Science Stories with a Smile

Can compounds in garlic fight disease? (Yes)

Is extracting fuel from sand a lost cause? (No)

Could a space elevator be built out of nanotubes? (Maybe)

These are just three questions out of the thousands that Weizmann Institute scientists attempt to answer. These and others are depicted in brief, lighthearted comic-book stories published by the Weizmann Institute of Science. The series, **Nano Comics**, presents the tales of five main characters who live and work around a research institute that exists in no particular time or place. The young hero of the series is a 10-year-old boy named **Nano** whose parents have left him in the care of his grandmother, a cook in the institute's cafeteria, while they go off on a long space journey.

Nano's natural curiosity leads him into all kinds of scientific adventures at the institute, which transport him to the very frontiers of human knowledge. The series' other heroes are **Femto**, an accomplished senior researcher with the soul of a child; **Giga**, an energetic younger female researcher with interests in many different fields; **Mega**, a postdoctoral fellow who is really a time traveler in disguise; and **Tera**, a graphic designer at the institute.

Each episode is based on the real work of Weizmann Institute scientists. The tales move around in time and space; the characters experience new places and cultures, encountering everyone from a Chinese wise man to Native Americans to industrial spies and more. Each comic tale includes a "science box" that explains, in a few words, the scientific research on which the story is based.

