy. She breathes heavily.

Close up of a seemingly unremarkable plant with purple flower heads arising from the leaf axils.

Jennifer touches the plant. The plant responds to the her touch. Its leaves slowly close, wrapping around the main stem. She bends down and looks at it closer.

JENNIFER (CONT'D)  
 It's shy. Shy grass.

LISA  
 Shy grass?

Lisa touches a shy grass nearby, and the leaves closes.

LISA (CONT'D)  
 Woah!

JENNIFER  
 Yea, it closes. The leaves. Maybe  
 they can feel our touches?  
 (MORE)

JENNIFER (CONT'D)  
(she pauses to think)  
But how?

CUT TO:

INT. JENNIFER'S HOUSE - LATER

It's a nice house. MARTIN (38) is not only Jennifer's dad but also a literature professor. He looks academic: thick lenses in a heavy metal frame, his blue shirt is all buttoned up except the top one, tucked neatly in his pants. He looks like he just got back from teaching.

Martin is surprised to see Jennifer's clothes this dirty.

MARTIN  
(a little worried)  
My sweet Jen, how are you? Is everything ok?

JENNIFER  
I'm totally fine! Lisa and I went to check out the shy grass.

MARTIN  
Shy grass! Interesting. Oh and before I forget...

Martin's hand lands on a stack of hardcover books casually placed on the dinner table. He picks out one.

MARTIN (CONT'D)  
I have something for you.

It's a book called "The Double Helix." On the cover is a picture of the structure of the double helix that forms DNA. Jennifer bolts back from the other side of the hallway.

JENNIFER  
A detective book?

A slight pause. Martin almost said "no", but quickly revises his answer.

MARTIN  
Yep, a detective book!

Jennifer yanks the book from Martin. She looks at the cover more carefully. A big smile on Jennifer's face. We see a close up of the double helix on the cover.

FADE TO:

INT. HILO HIGH SCHOOL CLASSROOM - DAY

Slowly the double helix structure on the book cover fade into a double helix drawing on a chalkboard. Zoom out to see the chalkboard filled with chemical equations, drawings of different chemical bonds and structures. It's a dense board.

MR. TAKI (56), an old Japanese American man and the chemistry teacher and guidance counsellor, slashes his half-gone chalk on the board, leaving a stream of chalk powder in the air. He lifts his right hand up.

MR. TAKI

The structure of DNA. It's a polymer composed of two polynucleotide chains that coil around each other to form a double helix.

Jennifer's eyes fixate on the double helix.

Mr. Taki's writing on the chalk board looks like it's printed. His voice sounds strict and precise. He's someone with a lot of traditional attitudes.

MR. TAKI (CONT'D)

Now, I realize that I'm only drawing this for perhaps a couple boys in this room. For the rest of you, I don't expect you to understand or study this when you go to college. So I'm mainly wasting my time, but it's fun for me.

Boys elbow bump each other. Most girls, except Jennifer, are joining in the laughter. We move closer and closer to Jennifer from the front of the room and see Jennifer still making sense of the chalkboard. A BOY laughs the loudest.

BOY

Oh I see our haole wants to do science.

Jennifer doesn't notice.

CUT TO:

INT. TAKI'S OFFICE - LATER

We see Mr. TAKI's name card on the wall next to his office door. It says: "MR. TAKI, chemistry teacher, guidance counsellor"

We enter his office. On the wall are a dozen of college banners and flags: Brigham Young University-Hawaii, Hawai'i Pacific University, University of Hawai'i at Hilo.

Jennifer sits in front of Mr. Taki's desk, which is messy with piles of paper.

JENNIFER

Mr. Taki, I have my college applications ready. Could you help me look over them?

She hands in her application forms. Slowly zoom into one piece of paper. We see a college application. We see clearly a particular cell on the application form: "Intended major: biochemistry."

MR. TAKI

Are you sure about this? I told you not to...

JENNIFER

But I really want to, Mr. Taki, I'm interested in it.

Mr. Taki grunts. When he finally looks at her, he seems mad.

MR. TAKI

No, no, no... but girls don't do science.

Mr. Taki looks visibly angry, as if Jennifer has committed a crime.

MR. TAKI (CONT'D)

I need to talk to your parents about this. And I know you also signed up for the College Board chemistry exam. Do you even know what it is, or what the test is for?

He circles the "Intended major" cell with a red pen, puts a question mark next to it.

Jennifer, determined not to cry in front of him, reaches for form she just submitted, and rushes out.

INT. HILO HIGH SCHOOL HALL WAY - CONTINUOUS

Jennifer weeps in the hallway, as she passes through droves of boys. Those boys look familiar, they were her classmates.

They turn to her, some laugh and point at her. Jennifer starts running...

She passes MS. WONG (32), a Chinese American science teacher, who notices her.

Ms. Wong stands out among the teachers at Hilo High. She's a new teacher: young, fresh out of university.

MS. WONG  
Jennifer! Come here please. What happened?

Ms. Wong sees the form Jennifer holds.

MS. WONG (CONT'D)  
May I?

Ms. Wong sees the red circle around the biochemistry major. She immediately understands.

MS. WONG (CONT'D)  
Let's take a walk.

EXT. HILO HIGH SCHOOL PLAYGROUND - CONTINUOUS

It's recess time. Students are rushing out through the backdoor to play pickup basketball.

We see Jennifer and Ms. Wong at a bench right outside of the science lab room, where Ms. Wong taught Jennifer last semester. They face the basketball court.

JENNIFER  
Maybe I shouldn't...

MS. WONG  
No you should. Ever since I taught you last semester, I thought you should go into science.

Jennifer turns to look at Ms. Wong, shocked that a teacher would ever say that. She's never gotten that type of support before.

JENNIFER  
Really?

MS. WONG  
If there's anyone who should study science from Hilo High, it should be you.



JENNIFER

But what if I never make it?  
Science in college must be hard.

MS. WONG

Can I ask you why you want to study  
science?

JENNIFER

I just think it's interesting. It's  
like, it's like...

Jennifer struggles a bit as she searches for words.

JENNIFER (CONT'D)

It's like a detective novel! I like  
solving puzzles.

MS. WONG

Those are all true, but you can't  
really do science if that's all.  
Science is about discovery. It's  
about figuring out how the natural  
world works. Once you start to  
enjoy that, you can do real  
science.

A couple boys look at Jennifer and Ms. Wong.

MS. WONG (CONT'D)

Meet me Thursday after school in my  
office. Bring your college  
applications.

CUT TO:

EXT. HARVARD UNIVERSITY - DAY - FIVE YEARS LATER

We see the back of a biker, biking from Harvard's biomedical building. Gradually reveal that it's Jennifer, now a PhD student. Biking with her is TOM, similar age, wearing a white coat. On the left side of white coat, it says "Harvard Medical School", on the right "Tom Griffin, Medical Student," in a cursive font.

JENNIFER

This is all so different from  
Pomona.

TOM

You went there for undergrad?

JENNIFER

Yea, it's so much smaller. I loved it.

