

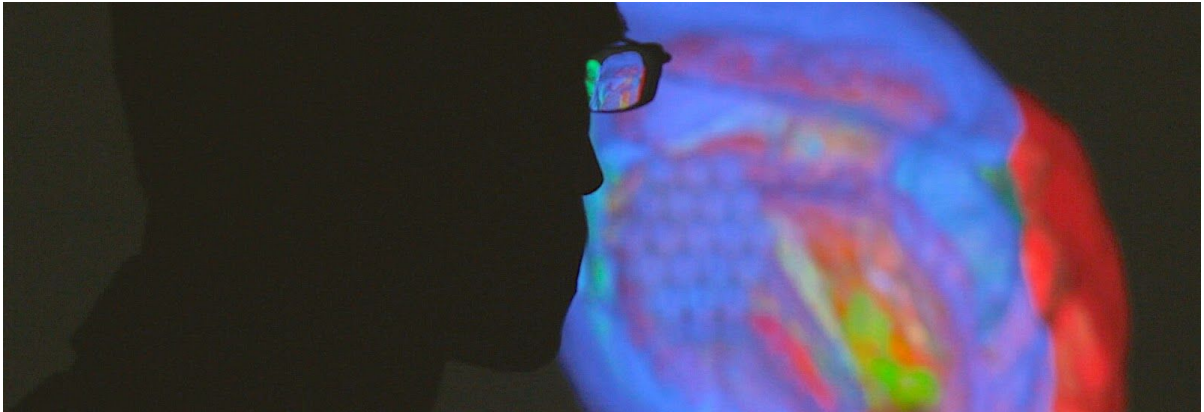
IN SILICO

Presented by [Sandbox Films](#)

Directed by Noah Hutton

Produced by Kellen Quinn, Taylor Hess, Jesse Miller

World Premiere - DOC NYC 2020



*"This is a bold and insightful film, a film that has the courage to change course of its basic hopes and beliefs. Noah Hutton, the filmmaker, realizes he has been carried away by a "sexy" TED Talk of a charismatic scientist with a big ego, and re-adjusts his perspectives after years of covering the research. I have never seen anything like this in films." - **Werner Herzog***

LOGLINE

The story of a simulated mind as polarizing as its creator.

SYNOPSIS

A young filmmaker sets out to document a brilliant neuroscientist who has become frustrated with his field's status quo. With time elapsing and millions of dollars on the line, *In Silico* explores an audacious 10-year quest to simulate the entire human brain on supercomputers. Along the way, it reveals the profound beauty of tiny mistakes and bold predictions — a controversial space where scientific process meets ego, and where the lines between objectivity and ambition blur.

DIRECTOR'S STATEMENT BY NOAH HUTTON

I started making this film soon after I had graduated from college, where I studied neuroscience. I watched Henry Markram's TED talk online, and had a feeling that his ten year quest to simulate the human brain could make for a natural longitudinal documentary timeline. At age 22, ten years both felt like long enough for anything to happen but also soon enough that I could imagine actually finishing the film someday. And so I got in touch with Markram, got access, and began the journey, wide-eyed and dazzled by the early simulations coming out of his Swiss-based Blue Brain Project. I started making yearly trips, determined to track the progress of the scientist who believed he could build a human brain on supercomputers.

In the first two years of working on the film, I focused on Markram and the Blue Brain Project exclusively; it was only after a screening at a conference organized by Google where scientists in the audience peppered me with critical questions that I came to see the urgent need to expand this story beyond its singular focus. This led to some of the more contentious moments of filmmaking I've experienced thus far in my career, as certain scientists bristled at my questions, refused to participate due to other people I've featured in the film, or asked to keep their statements private until the final film is released. Even now, subjects of the film are unhappy with the way their work has been portrayed and have sent me threatening emails. It's been interesting to see scientists react so passionately to a film that I believe takes a very measured critical stance, seeking not to "take down" any one person or project but rather to give an engaged, critical assessment without any positivist, PR-gloss.

In pop-science articles and some other documentary films, I believe that science is too often portrayed as a monolithic, voice-of-god force issuing objective truths, and experts are not challenged with critical objections to their hypotheses. I wanted to model for our audience a way to engage with science that uses an ethically-guided scientific method itself as a form of journalism, confronting the unknown with an openness and sharp attunement to the range of incoming data, in turn fostering a critical approach for our audience members to use in the future when they confront overhyped science.