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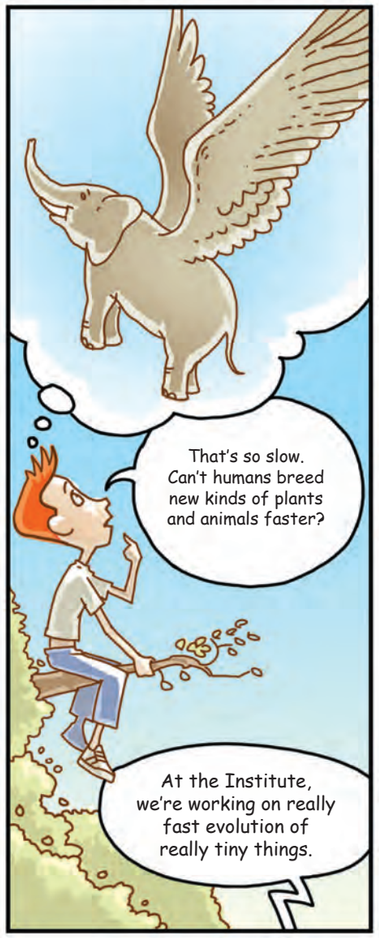
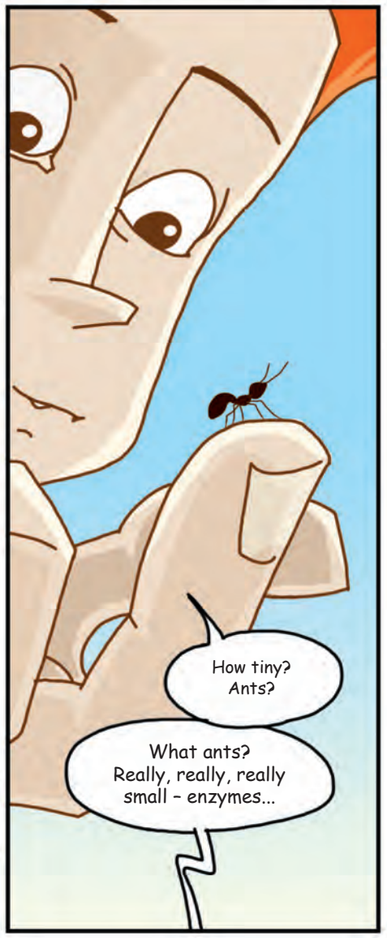
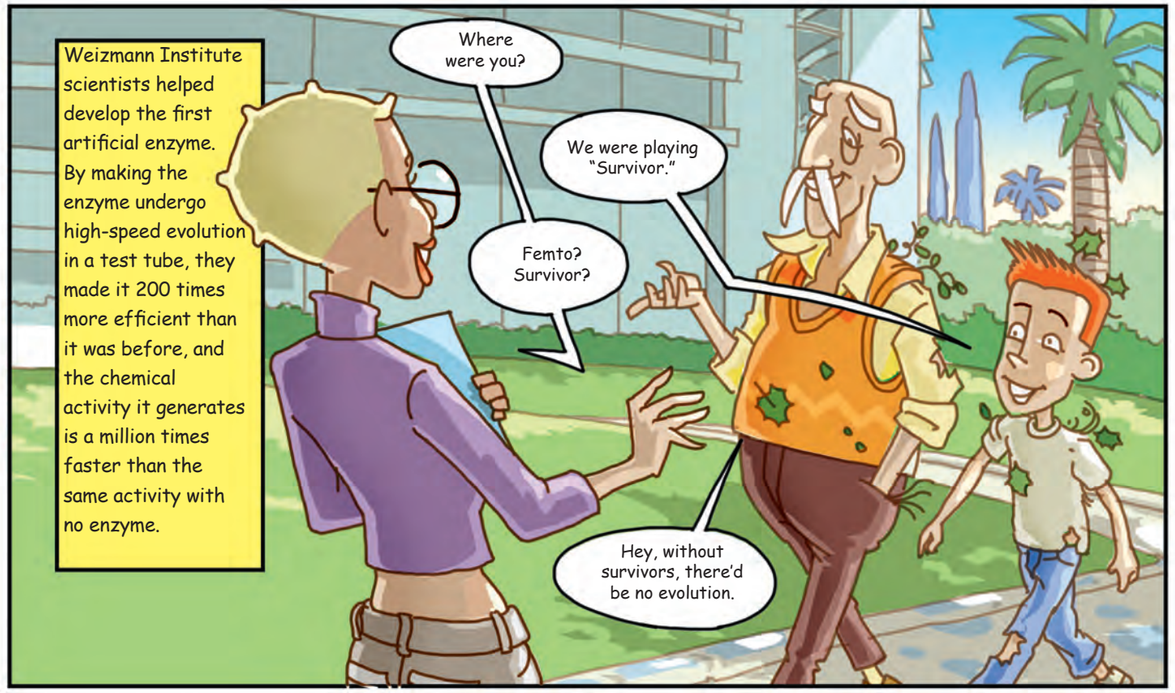
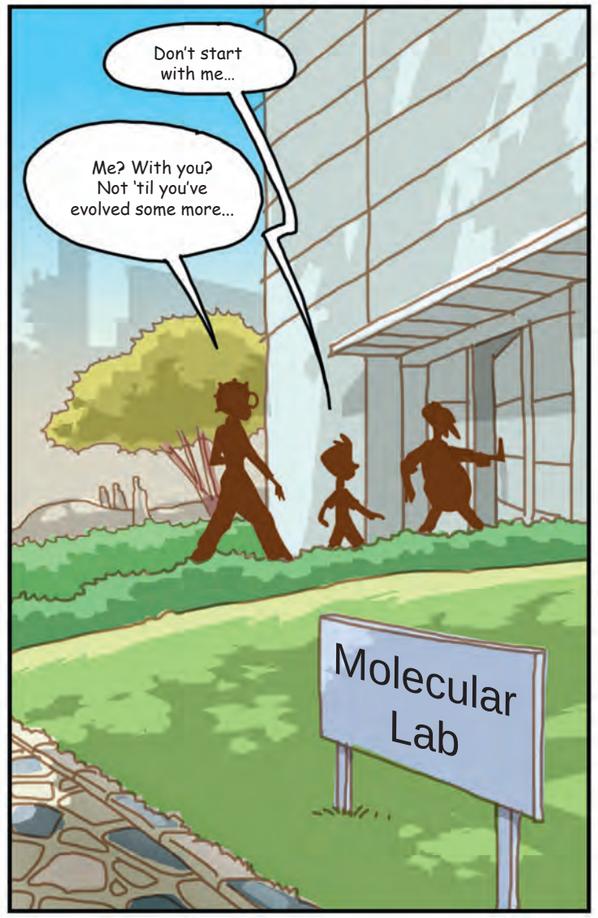
The Enzyme