(a beat)

Where did you go for undergrad?

TOM

Here.

JENNIFER

You mean Boston, or H...

TOM

Harvard.

JENNIFER

Round two for you I guess.

(slight pause)

See I feel like I won't like college here, makes me feel like a small fish in a big pond.

TOM

How's your experiment going?

JENNIFER

It worked.

TOM

But Szostak said...

JENNIFER

Szostak said it wouldn't work. I know. But my way is actually better.

TOM

What did you do?

JENNIFER

Yeast cells. They're really good at taking up pieces of DNA, and absorbing that into their own genetic makeup.

They arrive at Beat Brew Hall. Jennifer and Tom locks their bike.

INT. BEAT BREW HALL - CONTINUOUS

A busy bar near Harvard. At the corner are six people gathered around a small section of the bar. PROFESSOR SZOSTAK (38) wears rectangular glasses with a black frame.

PROF SZOSTAK

I propose we shift directions. To study the RNA.

SCIENTIST 1

No, everyone is studying DNA.

SCIENTIST 2

I agree, DNA is the future, especial after the Human Genome Project.

PROF SZOSTAK

We can't do what everyone else does.

(seeing Jennifer)

Oh Jennifer!

Everyone turns to Jennifer as she arrives. Tom trails Jennifer, he maintains distance from her.

PROF SZOSTAK (CONT'D)

Let me introduce you.

(he turns to the group)

Ok so this is Jennifer. She just started her PhD here and joined our lab for her rotation a couple weeks ago.

Tom keeps his distance from Jennifer this whole time. Prof. Szostak turns to him.

PROF SZOSTAK (CONT'D)

Everyone has already met Tom, maybe except Jennifer.

Jennifer and Tom exchanges eye contact. They obviously already know each other, but Szostak doesn't know that.

PROF SZOSTAK (CONT'D)

Tom is a second year student in our lab.

(pointing at Tom)

You two should get to know each other. You're both relatively new and will have to work on projects together.

Jennifer looks down, hiding her smile.

JENNIFER

Thanks professor.

PROF SZOSTAK

(continues)

As I was saying, we need to focus on RNA. Some RNA molecules could store genetic information and also act as a catalyst to start chemical reactions.

Jennifer listens as she looks at the people at the bar. We see what Jennifer sees... The movie fades away as she observes...

- A pair of identical twins sit next to each other on the table, they drink from one coffee mug.

- An old man with gray hair sits on a wheelchair, his body shakes uncontrollably, his daughter feeds him fries.

- A middle-aged lady, her hair shaved, looks physically weak and skinny from chemotherapy. Her family surrounds her at the table. Her husband reaches across the table to touch her hand.

Tom notices that Jennifer is participating, until she turns back to the discussion, interrupting.

JENNIFER

If some RNA molecules could store genetic information and also act as a catalyst to start chemical reactions, then they might be more fundamental to the origin of life than DNA.

Tom nods. A long pause — everyone wants to see if Prof. Szostak gets mad at Jennifer's interruption. She keeps going.

JENNIFER (CONT'D)

All this time, we've been learning about the structure and code of DNA. We learn about how proteins do all the heavy lifting in cells, and RNA is this dull thing... A middle manager.

She finally makes eye contact with members of the lab.

JENNIFER (CONT'D)

But what if more than just that?

Szostak smiles. She's exactly right.

EXT. HARVARD UNIVERSITY - LATER

The lab party ends. Szostak and the rest are tipsy, exiting the bar, but tries to main the composure expected out of scientists, post-docs, and PhD students.

Tom and Jennifer exit shortly after. They walk slowly on the street covered with fall leaves. The other bars and restaurants are just starting their busy evening, couples holding hands walk past.

EXT. BEACON ST, BOSTON - CONTINUOUS

A narrow two-way road sandwiched between rows of old shops in apartments and houses all dating back to 1700s or 1800s. Street lights are turned on, but the sun has just set, we can still see the historic Boston Common from afar. Nothing can look more like Boston than this.

Tom no longer maintains an arbitrary distance from Jennifer.

JENNIFER

It's funny how Szostak thought we didn't know each other.

Jennifer smiles.

TOM

I think you were on to something.  
Working on RNA.

JENNIFER

Oh yeah?

TOM

Clearly.

JENNIFER

Thanks.

TOM

I noticed you were completely zoned out for a bit during the happy hour. What happened?

JENNIFER

I just saw all these people, sick, dying... If we can actually understand RNA and how it works, anything would be worth it. But I'm just afraid...

TOM

Yea it's a risky bet. If you don't make a big discovery, it's like a hard crash, hard to recover from it.

JENNIFER

Exactly.

Beat. Tom mulls it over.

TOM

But what if you do?

JENNIFER

If I figure out how RNA works?

TOM

And how it controls life.

JENNIFER

Then we're gonna change the world.

EXT. PIZZA RESTAURANT - LATER

Tom and Jennifer enter a pizza restaurant on Beacon Street. They share a Margherita pizza. An old jazz track is playing.

They're seated across from each other. Jennifer's faces still have echos of the excitement from the earlier discussion. Brightness in her eyes.

TOM

You're crazy.

JENNIFER

I'm what?  
(a beat)  
You're not smooth at all.

TOM

No I don't mean crazy in a bad way. I mean I like your intensity when you approach work.

JENNIFER

Ok, maybe I am crazy then.  
(a beat)  
You know when they say they admire you, but secretly they think you're a psycho?

TOM

Somebody admires you? I didn't say that.

JENNIFER

Shut up. Let me continue. All throughout college, when others are having fun and living a normal college life, I was working late nights in the lab.

Tom grabs a slice of pizza.

JENNIFER (CONT'D)

People think I'm too intense, too focused, too scientific. They're afraid of me. They keep a distance.

TOM

Yea I get that.

JENNIFER

And it's from a lot of people, even in the lab.

Tom is clearly into Jennifer.

He is one of those guys who's brilliant and intelligent, but distracted by a lot of his hobbies. Jennifer has a singular focus – science. He knows this doesn't work for him, but he admires those who can be so singularly focused.

TOM

I feel it too. We're actually doing hard things. We're trying to discover something new. And most people won't appreciate it, because they don't understand it.

He scoots her legs. His knee happens to touch Jennifer's. She notices. So does he. They look at each other.

TOM (CONT'D)

For example, I grew up in a small town and I was always "the genius" in my class. But all my parents want to use my talent for is to make money. When I said I'm going to graduate school, we got into a big fight.

Suddenly the jazz stops and a slow romantic song starts.

JENNIFER  
I get it. I feel you.

TOM  
I like this song.

JENNIFER  
Me too...

They kiss, mouths full of Margherita pizza. It's unexpected, but it's nice.

CUT TO:

INT. HARVARD HALLWAY - DAY

A narrow hall way with pictures of old men - professors, doctors, and scientists - hang on both sides of the hall.

Jennifer, Tom, and other scientists are rushing through the hallway. Jennifer walks the fastest, ahead of Tom, who tries to catch up to Jennifer's pace.

