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America at 250: A Beacon for the AI Age Conference

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SPECIAL PROFILE

Regina Barzilay

Pioneer of AI for Healthcare, Diagnosis, and Drug Discovery

School of Engineering Distinguished Professor for AI and Health, MIT

Faculty Lead for AI, MIT Jameel Clinic · Member, MIT CSAIL

IEEE Frances E. Allen Medal · 2025

Inaugural AAAI Squirrel AI Award for the Benefit of Humanity · 2020

MacArthur Fellow · 2017

Member, U.S. National Academy of Engineering · National Academy of Medicine · American Academy of Arts and Sciences

Honored as one of the America 250 · AI Pioneers

I *Building AI for Human Health*

FROM NATURAL LANGUAGE TO THE DIAGNOSIS OF DISEASE

Regina Barzilay is among the most consequential American computer scientists of her generation — a researcher who has shown more clearly than almost any contemporary how artificial intelligence can be turned, with rigor and care, toward the work of saving human lives. As the School of Engineering Distinguished Professor for AI and Health at MIT, faculty lead for artificial intelligence at the MIT Jameel Clinic, and a member of the Computer Science and Artificial Intelligence Laboratory (CSAIL), she stands at the center of a field she did much to create: machine learning for medicine.

Born in Chișinău, Moldova, and educated at Ben-Gurion University in Israel, Barzilay completed her doctorate at Columbia University and joined the MIT faculty in 2003. Her early career placed her among the leading figures in **natural language processing** — work that ranged from automatic news summarization to the deciphering of long-lost languages. In **2014**, a personal diagnosis of breast cancer changed the direction of her research. She turned the full force of her methods toward oncology and the fight against disease.

Today, the algorithms developed by Barzilay and her collaborators at Massachusetts General Hospital, and tested at hospitals from Boston to Sweden to Taiwan, can identify women at elevated risk of breast cancer years before symptoms appear. In parallel, her group has produced machine-learning models for drug discovery that have already contributed to the identification of new antibiotic candidates effective against multidrug-resistant bacteria — a body of work that places computer science at the front lines of one of the great public-health challenges of our century.

"If a system like this had existed earlier, my own cancer could have been detected two or three years sooner. That is the difference AI can make in a human life."

II *From the Bench to the Bedside*

AI FOR DRUG DISCOVERY, EQUITY, AND GLOBAL HEALTH

In **2017**, Barzilay was named a **MacArthur Fellow** — the so-called "genius grant" — in recognition of her work developing machine-learning methods that allow computers to extract meaning from vast and complicated bodies of human language and biomedical data. In **2020**, she became the inaugural recipient of the **$1 million AAAI Squirrel AI Award for Artificial Intelligence for the Benefit of Humanity** — the most significant AI award created specifically to recognize work that improves human life. In **2025**, she received the **IEEE Frances E. Allen Medal**, sponsored by IBM, for innovative machine learning algorithms that have led to advances in human language technology and demonstrated impact on the field of medicine.

Beyond the algorithms themselves, Barzilay has been a singular voice on the responsibility of AI in medicine. She has insisted on standards for transparency, equity, and validation in clinical AI — warning that without rigorous evaluation across populations, the same systems that promise earlier diagnosis can deepen existing disparities in care. Through partnerships with organizations such as Institute Protea in Brazil, her tools are being made available to underserved communities, ensuring that AI in medicine becomes a global public good rather than a privilege of well-resourced hospitals.

She is a member of the U.S. National Academy of Engineering and the National Academy of Medicine, and a Fellow of the American Academy of Arts and Sciences, the AAAI, and the ACL. Across natural language processing, oncology, drug discovery, and the deciphering of dead languages, her work bears a single signature: the patient, scientific use of machine learning to address problems that matter for the lives of human beings.

"AI in medicine must be evaluated with the same rigor we demand of any clinical instrument — because the stakes are not abstract. They are measured in lives."

III *America at 250: AI Pioneers*

RECOGNIZING A FOUNDATIONAL CONTRIBUTION TO THE AI AGE

At the **America at 250: A Beacon for the AI Age Conference** at Loeb House, Harvard University, on **May 1, 2026**, **Governor Michael Dukakis and Nguyen Anh Tuan** honor Regina Barzilay as one of the **America 250 · AI Pioneers** — the fifty leaders whose work is shaping America in the Age of Artificial Intelligence.

The Conference's recognition celebrates a body of work that has redefined what AI can do for human health — from the earliest detection of cancer, to the discovery of new antibiotics for an age of resistant disease, to the patient insistence that medical AI be evaluated, validated, and made available across the populations whose lives depend on it. Barzilay's career stands as one of the clearest examples of artificial intelligence put in the service of human flourishing.

"The deepest test of artificial intelligence is not whether it is powerful, but whether it relieves suffering."

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From the natural-language algorithms of her early career to the cancer-detection models now in use across continents, from the discovery of new antibiotics to the standards she has championed for medical AI, Regina Barzilay has shown what the AI Age looks like at its best: rigorous, humane, and devoted to the protection of human life. America at 250 honors that work — and the future it is helping to make possible.

CONCLUSION

From the patient mathematics of natural language processing to the urgent science of cancer detection and antibiotic discovery, ***Regina Barzilay has shown what AI in service of human life looks like*** *— work that will guide the responsible deployment of artificial intelligence in medicine for generations, and remind us that the highest test of any technology is the human suffering it relieves.*