Nano Comics

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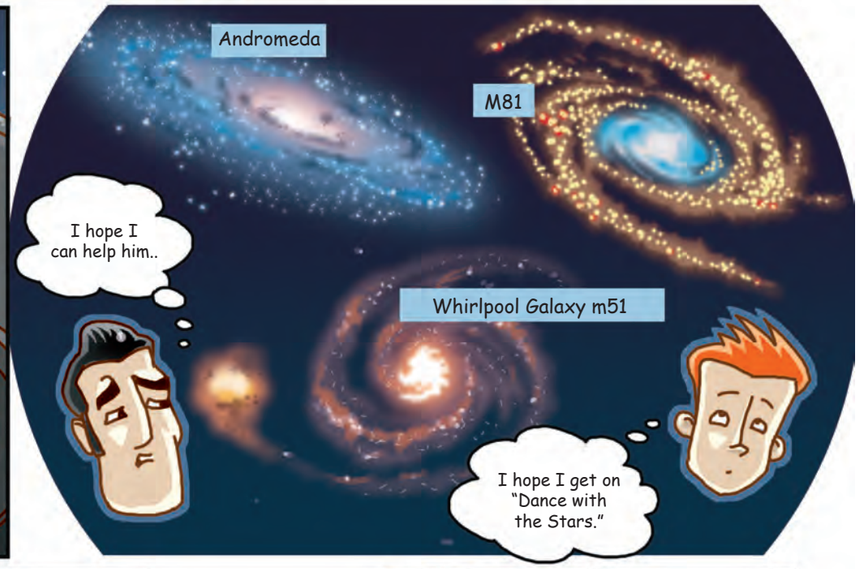
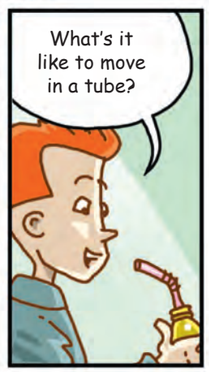
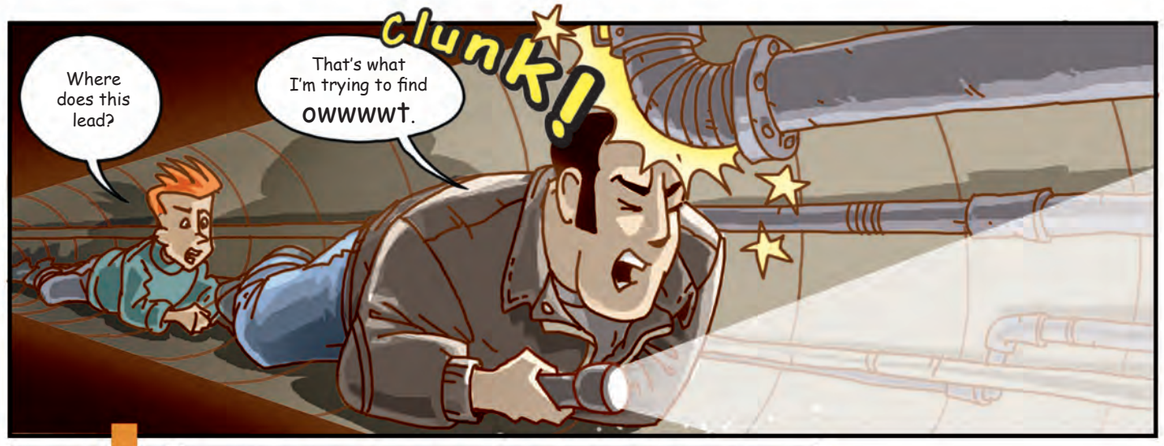
The Space Elevator







Carbon nanotubes are molecular threads with special properties. It's the strongest known material in the universe, and it might help us to build skyscrapers hundreds of stories tall or even an elevator between the Earth and a space station. Weizmann Institute scientists are investigating the strength of nanotubes.

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Worth a Trillion

?

The Institute, Design and Imaging Department

Tera! I just saw Bit and Byte again outside!

!?

Y'know, those two creepy guys...

!!!

There they are! Next to the molecular mathematics lab...

I don't like them one little bit...

After them!!

Tera, what is in the molecular mathematics lab?

Shhh... A molecular computer...

It's the smallest biological computer in the world!

And it's gonna be ALL ours... MWAHAHA

Every single bit!

A trillion computers in one drop of water!

Worth a trillion!

So smart...

So advanced...

Weizmann Institute scientists have developed the smallest nano-biological computer in the world. The vision: Trillions of these computers will wander around our body cells, identify processes that cause diseases, including cancer, and cure us before onset of disease progression.

BASH

Not so fast!

Which one is Bit and which is Byte??

Bit is the shorter one!

Our investigators thank you!

And our investigators thank you!

At least our molecules are safe!

Another bit bytes the dust!