JENNIFER  
We're going to be late, hurry up everyone.

They turn the corner and arrive at a room with glass walls, glass windows, and glass everything. The glass wall also acts as a whiteboard, except from the other side we can see what's drawn: chemical molecules, experiment designs, and structures of RNA and DNA.

INT. HARVARD CHEMISTRY LAB - CONTINUOUS

Jennifer pushes open the door, almost hitting someone already inside. We see a room of all male scientists, except Jennifer.

Prof. Szostak stands in front of the glass board.

PROF SZOSTAK  
I don't want to spend too much time convincing everyone of this.

He seems impatient, but also very proud, as if he's sure what he's about to say is 100% correct.

PROF SZOSTAK (CONT'D)  
DNA may be the famous molecule, but it doesn't do much work. But RNA on the other hand...



Jennifer interrupts like Hermione Granger.

JENNIFER

RNA actually goes out and does real work.

PROF SZOSTAK

And if we can show that RNA might be the precursor molecule leading to the creation or formation of life, then we need to study how RNA replicate.

When the meeting is dismissed, we see that the team goes back to work in the lab.

Pan to show a row of beakers, pipettes, and other equipments on the lab bench, as well as microscopes and scales.

Jennifer conducts experiments with various equipments. She wears PPE and has her sleeves rolled up. She hops around various parts of the lab space to get material from different cupboards, while collaborating with others in the room.

Jennifer and Tom work closely on the project on RNA. They speak to each other pretty frequently, exchanging ideas and helping each other out. They may seem to be purely professional partners, but we know that they are also romantically involved.

They type up a manuscript on a desktop computer.

CUT TO:

INT. HARVARD CHEMISTRY LAB - DAY - MONTHS LATER

Prof. Szostak enters the lab triumphantly with a copy of the latest *Nature* journal.

PROF SZOSTAK

(almost yelling)  
It's published!

Jennifer's hand shakes, dropped the pipette she holds. It breaks on the ground. Thankfully, it's just water inside.

Jennifer hurries to Prof. Szostak.

The magazine is flipped to a page where we see Jennifer and Tom's name being listed as co-authors. On the abstract section, it reads:

"This reaction demonstrates the feasibility of RNA-catalyzed RNA replications."

PROF SZOSTAK (CONT'D)  
 Congrats to all of you, this is a  
 great accomplishment.

Tom and Jennifer hug affectionately.

CUT TO:

INT. HARVARD CHEMISTRY LAB - DAY

Tom walks into the lab in sneakers and a plaid flannel. Looks like he's playing the guitar before he came into work. He's holding an envelope in his hand.

TOM  
 Seems like your dad has written to  
 you again.

Close up of the envelope Jennifer is holding. We see the following:

Martin Doudna  
 1421 Mona Loop,  
 Hilo, HI 96720

Jennifer opens the letter. It reads:

MARTIN  
 (in writing)  
 Dear Jennifer, how are you holding  
 up in Boston?  
 Things are going well in our end,  
 except I've been getting a lot more  
 tired recently. I guess I'm getting  
 old.  
 I still see Lisa every now and  
 then. She's just been hired by PBS  
 Hawaii as a local journalist. I'm  
 sure you are in touch with her.

We pan from the letter to Jennifer. She smiles and reminisces about her childhood with Lisa. She reads on:

MARTIN (CONT'D)  
 (in writing)  
 I really hope you can find someone  
 who can support you. Not only  
 someone who understands you but  
 also someone who can make time when  
 you need it.

Jennifer and Tom look at each other, both smile.

MARTIN (CONT'D)

(in writing)

You've always been a stubborn girl,  
but you can't let work consume all  
of you. I hope you can take care of  
yourself and have some free time  
with people you love.  
Love, Dad.

CUT TO:

EXT. HARVARD YARD BENCH - LATER

We see Jennifer and Tom on a bench in Harvard Yard. Doves of tourists and high schoolers visit the school.

TOM

It's funny your dad wrote those.

JENNIFER

He's always like that.

TOM

Seems to really care about you.

JENNIFER

Yea he really does.

TOM

I heard you got in touch with Dr.  
Cech?

JENNIFER

I was surprised. He called me a few  
days ago.

TOM

His lab is the best place to study  
RNA structure. You know that right?

JENNIFER

Of course I do. I'm seriously  
thinking of doing a post-doc there.

Tom couldn't believe it. He's beaming with surprise. He's been wanting to move to Boulder/Colorado for years, and it seems that everything will work out well if Jennifer actually becomes a post-doc there as well.

TOM

Did you know that I love Colorado?  
My parents are from there.

CUT TO:

EXT. UNIV OF COLORADO BOULDER - DAY - A YEAR LATER

With the backdrop the magnificent Colorado mountain range, we see the campus of University of Colorado Boulder. Tom drops Jennifer off at the chemistry building.

Zoom into Jennifer's ring on her right ring finger. It's clear that Jennifer is now married to Tom.

TOM

See you at 9:00, darling. Good luck  
on your first day.

Jennifer heads into the building. Tom continues to drive to his workplace, a biotech company.

INT. UNIV OF COLORADO BOULDER HALLWAY - LATER

In the chemistry building hallway, we see THOMAS CECH (50). He is a genial old man who had already won a Nobel Prize for discovery of introns.

Cech and Jennifer look quite serious as they walk down the hallway. Jennifer holds a bunch of papers and folders, looking quite busy.

CECH

Introns, which I discovered, could  
be an important piece of the RNA  
puzzle.

JENNIFER

We're going to have to figure out  
its 3D structure.

CECH

(laughs)

You're so naive. If we had asked  
the National Health Institutes of  
Health to fund this, we'd be  
laughed out of this room.

INT. UNIV OF COLORADO BOULDER CHEMISTRY LAB - CONTINUOUS

Jennifer's arrival at the lab room is apparently a surprise for everyone. People all turn to her as she enters.

As Jennifer settles in the lab and starts to work, we slowly focus on one particular graduate student, JAMIE CATE (26). He's a quiet and unassuming student, always working in very end of the lab bench at the corner of the room.

Both of them walk towards the same desk in the lab to grab some falcon tubes. They exchange eye contact.

JAMIE

You must be Jennifer.

JENNIFER

I am. You are?

JAMIE

Jamie, a grad student here.

JENNIFER

Nice to meet you.

JAMIE

Same here.

(a beat)

What are you working on here?

JENNIFER

Cech doesn't think we can figure out RNA structure, so I decided to do exactly that.

JAMIE

How are you gonna do it?

JENNIFER

X-ray crystallography.

Jamie suddenly gets excited.

JAMIE

I actually have used X-ray crystallography to study the structure of proteins.

(a beat)

So if you don't mind, I can help you out.

CUT TO:

EXT. UNIV OF COLORADO BOULDER - NIGHT

Tom's car zooms past the heavy traffic. He arrives hurriedly in front of the chemistry building. He checks his watch.

It's 9pm already and Jennifer is still not out.

