

Meet...

Cathy Drennan

CHEMIST AND BIOPHYSICIST, Cambridge, Massachusetts

What She's Doing

Our bodies, like nearly all living things on the planet, run chemical reactions in watery fluids at a neutral pH. Naturally occurring metals help these processes occur safely and efficiently.

Cathy Drennan studies how metals do such important jobs in biology. Since metals are key components of many enzymes, cell proteins, and even medicines, this work is really important for our health.

Metals also act as molecular helpers in chemical reactions that rid the atmosphere of pollutants like carbon monoxide. So Drennan's work goes toward protecting the environment, too.

"I started my career as a high school science teacher, but I wanted to learn more about research, so I went to graduate school."

Her Findings

Using physics and computer science approaches, Drennan pieces together the three-dimensional shapes of proteins. She did this recently with an iron, nickel and sulfur-containing enzyme that converts carbon dioxide first into carbon monoxide, then into acetyl CoA, a key molecule in energy production.

Drennan was quite surprised to find that metals help this enzyme twist itself in a way that creates a molecular tunnel for the carbon monoxide to travel through. For this experiment, she used an inventive approach that substituted xenon for carbon monoxide. Both are gases of about the same molecular size, but xenon can be used more readily in a freeze-frame molecular snapshot of the enzyme.

Why did nature create such an extremely long tunnel in a protein? Drennan thinks it's an elegant design for an assembly line-like structure that assures the quick and efficient production of the vital molecule acetyl CoA.



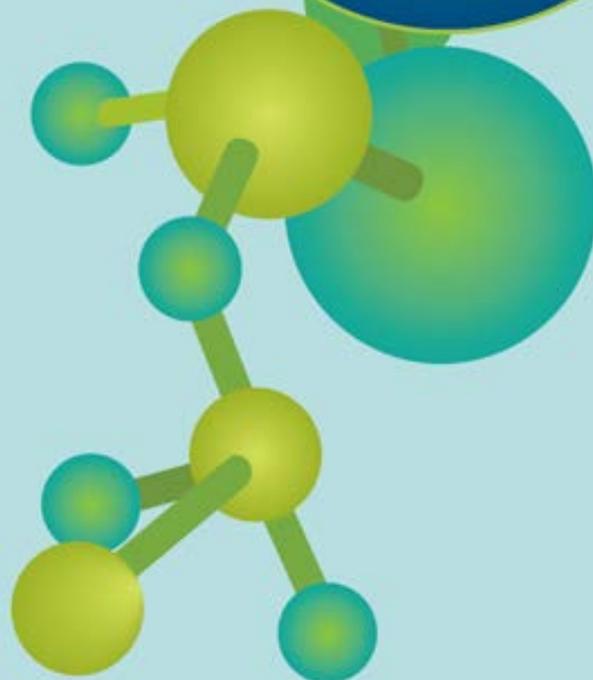
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Newton, Massachusetts

JOB SITE
Massachusetts Institute of Technology

FAVORITE TEAM
Boston Red Sox

ALTERNATE CAREER CHOICE
Politician

BEST READING
Murder mysteries



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