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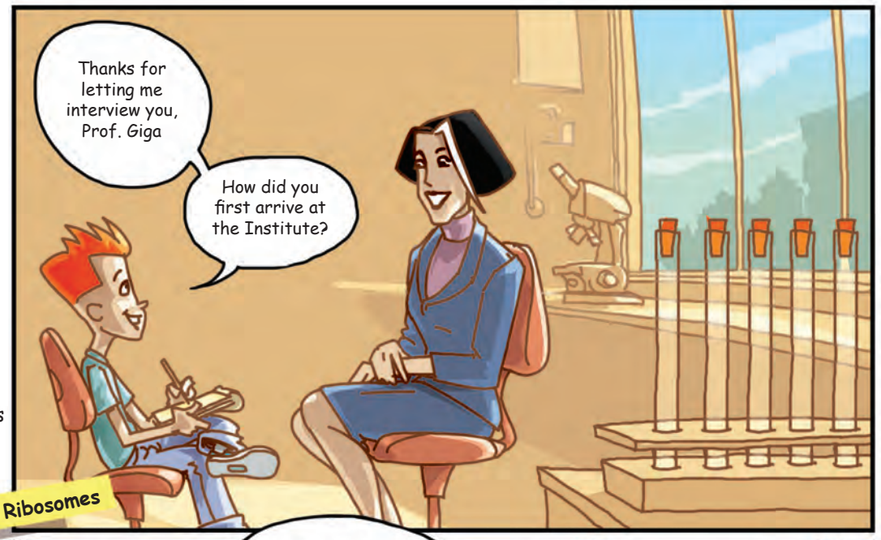
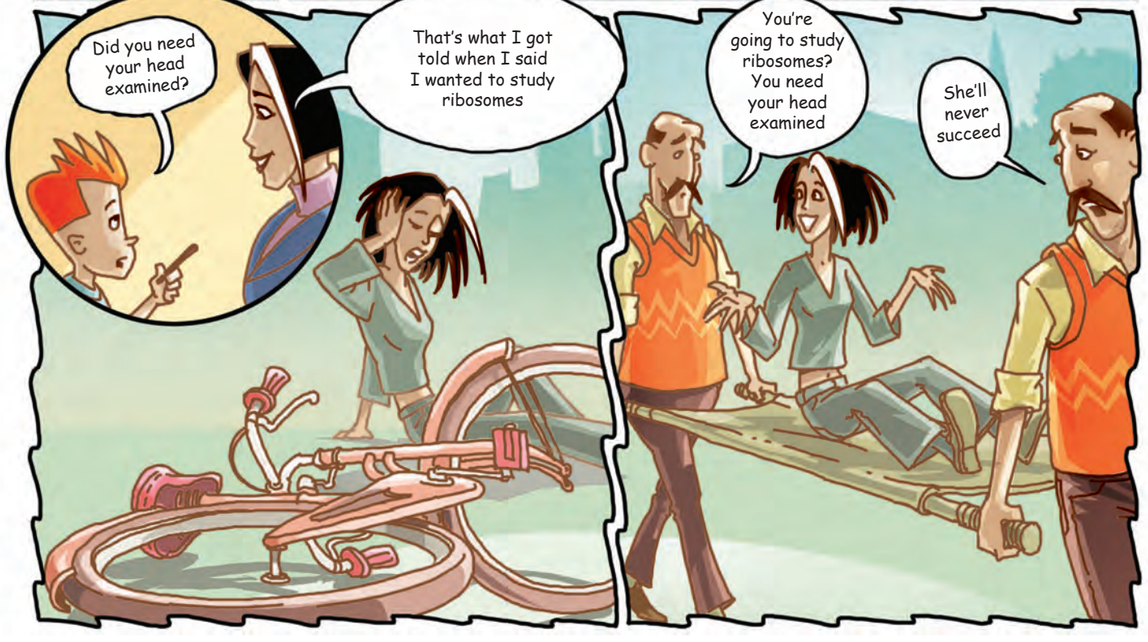
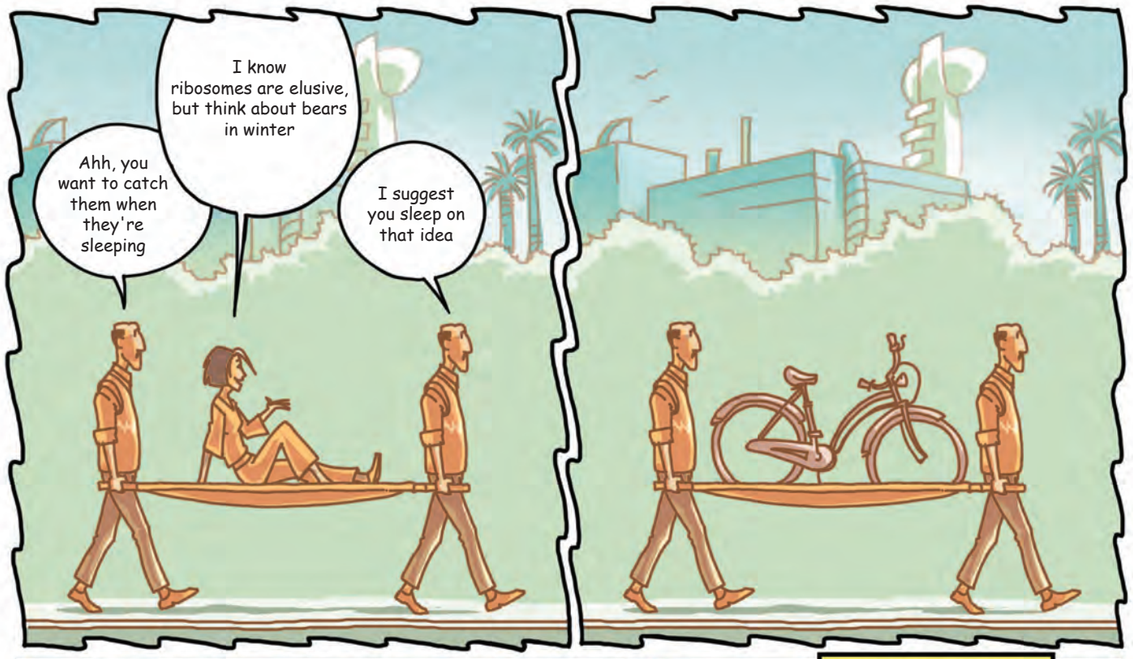
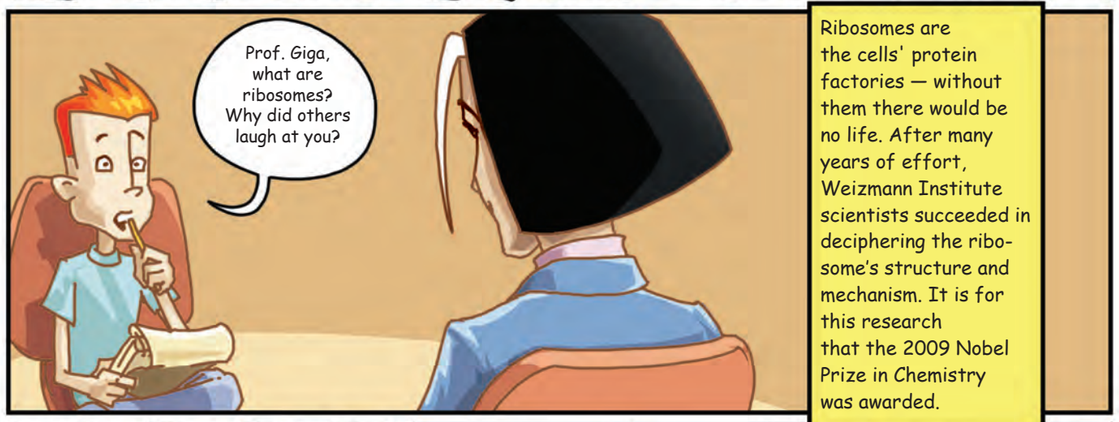
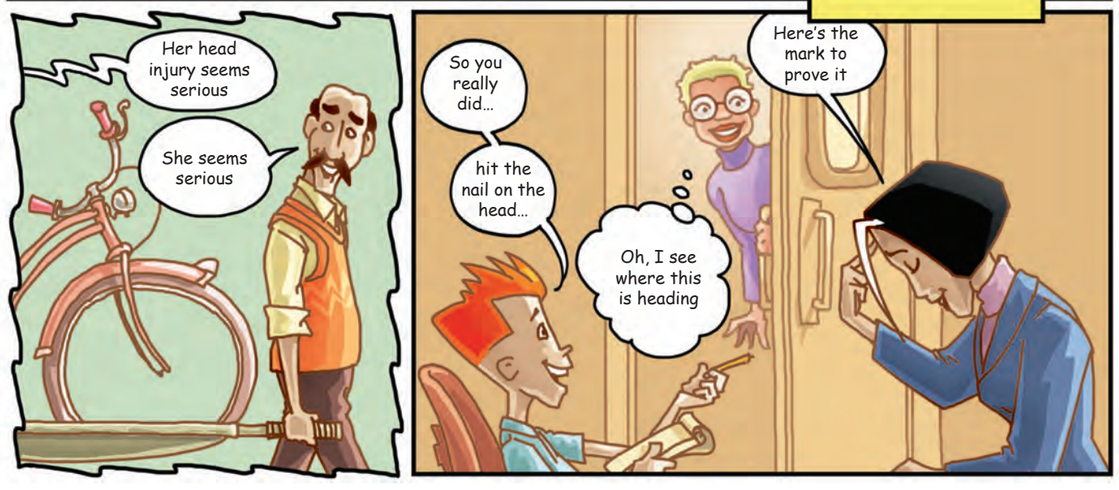
Head for Ribosomes