INT. UNIV OF COLORADO BOULDER CHEMISTRY LAB - NIGHT

We see Jennifer and Jamie working in the lab. Jennifer paces worriedly in the lab, waiting for an experiment to be done. Suddenly she realizes something is wrong.

JENNIFER

(yelling)

God damn it! This incubator is not working. Do you see the temperature in the incubator? It's 70 degrees. You've ruined the entire experiment.

Jamie is visibly shaking. He's never heard a female scientist yelling in a lab before.

JAMIE

I am sorry, let me take it out. I can stay here the entire night tonight to do it again.

JENNIFER

JUST TAKE IT OUT. Hurry!

JAMIE

This incubator seems to be broken.

She loses her temper after a full day of work. Jamie takes out a petri dish out of the incubator and Jennifer grabs it from him.

They are trying to grow crystals but the incubator is broken.

JENNIFER

Put it under the microscope!

Jennifer leans forward and peaks into the microscope. She expects the worst results. BUT...

JENNIFER (CONT'D)

WOW!

We see a shot of what Jennifer sees under the microscope. Strands of RNA in a beautifully grown crystal.

JENNIFER (CONT'D)  
That is beautiful.

She lets Jamie sees it too.

JAMIE  
Does that mean that to get the  
crystals to grow, we need higher  
temperature?

Jennifer and Jamie seem happy, surprised, and proud, as they should – they just made a big breakthrough.

Show a shot of the clock on the wall. It shows 12:05 AM.

JENNIFER  
Shit, Tom's supposed to pick me up.

JAMIE  
It's already 12:05.

JENNIFER  
What?

Beat. Jennifer doesn't know what to do.

JAMIE  
I can give you a ride home.

INT. JAMIE'S CAR - MOMENTS LATER

Jamie drives a white Toyota Camry. Jennifer sits pretty awkwardly in the passenger seat. Jennifer looks straight to the road. It's a short drive, but the silence in the car made it seem oddly awkward.

Jennifer peeks at Jamie, and Jamie at Jennifer. Neither of them wants the other to know they are trying to look at each other.

They pull up to an apartment building.

JENNIFER  
See you tomorrow.

JAMIE  
See you.

INT. TOM AND JENNIFER'S APARTMENT - CONTINUOUS

A nice and spacious apartment. We see the dinner table set up, but the food at one end is finished, and food on the other side is untouched. The candle is burning out.

Someone is playing an 80s song on an electric guitar. When Jennifer pushes open the door, the music stops.

Tom comes out of his room. He's in pajamas.

They don't hug or anything. Instead, Tom maintains distance.

TOM  
Who drove you back?

JENNIFER  
My coworker.

TOM  
Coworker... Ok, we need to talk.

JENNIFER  
Oh god, not this again.  
(a beat)  
You know what time it is?

Jennifer shrugs. She has no idea.

JENNIFER (CONT'D)  
Listen, I'm sorry I'm late, but we were in the middle of an experiment and we had to continue.

TOM  
You say this every day.

JENNIFER  
Seriously, we just made a breakthrough.

TOM  
I don't care! I waited for you in the car for almost an hour. You know I hate waiting for people.

Jennifer is shocked and in disbelief. She's known Tom since they were graduate students at Harvard. Tom's not like this.

JENNIFER  
Let me finish.



TOM

You've been coming back after  
midnight five days in a row.

Tom points at the dinner table set up in the living room.

TOM (CONT'D)

I've even made food for you. And  
what do you do in return?

JENNIFER

Tom...

TOM

(yelling)

YOU'RE ALWAYS IN THE LAB! You're  
not a student anymore.

(a beat)

START HAVING A LIFE. Like me.

Tom is more and more visibly angry. Jennifer also raises her  
voice.

JENNIFER

I'm always in the lab because I  
ACTUALLY DO SCIENCE. I live and  
breathe it. And you? You treat  
science as a 9-to-5 job. That's not  
how you do science.

TOM

We can't live together like this. I  
want to build a life with you,  
that's why we moved here, to  
Boulder.

JENNIFER

Not tonight Tom. That's enough.

Jennifer storms into a room. She slashes the door closed.

CUT TO:

MONTAGE - VARIOUS

A) INT. LAB - DAY: Jennifer and Jamie work closely together  
in the lab.

B) INT. DINING HALL - DAY: Jennifer and Jamie get lunch  
together, initially to discuss work.

C) INT. RESTAURANT - NIGHT: Jennifer and Jamie get dinner  
together.

C) INT. LAB - NIGHT: Jennifer and Jamie stay in the lab later and later.

D) INT. JAMIE'S CAR - NIGHT: Jamie drives Jennifer home every night. They talk more and more in the car.

CUT TO:

INT. UNIV OF COLORADO BOULDER CHEMISTRY LAB - DAY

Jennifer's lab has been transformed a news studio. With lights and tripods set up around the space, a local news anchor begins reporting.

NEWS ANCHOR

RNA's structure has been a mystery for scientists since the discovery of the molecule.

(beat)

But it's only recently that a team here at Boulder was able to capture the snapshot of the molecule.

Jennifer sits in front of a computer screen and points to a blurry image. From behind the cameras, arms crossed, Jamie, her husband, smiles with pride.

JENNIFER

We hope that our discovery will provide clues as to how we might be able to modify...

Jennifer's phone rings - interrupting the shot. She is annoyed by this interruption. Jamie steps out of the room to take the call on her behalf. Jennifer tries to regain her composure.

JENNIFER (CONT'D)

We hope that our discover will provide clues as to how we might be able to modify the ribozyme so that it can repair defective genes.

Before the news anchor can ask another question, Jamie bursts into the room again. He's distressed.

JAMIE

Jennifer! Your father...

(he switches to  
whispering)

He's not well, it's metastasized to the brain.

Close up on Jennifer's shocked face.

CUT TO:

INT. HOSPITAL IN HILO - DAY

Hospital room, all silent. Martin is resting on the bed and looking frail. Jennifer enters.

JENNIFER

Dad! I'm here.

She rushes to his side.

MARTIN

Oh Jennifer it's so nice to see you.

JENNIFER

(increasingly worried)  
Are you ok? I heard...

MARTIN

Oh don't worry about me Jen, it's not too bad.  
(struggles to sit up)  
How's Tom?

An obvious pause. Jennifer has to stop and think.

JENNIFER

We're fine.

MARTIN

I'm so glad. Tom seems like a great guy. Fun guy.

Jennifer has stories and feelings she wants to but can't tell dad.

MARTIN (CONT'D)

I heard work is going well for you?

JENNIFER

(voice quavering)  
It is.

MARTIN

Want to show me?

Jennifer nods. She's heartbroken. But she also knows that her dad is honestly interested.

She pulls out a color printout of the latest image of RNA molecule, and unrolls it. Martin smiles.

MARTIN (CONT'D)

Oh it looks like green fettuccini!

Both burst into laughter.

JENNIFER

It really does.

MARTIN

So what does this mean?

JENNIFER

Well, maybe there's a core of metals here that helps this RNA to fold up into this type of twist.