Sometimes a monolithic truth does emerge, such as the truth of climate change. In neuroscience, though, I believe it's important to combine a call for continued research with an acknowledgement that debates rage on about the best methods and the established truths. And even more importantly, I believe it's crucial to raise awareness about the dubious private and military-sector appropriations of the work, with all their ethical and moral implications, creating a space for our audiences to engage with these issues. I want to make sure this debate is accessible to the general public, whose taxpayer dollars and-- in many cases-- eventual mental health depends on it. And I'm willing to sacrifice popularity among certain of my subjects and their allies for the orthodoxy of maintaining a journalistic rigor and critical approach to the topic.

KEY CREW

NOAH HUTTON (Director, Cinematographer, Editor, Composer) directed, edited, and scored the award-winning documentary features *Deep Time* (SXSW 2015) and *Crude Independence* (SXSW 2009). In 2020, he wrote and directed the sci-fi feature *Lapsis*, which premiered in the narrative feature competition at SXSW 2020 and was acquired by Film Movement for U.S. theatrical release in early 2021.

KELLEN QUINN (Producer) is an independent producer whose credits include Garrett Bradley's *Time* (Sundance 2020 winner of Best Director, US Documentary Competition), Luke Lorentzen's *Midnight Family* (shortlisted for Documentary Feature Oscar; Sundance 2019 winner of Special Jury Award for Cinematography, US Documentary Competition), Daniel Hymanson's *So Late So Soon* (True/False 2020) and Viktor Jakovleski's *Brimstone & Glory* (True/False 2017; aired on POV). Kellen was selected for DOC NYC's 40 Under 40 class in 2020. In 2017 and 2018, he participated in the Sundance Documentary Creative Producing Lab and Fellowship. In 2016, he was among six producers selected for Impact Partners' Documentary Producers Fellowship. With Luke Lorentzen, Kellen is a co-founder of the independent production company Hedgehog Films.

TAYLOR HESS (Producer) is a filmmaker, journalist, and contributing editor for *Filmmaker Magazine*. She has directed and produced for ESPN, *The Atlantic* and Netflix. She directed and produced the award-winning ESPN 30 for 30 short documentary *Mack Wrestles* (SXSW 2019). The first two narrative features she produced were selected to premiere at SXSW in 2020 — *Lapsis* by Noah Hutton and *The Surrogate* by Jeremy Hersh. Taylor has worked at Vox, Jigsaw Productions, Part 2 Pictures, The Independent Filmmaker Project (IFP), and Scott Rudin Productions. She is a graduate from New York University's Tisch School of the Arts and the Columbia University Graduate School of Journalism.

JESSE MILLER (Producer) is an independent producer and educator based in New York City. He produced the narrative feature film *Lapsis*, which premiered in competition at SXSW in 2020, and co-produced the award-winning documentary feature *Deep Time* (SXSW 2015). He has also worked on the Amazon web series *Becoming Jiff* (Samuel Goldwyn Films), a short film for the Rock and Roll Hall of Fame directed by Jonathan Demme, and the feature film *The Last* (2019) among other projects.

GREG BOUSTEAD (Executive Producer) founded Sandbox Films to tell more artful and inclusive stories about science. Greg oversees all aspects of the company — from editorial direction and on-location production to general strategy and greenlighting new projects. He's played key roles on over 10 feature-length documentaries — including as executive producer for *The Most Unknown* (co-produced with VICE, and acquired by Netflix); *Human Nature* (which premiered at SXSW); and *Fireball*, a documentary directed by Werner Herzog. Greg has spent his career telling creative stories about science. Previously, he was editor of the magazine SEED, and

producer for the World Science Festival. In 2019, Greg was named a finalist for the National Science Academy's Communication Award.