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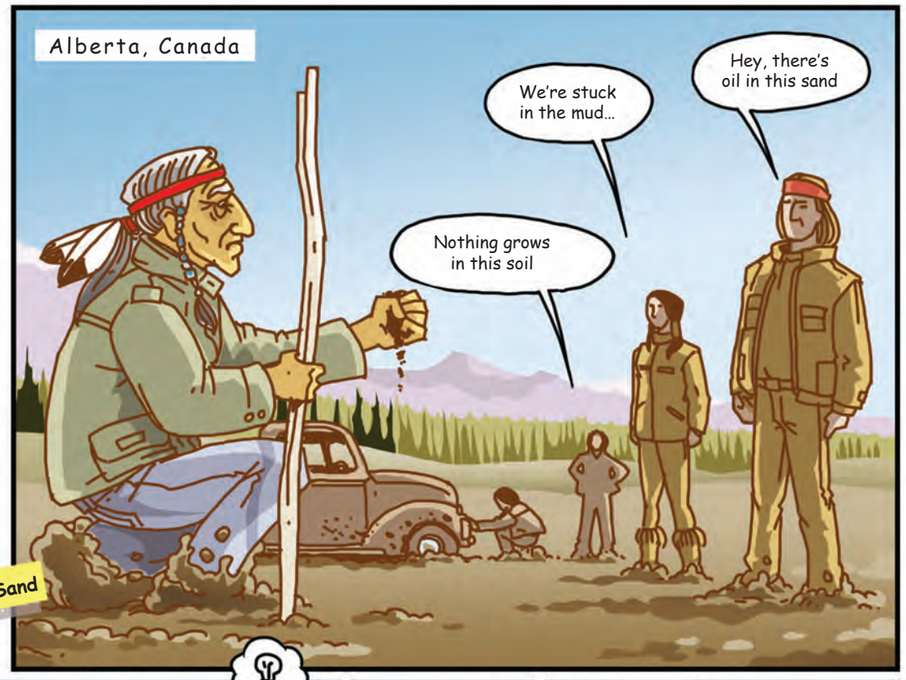
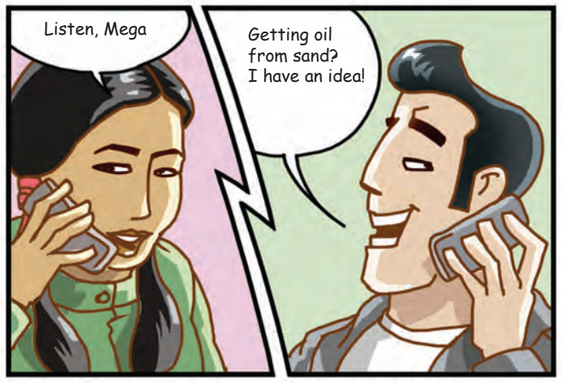
Squeezing Oil from Sand