MARTIN

Hmm... interesting. Why would that be important?

JENNIFER

(pauses, and smiles)

Because there is a lot less chemical complexity to RNA, and the challenge is to think about how does it fold into a unique shape.

Martin nods as if he understands everything his daughter has just said. He gently touches Jennifer's face.

MARTIN

I'm so proud of you, Jen. Look how far you've come. I'm so proud of you.

They embrace.

CUT TO:

EXT. WAIPI'O VALLEY, HILO - DAY

A wide shot of the cliffs in Waipi'o Valley and the lush wilderness. Rivers wind through the green terrain. Small waterfalls are scattered throughout.

Somber music plays as we see Jennifer and Lisa (Jennifer's childhood friend) hike slowly to the very end of the valley near the cliff. Jennifer carries a cremation urn, both hands holding it. It looks like a funeral procession, a march. Jennifer is ahead, flanked by Jamie and Lisa.

They reach the cliff. Jennifer scatters the ashes in the pacific.

JENNIFER

Love you, Dad. I will keep making you proud.

A Hawaiian hawk soars overhead.

CUT TO:

INT. UNIV OF COLORADO BOULDER CHEMISTRY LAB - NIGHT

We see Jennifer in the lab late at night. She's conducting an experiment. While she's waiting for it to be done, she turns and glances over the wall next to her desk.

On the wall are pictures of her and Tom: their days at Harvard, their wedding, their honeymoon, and Tom with a guitar. Jennifer is reflective, her face calm.

The lab is all silent, except we can hear the regular and rhythmic movements from a machine shaking a beaker with chemical solutions in it.

Jennifer approaches the wall, and slowly takes down all of her pictures with Tom.

INT. UNIV OF COLORADO BOULDER HALLWAY - CONTINUOUS

Jamie is also still in the lab. Just as he's about to enter the lab, he sees through the window on the door what Jennifer's doing.

A beat. We see Jamie's face concerned, but also loving and caring.

INT. UNIV OF COLORADO BOULDER CHEMISTRY LAB - CONTINUOUS

Jamie finally enters the room gently after Jennifer sat down. Jennifer sees Jamie and begins to cry.

They embrace.

JAMIE

It's all going going to be ok. I'm here for you.

A close closeup facing Jennifer. We see that she's no longer wearing a ring. She looks exhausted, both physically and mentally.

Suddenly, the machine that's running the experiment beeps. The experiment is over. Jennifer quickly runs there.

Jamie stands where they were. A loving smile.

CUT TO:

EXT. UNIV OF COLORADO BOULDER - DAY

Jennifer and Jamie take a stroll on campus. Doves of undergraduate students pass by. They're holding books, binders, and papers.

JENNIFER

I was just like them, only 8 years ago.

JAMIE

We were all kids once.

JENNIFER

I got a call from Berkeley yesterday. They offered me a position.

JAMIE

What did you tell them?

JENNIFER

I said I wasn't sure, need to think about it.

JAMIE

(surprised)

What? You should call them back.

Jamie realizes that this could be a big decision. He stops, turns to Jennifer, and holds her on her shoulders.

JAMIE (CONT'D)

Berkeley is nice. You definitely should call them back.

CUT TO:

EXT. UC BERKELEY CAMPUS - DAY

Wide shot of the UC Berkeley campus. Sather Tower stands tall among a sprawling suburban campus. The ring of the bells of Sather Tower can be heard from all over campus.

INT. FREE SPEECH MOVEMENT CAFE - DAY

It's a blustery spring day. We see Jennifer is sitting with A WOMAN at a stone table in the Free Speech Movement Cafe, a soup-and-salad place near the entrance of one of the undergraduate libraries.

The WOMAN is JILLIAN (39). A microbiologist.

JILLIAN  
Have you heard of CRISPR?

JENNIFER  
You mean crisper?

JILLIAN  
No. CRISPR: clustered regularly  
interspaced short palindromic  
repeats.

It's a mouthful, even for Jillian.

She now pulls out print outs of two scientific papers. For outsiders, it feels like a secret business deal being made, or spies exchanging information.

Zoom into the papers. We see tables listing data lasting pages long with sequences of "a", "t", "g", and "c".

Jennifer leans forward, curious.

JILLIAN (CONT'D)  
Look at these sequences!

Jillian points her finger at the sequences on the paper. Her finger almost shaking. She's excited.

JILLIAN (CONT'D)  
It's like they are diversifying so  
fast in response to something.  
(a beat)  
What can be causing these strange  
clusters of DNA sequences, and how  
did they actually work?

Jillian is so passionate about this subject that she's speaking too fast for Jennifer to understand.

JENNIFER  
Slow down a bit.

JILLIAN

So the bacteria with CRISPR spacer sequences seem to be immune from infection by a virus that had the same sequence.

JENNIFER

But the bacteria without the spacer would still get infected?

JILLIAN

Precisely!

JENNIFER

Do we know how it works?

JILLIAN

No one knows. People think it's through RNA inference.

(beat)

And that's why I came to you.

JENNIFER

If it works through RNA inference, then you're at the right place. But if it's not, we have nobody working on it right now.

CUT TO:

INT. JENNIFER'S LAB - UC BERKELEY - DAY

We see Jennifer's lab at UC Berkeley. The lab seems to have a much more expansive space than the one at University of Colorado Boulder.

We also notice that Jennifer's team has grown. We see the following new post-docs or PhD students in Jennifer's lab:

BLAKE WIEDENHEFT (29), MARTIN JINEK (27), RACHEL HAURWITZ (26), and SAM STERNBERG (26). All smart people.

We see that they are all in a meeting, where one by one, the post-docs or the PhD students present their latest findings in a meeting room.

Jennifer sits at the very end of the long table in a seminar-style room. She listens attentively.

BLAKE

(presenting)

I've been studying the Cas1 enzyme.



CRISPR-associated (Cas) enzymes allow bacteria to cut out virus DNA and recognize it in the future. Cas1 is just one of many Cas enzymes.

BLAKE (CONT'D)

I have isolated the Cas1 gene from bacteria and then clone it. I was then able to crystallize it. We discovered that Cas1 has a distinct fold. We think it's through this mechanism that bacteria cleave segments of the virus DNA and include it in their CRISPR array, becoming immune to the virus.

After Blake, Rachel walks to the front of the room.

RACHEL

Martin and I have been working on Cas6. We realized that its role is to latch on to the long RNA sequences made by CRISPR, and slicing them into shorter ones. This allows the bacteria to precisely attack the viruses.

JENNIFER

What's the point of this?

RACHEL

We could use Cas6 and other Cas enzymes as a medical tool for treatment and diagnosis. We can even start a company based on that.

Jennifer nods approvingly. She's proud of Rachel's ability to answer big picture questions.

RACHEL (CONT'D)

We have a paper submitted to *Nature*. But they said it's not important enough to be a featured as an "article" in the journal, so they might publish it as a "report".