JESSICA HARROP (Executive Producer) is an Emmy-nominated documentary filmmaker who has dedicated her career to inspiring passion about science through film. She runs development and production for Sandbox Films, sharing responsibility for all project decisions and company strategy and acting as an executive producer for Sandbox Films documentaries. Jessica has produced content for a variety of outlets including Netflix, Showtime, Discovery, National Geographic, and PBS. Her credits include the Netflix documentary series Follow This, James Cameron's Emmy Award-winning series Years of Living Dangerously, Bill Nye Saves the World, and First in Human. She holds a degree in ecology and evolutionary biology and a Certificate in Theater from Princeton University, where she has been co-teaching an undergraduate film course on communicating climate change.

ABOUT HENRY MARKRAM / BLUE BRAIN PROJECT

Henry Markram was born in South Africa in 1962 and went on to earn a PhD in Neurobiology from the Weizmann Institute of Science in Israel in 1991. Before he began developing the Blue Brain Project, Markram was best known for his painstaking studies of cellular connectivity, for which he achieved international acclaim in the 1990s. He trained under Dr. Bert Sakmann, who won a Nobel Prize for pioneering a new way to record from an individual brain cell, or neuron.

Markram moved to the Ecole Polytechnique Fédérale de Lausanne (EPFL) in 2002 and became a full professor, continuing his research into how neurons communicate with each other in the brain. But, partly inspired by his frustration as the father of an autistic son, he soon became fed up with the status quo of incremental research, and wanted to accelerate a new way of doing neuroscience to perhaps one day find cures for his son's autism.

In 2005, he launched the Blue Brain Project, an attempt to digitally recreate the brain on supercomputers, hoping to understand its mysteries by trying to rebuild it piece by piece in a simulation. In 2008, he famously gave a TED talk where he declared that the Blue Brain Project could simulate an entire human brain within ten years.

After years of work and preparation, the European Union awarded 1 billion Euros in 2013 to a team led by Markram to scale up these efforts into what became known as the Human Brain Project, uniting labs all across Europe under Markram's vision. Markram again claimed that the project would create a simulation of the entire human brain on a supercomputer within a decade, revolutionising the treatment of Alzheimer's disease and other brain disorders. Less than two years into it, however, the project was recognised to be mismanaged and its claims overblown, and after an open letter signed by over 800 neuroscientists prompted a mediation process and mired the project in controversy, Markram was asked to step down from his leadership role at the Human Brain Project.

He now continues on in Geneva as the director of the Blue Brain Project, his original vision to simulate the brain, funded by the Swiss government, even as the Human Brain Project, under new leadership, has shifted its priorities and goals away from simulating the human brain. Markram continues to believe that simulation is the best path to understanding the mysteries of the brain, and continues to win funding from the Swiss government to support the Blue Brain Project, which has, as of 2020, simulated only part of a mouse brain.

MARKRAM & BLUE BRAIN PROJECT IN THE MEDIA:

- Markram's 2008 TED talk:
https://www.ted.com/talks/henry_markram_a_brain_in_a_supercomputer?language=en
- NYT article from 2013 about the launch of the Human Brain Project:
<https://www.nytimes.com/2013/03/19/science/bringing-a-virtual-brain-to-life.html>
- NYT article from 2014 about the open letter against the Human Brain Project:
<https://www.nytimes.com/2014/07/09/science/european-effort-for-computer-simulated-brain-draws-fire.html>
- THE ATLANTIC article by Ed Yong published in 2019 that evaluated Markram's controversial ten-year claim:
<https://www.theatlantic.com/science/archive/2019/07/ten-years-human-brain-project-simulation-markram-ted-talk/594493/>

KEY INTERVIEW APPEARANCES

Henry Markram (Blue Brain Project)
Kathryn Hess (Blue Brain Project)
Sean Hill (Blue Brain Project)
Eilif Mueller (Blue Brain Project)
Christof Koch (Allen Institute for Brain Science, Seattle)
Sebastian Seung (Princeton University)
Jeff Lichtman (Harvard University)
Haim Sompolinsky (Hebrew University, Jerusalem)
Idan Segev (Hebrew University, Jerusalem)
Stanislaw Dehaene (NeuroSpin, Paris)
Cori Bargmann (Rockefeller University, New York)
Terrence Sejnowski (Salk Institute, San Diego)
Zach Mainen (Champalimaud Center for the Unknown, Lisbon)
Anne Churchland (Cold Spring Harbor Laboratory, New York)
Moritz Helmstaedter (Max Planck Institute Frankfurt)