Weizmann Institute scientists developed a process based on a super-critical liquid: Water heated under pressure, near the transition point to gas, can separate heavy oil or fossil fuels from sand.

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A Big Hand for Fly of the Year

Research lab

Tonight: The FLY

I've got it!

Hey Nano, know what I found?

Bring me a magnifying glass!

How was the costume party?

What did you find?

The protein for the beginning of muscle development

What do flies need muscles for?

BZZZZ

These flies didn't have the protein. Those did. See their developed muscles?

Bravo

Bravo

Bravo

Once again, Giga's research has made the international stage!

Weizmann Institute scientists discovered the protein responsible for the process in which cells fuse together to make muscle in animal and human embryos. The discovery was made in laboratory fruit flies (*Drosophila*).

Let me fly our results by you.

Oops. I think I just wiped out the scientific proof...

ZZZZTT

Good work!

Nano Comics

Amoebas for Peace

Institute labs

The scientific adventures of four adults - Giga, Femto, Tera and Mega - and one boy, Nano.

Amoebae...

What's in there?

Ami-what?

Amoebae. They're little but they can be very nasty...

They're a danger to humanity! The stomach diseases they cause can be fatal.

We're bad!

Amoeba's gonna eat ya!

Grrrr!

Aaaamoeeebaaa!

Maybe I'll pass...

Hah! Today's amoebae aren't what they used to be.

World Peace

Down with Disease

We Like Life!

Weizmann Institute scientists succeeded, through genetic engineering, to silence the genes that amoebae use to create disease-causing substances. These "disarmed" amoebae aren't harmful.

I promise to never harm another human being!

How did this happen to us?

Love, sister, is the answer.

Say, Femto, if it works on amoebae, maybe...

Forget it. Humans? Impossible!

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Times...Sixteen

This big laser has sixteen times the power of each little laser

Sixteen! That's a lot!

So which is better, a bunch of little ones or one big laser?

The big one! It's gigantic!

I see you've forgotten what I taught you about team work.

A group always has an advantage...Do you remember?

I didn't forget. But to win, the team needs really good players!

Nothing like teamwork

I agree

Can we sit?

Over the years, scientists have attempted to unite two valued properties of lasers: power and focus. Weizmann Institute scientists managed to create a strong, focused group beam in their special optics lab.

With the all-star team of focused beams, we can improve laser technology for space, and also for medicine...

Oh. I just remembered my appointment with Dr. Sunbeam

Does the 16-beam laser have a name?

I call it: Many Lights Make Handy Work

Hmm

Please! Try to focus!