Jennifer suddenly stands up. She's been calm and scientific this entire time, going through all the presentations. But the fact that *Nature* might only publish her lab's paper as a "report" is not acceptable to her.

JENNIFER

No that's not ok. Because a report means it's not as important.

Jennifer is almost jumping up and down. She's mad.

RACHEL

But it's *Nature*. It's the top journal.

JENNIFER

I'm going to talk to the editor. This is a big advance and we can't dumb down its importance. Just watch me.

Blake, Martin, Rachel, and Sam all look surprised and amused that their mentor and leader has lost her temper, but proud that Jennifer would advocate for them and for herself.

CUT TO:

INT. CONFERENCE ROOM - PUERTO RICO HOTEL - DAY

It's a biology conference at a four-star hotel in Puerto Rico. We see all attendees dressed in professional attire and wearing lanyards and name tags. Jennifer is with her lab.

A big and warm applause to A MYSTERIOUS WOMAN (43) walking up the stage to present. She looks far more elegant than other guests, and the audience seem to be dazzled by her style.

WOMAN

We have not figured out what happens to the tracrRNA after it helps create a crRNA. We think it could be that the two could fuse together when they need to guide the Cas protein to cut up invading viruses.

A MAN from the audience interrupts to ask a question.

MAN FROM AUDIENCE

Do the three stay together as a complex?

The WOMAN who's presenting is annoyed by the question.

WOMAN

Haha great question. We think that the structure of the Cas protein is important to be figured out.

The WOMAN is clearly deflecting the question. She doesn't want to answer it.

She's laughing it through, but we can tell in her tone that she has a deep sense of competitiveness. She doesn't want the man from audience to know too much.

ANNOUNCER

Next up, we have Dr. Jennifer  
Doudna from UC Berkeley.

It's Jennifer's turn to present next. As she's walking up the podium, she passes by the woman. They pretend they don't know each other, but the audience get a sense that they do, and their relationship might be important later.

We see a glimpse of Jennifer also presenting her findings at the conference.

INT. BALLROOM - PUERTO RICO HOTEL - LATER

A ballroom of the hotel. There are cocktail tables set up for guests to talk around. It's loud and crowded. People are talking to each other. It's like a party.

JOHN (42) walks up to Jennifer. He's the man from the audience earlier during the presentations. Turn out, he's Jennifer's old friend.

JOHN

Jennifer, your presentation was  
amazing.

JENNIFER

Thanks.

JOHN

I was wondering if you could  
elaborate on the structure of Cas6  
and how it governs its functions?

Jennifer isn't interested in answering his question. Instead, she's looking at somebody she wants to get to know.

JENNIFER

Wait, do you know the woman sitting  
right there? You asked her a  
question before.

Jennifer is cautious. Instead of pointing, she's gesturing using her chin and her eyes.

JOHN

Her?

John points to THE MYSTERIOUS WOMAN at a table in the corner sitting by herself.

JOHN (CONT'D)  
(whispering)  
That's Emmanuelle Charpentier, you  
know of her, right?

John looks back at Jennifer. She shakes her head.

JENNIFER  
She's the one who did tracrRNA?

JOHN  
Precisely. She discovered the role  
of tracrRNA. She basically figured  
out that it directs the creation of  
crRNAs. And the paper she recently  
published...

JENNIFER  
The one in *Nature*?

Jennifer, bold, starts to walk towards Emmanuelle. John stops her.

JOHN  
Before you go...

JENNIFER  
What?

JOHN  
(starts to whisper)  
You need to know something. You'll  
definitely bond with her  
scientifically. But don't try to be  
her friend.

JENNIFER  
What do you mean?

JOHN  
She's a woman of many different  
cities, many labs, many degrees and  
postdoc programs, but few roots and  
commitments. She's willing to pack  
up her pipettes and move anytime,  
which is a quality you will like.

They both look at Emmanuelle.

JOHN (CONT'D)

But even though she doesn't seem to be competitive, she is. Don't let that trick you.

Jennifer nods and heads towards Emmanuelle's table.

JOHN (CONT'D)

Emmanuelle, let me introduce you to Jennifer.

Emmanuelle stands up a bit awkwardly, feigning shyness. She looks at Jennifer's name tag, smiles. This is who she's been waiting for.

John leaves. Jennifer and Emmanuelle shake hands.

JENNIFER

It's so nice to meet you finally. I've read your paper and I believe we work on similar things.

EMMANUELLE

Similar things, to say the least.

JENNIFER

Haha yes.  
(slight pause)  
How does a Parisian end up attending a scientific conference in Puerto Rico rather than vacationing here?

EMMANUELLE

It's not too bad.

A long silence. These two are not great at small talk.

EMMANUELLE (CONT'D)

We recently discovered the role of Cas9 but we need to figure out exactly how it works.

Jennifer nods.

JENNIFER

I know. But I was wondering...

The two women launch into an animated conversation.

CUT TO:

EXT. OLD SAN JUAN STREETS - PUERTO RICO - EVENING

Jennifer and Emmanuelle stroll along the cobble-stone streets of old San Juan. They now seem like old friends. Cars zoom past them. They arrive at less busy parts of the city.

JENNIFER

This reminds me of where I grew up, in Hawaii. I was born and raised there, but never felt like I belong. I felt like a foreigner in my own hometown.

EMMANUELLE

Sometimes, you can never be completely at home, but that can drive you, make you want to do great things.

JENNIFER

Where have you lived?

EMMANUELLE

(slight laugh)

Oh a lot of places: Paris, Berlin, Warsaw...

(a beat)

I like moving. It's destabilizing, but it can be good. It assures that you never get stuck, and you can always start fresh.

JENNIFER

That must be tough, but what an interesting way to work.

There's a moment of silence. Jennifer steps back, impressed.

EMMANUELLE

I think that's who I was able to make progress in CRISPR.

JENNIFER

So you've understood its role?

EMMANUELLE

It seems that tracrRNA needs to continue to be associated with the crRNA, but there are details we don't completely understand.

JENNIFER

We need to figure out exactly how it works. What's the mechanism it uses to cut DNA. Right?

Emmanuelle smiles. She's taken by Jennifer's intensity.

EMMANUELLE

I think it'll be fun to work with you.

CUT TO:

INT. JENNIFER'S LAB - UC BERKELEY - DAY

Jennifer comes into the lab with boxes. We see her putting up two new clocks.

Below the first new clock, there's a label that says "Stockholm, Sweden".

Below the second new clock, there's a label that says "Vienna, Austria".

Jennifer now puts on a label below the original clock. "California, USA".

Jamie comes around and sees this. Laughs out loud.

JAMIE

What are you doing? Is this Model UN now?

JENNIFER

Haha. It's because Emmanuelle is working in Stockholm, Krzysztof is working in Vienna, and we're in California.

(laughs)

Actually you're right, kinda like Model UN.

We pan around the room to see Martin Jinek is conducting experiments. He has a laptop open with Skype. KRZYSZTOF CHYLINSKI (30) is on mute but Jinek and Chylinski occasionally both unmute to talk to each other.

We zoom into the three clocks on the wall. It's 10:00 AM California time, 7:00 PM Stockholm time, and 7:00 PM Vienna time.

FADE TO:

INT. JENNIFER'S LAB - UC BERKELEY - NIGHT

We zoom into the three clocks on the wall. It's 10:00 AM California time, 8:30 AM Stockholm time, and 8:30 AM Vienna time.

MARTIN  
This is not working.

JENNIFER  
What's going on?

MARTIN  
The CRISPR-Cas9 system is not chopping up DNA in the test tube.

JENNIFER  
What's in the reaction?

MARTIN  
Just Cas9 and crRNA. Something's missing.

JENNIFER  
Yea that's weird.

Jennifer paces slowly throughout the lab space. She's looking for an answer.

Suddenly, we hear that another person has joined the Skype call. It's Emmanuelle.

Emmanuelle shows her face, it's morning time for her. We can see in the video that sun is shining on her face and her black hair.

Suddenly, Jennifer jumps up, yells at Martin.

JENNIFER (CONT'D)  
THROW tracrRNA INTO THE TEST-TUBE!

INT. JENNIFER'S LAB - UC BERKELEY - LATER

We see Martin pointing at the computer screen, excited and in disbelief. Jennifer runs to Martin, and SCREAMS. We hear Emmanuelle screaming on Skype too.

Jennifer, Martin, and Krzysztof all embrace each other.

They've successfully gotten CRISPR-Cas9 to work.

CUT TO:



INT. JENNIFER'S HOUSE - NIGHT

We're in Jennifer's house near Berkeley. The kitchen is spacious and organized. Jennifer and her son ANDY (12) make spaghetti for dinner.

Closeup of the pot of the boiling water and the swirls in the water.

FLASHBACK TO:

INT. HILO HIGH SCHOOL CLASSROOM - DAY

Young Jennifer in Ms. Wong's classroom operating a microscope. They collected salmon sperms and Jennifer put a petri dish under the microscope. We see the salmon DNA under the microscope.

RETURN TO:

INT. JENNIFER'S HOUSE - MOMENTS LATER

The swirls in the boiling water remind Jennifer of the salmon sperm. She laughs.

ANDY

Mom?

JENNIFER

We found this protein, an enzyme called Cas9. It can be programmed to fight viruses and cut them up. It's so incredible.

Andy is fascinated. The water in the pot begins to boil, steam is coming out. Jennifer puts in the dry spaghetti from a jar. The spaghetti moves in circular motion with the swirling water.

ANDY

That's awesome.

JENNIFER

Yea it really is.

ANDY

Wait but how does it cut viruses? Does it have its own scissors?

JENNIFER

(amused)  
Well sorta.

Jennifer pauses, determining the best way to explain her work to her son.

JENNIFER (CONT'D)

Over billions of years, bacteria evolved this totally weird way to protect themselves against viruses. And it was adaptable. Every time a new virus emerged, it learned how to recognize it and beat it back.

Jamie enters the kitchen. He kisses Jennifer lovingly.

JAMIE

What's happening?

JENNIFER

We're just making pasta.

JAMIE

How's work?

JENNIFER

You can't believe it. We made CRISPR-Cas9 to work!

Jamie is overjoyed when he heard this. He hugs Jennifer.

JAMIE

Finally, huh?

JENNIFER

We showed that single-guided RNA works today. So everything we need is here.

JAMIE

You know that you're changing the world, right?

Jamie exchanges a look with his son. Jennifer smiles. They embrace again.

Jamie suddenly pauses. Thinks for a bit.

JAMIE (CONT'D)

You have to patent. Tell Martin Jinek to write up in the lab notebook everything that he's done and witnessed in the experiment.

CUT TO:

INT. JENNIFER'S LAB - UC BERKELEY - NIGHT

It's past 9 PM. Jennifer runs back to the lab. Jinek, Sam, and Rachel are still there.

JENNIFER

Martin! Write everything down. Your experiment, how it worked... We need to document everything.

Jennifer sees Sam and Rachel.

JENNIFER (CONT'D)

You guys need to sign the notebook. EVERY PAGE!

Rachel look confused.

RACHEL

Where do we sign?

JAMIE

Lab notebooks have witness signature lines at the bottom of each page, meant to document important advances.

RACHEL

Oh what's what they're for.

Sam and Rachel look surprised, and nervous. They've never done it before, and they realize that if Jennifer is yelling at them to sign something, something important has happened.

INT. JENNIFER'S OFFICE - UC BERKELEY - EVENING

The sun is just setting. The orange gold light beams into the all glass windows of Jennifer's office. The entire office has the color of the sunset.

The glass board still have whiteboard notes written on it. We zoom into a section on the glass board. It's a short to-do list. It reads:

- Draft paper. [check]
- Wait for approval from *Science* editors. [check]
- *Science* journal final submission. []

The last item is circled in red.

Next to the to-do list, we see drawings of CRISPR-Cas9 structure, experiment designs, and other schematics.

Emmanuelle looks exhausted, but surprisingly calm. She looks out at the San Francisco Bay, and just stares outside.

Jennifer looks at Emmanuelle and hesitates to even break this silence.

JENNIFER

Have you realized that it's only been a little more than a year since we met in Puerto Rico?

EMMANUELLE

(nods)  
14 months to be exact.  
(a beat)  
It's been a wild ride.

JENNIFER

What are you doing next?

EMMANUELLE

Going back to the lab again. I want to study microbes closer.

JENNIFER

You don't want to continue with this?

A beat. Emmanuelle had to think.

EMMANUELLE

No. We've made the discovery, and now it's becoming a tool. A tool for genetic editing.

JENNIFER

You want to go back to basic science?

EMMANUELLE

Exactly.

JENNIFER

Where are you going to do that?

EMMANUELLE

I'm thinking of moving to the Max Plank Institute. In Berlin.

Jennifer nods. A beat. She moves closer to Emmanuelle, who's looking out of the window.

JENNIFER

Have you ever thought of settling down? Just for a bit.

EMMANUELLE

What do you mean?

JENNIFER

Like marrying... having a kid...

Emmanuelle shakes her head, but still looking at the sunset over the San Francisco Bay through the window.

EMMANUELLE

No, not really. I like this.

A close up of Emmanuelle's face to show the wrinkles of her face. Her face expressionless. Her eyes fixated outside, not making eye contact with Jennifer.

CUT TO:

INT. CHEZ PANISSE RESTAURANT - LATER

It's a fancy Californian restaurant near Berkeley. Jennifer and her lab arriving to the busy downstairs dining area. When Jennifer arrives, she goes up to the HOSTESS.

HOSTESS

How can I help you?

JENNIFER

Table for 6?

Jennifer turns to check out the dining area. The downstairs area is upscale and fine dining. We see most of the guests dressed in nice shirts or polos. It seems like a place where important people in the Bay Area get dinner.

JENNIFER (CONT'D)

Could we get a table somewhere on this floor?