You light up my life

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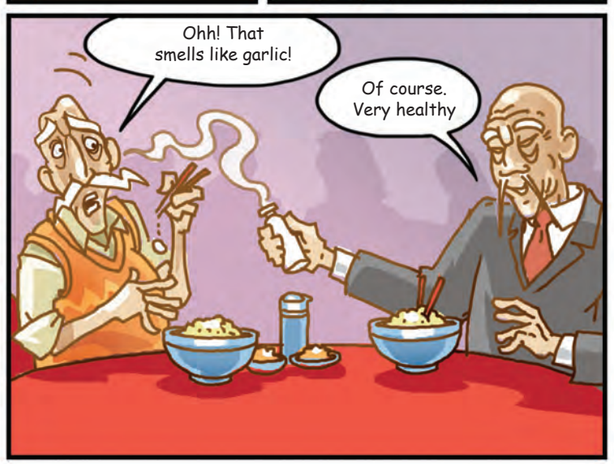
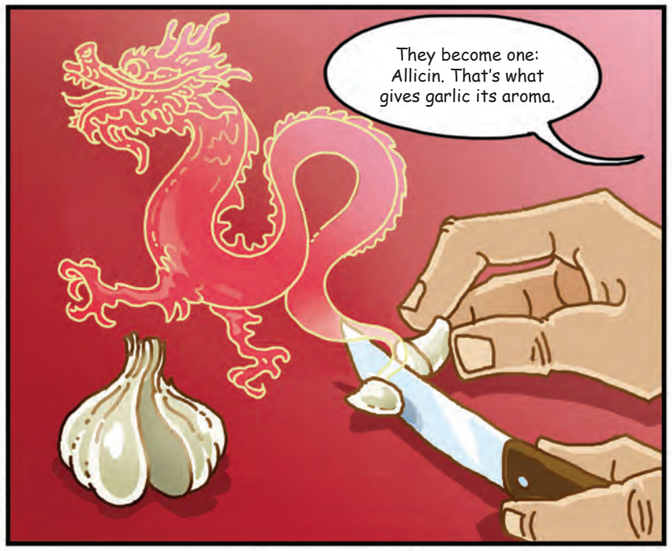
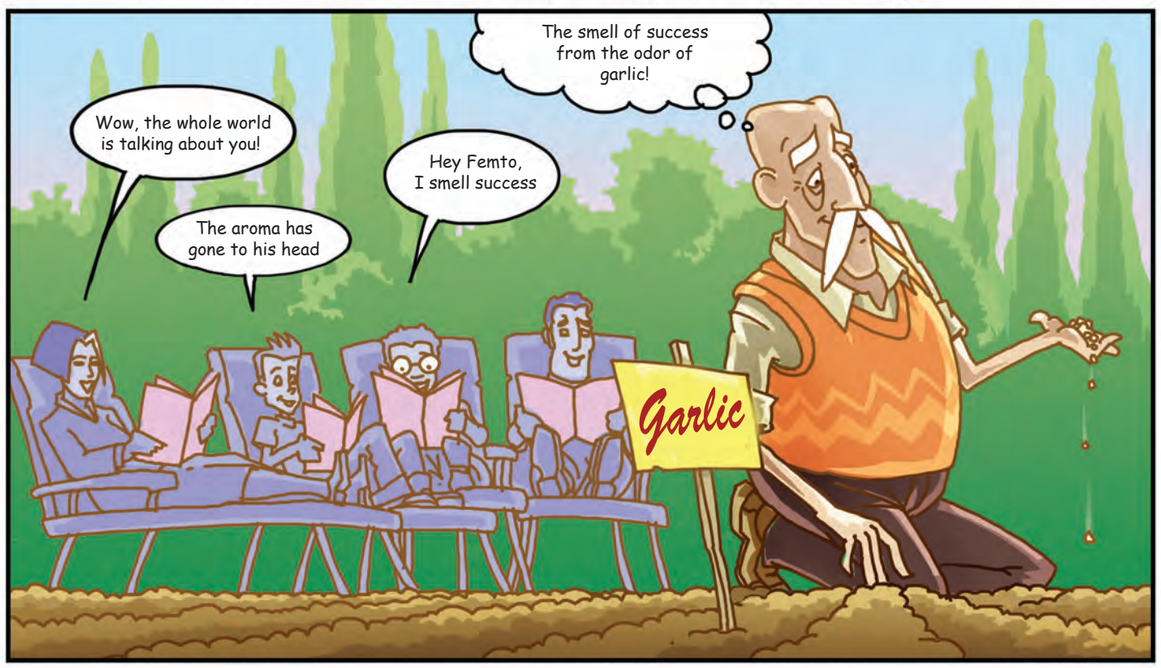
The Garlic Dragon





Weizmann Institute scientists discovered that when the two substances that make allicin are injected, one after the other, they turn into a "smart bomb" that can be directed against cancer cells.