The hostess checks her table map on her desk. She looks out at the dining area, which is packed. She shakes her head.

HOSTESS

Unfortunately, since you don't have a reservation, we're all full on this floor. But we can get you a table upstairs. It's not fine dining, but it's very cozy.



JENNIFER (CONT'D)  
Our discovery has commercial  
potentials.

EMMANUELLE  
Surf on the good wave, Jennifer!  
Note everything is a competition.

Emmanuelle says that with her typical French accent. She's French, not as worked up as Jennifer.

JENNIFER  
No, I mean seriously.

There's a certain coolness in this brief exchange between Jennifer and Emmanuelle. Both of them are serious, but everyone else laughs at Emmanuelle's light jab at Jennifer's competitiveness.

RACHEL  
What's next for us?

Everyone looks towards Jennifer. She takes a big bite into her grilled pork loin.

All silence. People wait for Jennifer.

JENNIFER  
Making it work for editing human  
genes.  
(a beat)  
We all know it's going to be a race  
to do it in human cells. It's going  
to be a sprint to get there first.

Jennifer suddenly becomes very serious. It no longer feels like a celebration. It's more like a war mobilization. Jennifer turns to Martin Jinek.

JENNIFER (CONT'D)  
You need to make this your absolute  
priority.

MARTIN  
Why?

JENNIFER  
Because if Cas9 can be shown to  
edit human genes, the world will  
change.

MARTIN  
But we're not genome editors.

For the first time, Martin contradicts Jennifer.

MARTIN (CONT'D)

We're biochemists. We're good at testing things in a test tube, not in humans or human cells.

(a beat)

There are so many other labs focused on this. We have to reinvent the wheel.

CUT TO:

INT. JENNIFER'S LAB - UC BERKELEY - DAY

As Jennifer comes into the lab on the next day, we see an email pop up on her computer. It's from GEORGE CHURCH (42).

It reads:

*Jennifer and Emmanuelle,*

*Just a quick note to say how inspiring and helpful is your CRISPR paper in Science.*

*My lab is trying to apply some of the insights from your study to genome engineering in human cells.*

*I hope that we can stay in touch as we make progress.*

*Best wishes, George*

Jennifer reads it out loud so Martin Jinek can hear it.

JENNIFER

I told you.

MARTIN

Who is it from?

JENNIFER

George Church. I met him once while at Harvard.

MARTIN

Don't you think it's weird for him to tell you that he's also working on applying CRISPR on human gene editing?



JENNIFER

That's typical of him. I'm not worried. But like I said, WE NEED TO HURRY.

CUT TO:

INT. FENG ZHANG LAB - MIT - DAY

FENG ZHANG (32) is working in his spacious office at MIT with a view of Charles River. A STUDENT (26) sits across from him.

On the wall behind his desk, we see a framed magazine page. It says "Feng Zhang, Ph.D., Forbes 30 under 30".

On his desk, we see a paper printed out. It's Jennifer and Emmanuelle's paper in *Science*.

ZHANG

Don't tell George.

STUDENT

But he's your advisor, isn't he?

ZHANG

Yea, but still, let's keep this confidential.

STUDENT

Will George be mad?

ZHANG

Probably.

CUT TO:

INT. JENNIFER'S LAB - UC BERKELEY - DAY

MARTIN

Did you hear about Zhang's work as well?

JENNIFER

Don't worry about it. Keep doing your work. We want to publish our results in human cells as soon as we can.

MARTIN

But what's the point of publishing anything if the data is incomplete. It's not worth it.

JENNIFER

We have to publish this, even if it's not quite the story we wish we could tell.

(a beat)

We have to put out the best story we can put out, with the data we already have.

MARTIN

But...

JENNIFER

(yells)

Let me finish!

A beat. Jennifer tries to calm down and lower her voice.

JENNIFER (CONT'D)

We don't have time, Martin. These paper, George's, Zhang's, they're all coming out soon.

(sighs)

We HAVE TO publish.

MARTIN

We're gonna look like amateurs genome editing.

JENNIFER

But WE ARE. And it's ok. We're biochemists, not geneticists. People are not going to think badly of us.

CUT TO:

INT. FENG ZHANG LAB - MIT - DAY

We see Zhang typing up an email.

It reads:

*Dear Dr. Doudna,*

*Greetings from Boston!*

*I'm a professor at MIT and have been working on developing applications based on the CRISPR system. Our lab recently completed a set of studies applying the CRISPR system to carry out genome editing of mammalian cells. The study was recently accepted by Science and it'll be published online tomorrow. I've attached a copy of our paper for your review.*

*The Cas9 system is very powerful and I would love to talk with you sometime.*

*Best wishes,  
Feng Zhang, Ph.D.  
Core Member, Broad Institute of MIT and Harvard*

CUT TO:

INT. JENNIFER'S LAB - UC BERKELEY - DAY

We see a desk in Jennifer's lab. There are three papers.

1) "Multiplex Genome Engineering Using CRISPR/Cas Systems." By Feng Zhang and others. Published on January 3, 2013.

2) "RNA-Guided Human Genome Engineering via Cas9." By George Church and others. Published on January 3, 2013.

And,

3) "RNA-programmed genome editing in human cells." By Jennifer Doudna and others. Published on January 29, 2013.

MARTIN

We all published at the same time?

JENNIFER

Shit. We're in trouble.

CUT TO:

INT. DEPOSITION ROOM - DAY

It's a long conference table. It's so different from a lab or a lab office. It's just a plain room.

We see Jennifer Doudna, George Church, and Feng Zhang all sit apart from each other. There's a LAWYER wearing an uptight suit in the middle.

Nobody is smiling. It's intense.

LAWYER

Dr. Church, since when did you know that your advisee, Dr. Zhang, has also been working on the same technology?

CHURCH

Only a month ago. By then we already submitted the paper.

LAWYER

And Dr. Zhang, how long have you been working on CRISPR?

ZHANG

For a year.

CHURCH

(to Zhang)

You betrayed me!

LAWYER

Dr. Zhang, why didn't you tell your advisor about it?

ZHANG

Because he's at Harvard, and I'm at MIT. It's two institutions and two separate labs.

The lawyer turns to Jennifer.

LAWYER

And Dr. Doudna. You argued that your discovery with Emmanuelle Charpentier laid the foundation, and the human cell experiments were obvious after your discovery?

JENNIFER

Yes.

ZHANG

But what Jennifer has been doing is a biochemistry experiment in a test tube!

(a beat)

Showing that it cleaves DNA in a test tube is not an advance in terms of gene editing.

JENNIFER

It's very well known how you could tag proteins with nuclear localization signals to get them to go into the nucleus, which is what we did with Cas9.

ZHANG

No, but in gene editing, you have to know whether or not it cleaves in cells. I always work directly in cells, not *in vitro*.

(MORE)

ZHANG (CONT'D)

Because the environment in cells is different than in a biochemistry experiment.

JENNIFER

It was very easy once you knew the components. A first-year grad student would be able to do it.

TO BE CONTINUED... DECEMBER 22, 2022