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Solomon Says

Archaeological dig in the Arava desert, Israel

Another pottery shard, Professor?

Even a few. That's our work

What do you know about it? You're a physiologist!

Carmella's right. He's a physicist or something.

Physics? Gah!

What kingdom

Didst thou

Come from?

Your highness

It's not important where you're from, but when you lived

That's why they call you "the Wise."

Will people 3000 years from now know we were here?

They'll even know your game pieces were blue

Check-mate, your highness!

Hey, you can still see the blue color on that rook!

Are you an assistant archaeologist, now?

Gently. These people live in the past

How do you know it's a rook?

A 3-D scanning camera can quickly analyze ancient relics, identifying work styles and dates. The camera can even create computerized images of whole vessels from single shards.

You're too good to us...

There's no one like you, Indiana Mega...

Back for another chess game?

Excuse me, your Highness, I seem to have left...

Your mobile? Over there, by the quarry...

I must go...

When will you be back?

Nano Comics

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Blooming Dust

Say, Femto, do trees in the rainforest like all that rain?

Good question, and a problem for the trees.

I've got another problem. I can't find my glasses...

The rain washes out minerals the trees need from the Amazon soil. Fortunately, they get an "air lift."

And you won't guess from where! From the Sahara!

Very interssssting... I hear there are spectacle snakes in the Sahara

What are those two doing?

Carbonated?

Giving the trees mineral water...

Ahhhh...

You look thirsty

So, you were saying...

Winds lift clouds of dust from the desert, and these fertilize the Amazon

Weizmann Institute scientists discovered that the dust from the Bodele Valley in northern Chad crosses the ocean on winds, supplying vital minerals to the Amazon rainforest.

Exports create global growth!

Made in Africa! Makes us green!

Maybe the wind will blow in a new pair of spectacles?

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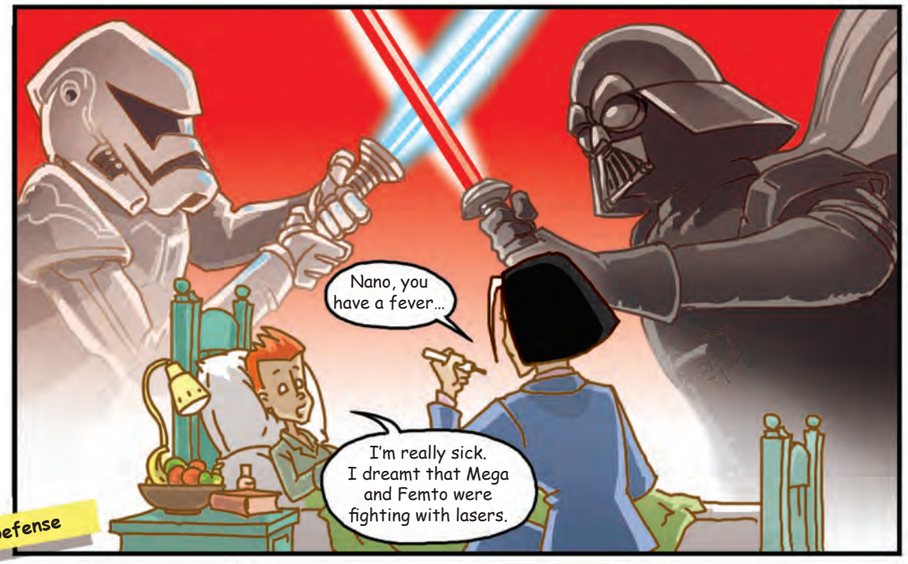
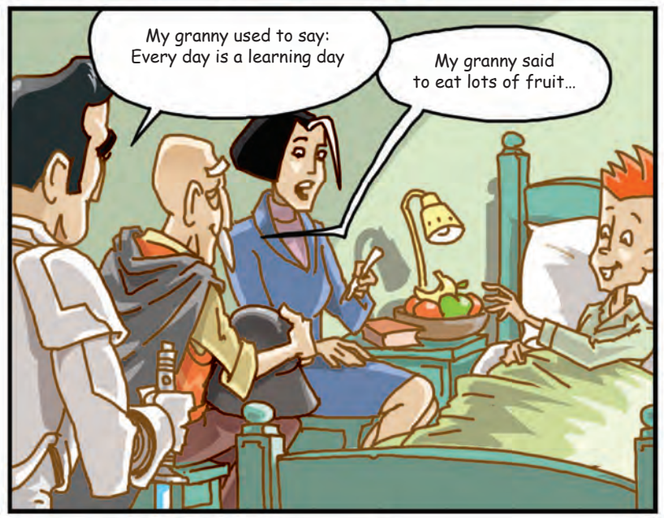
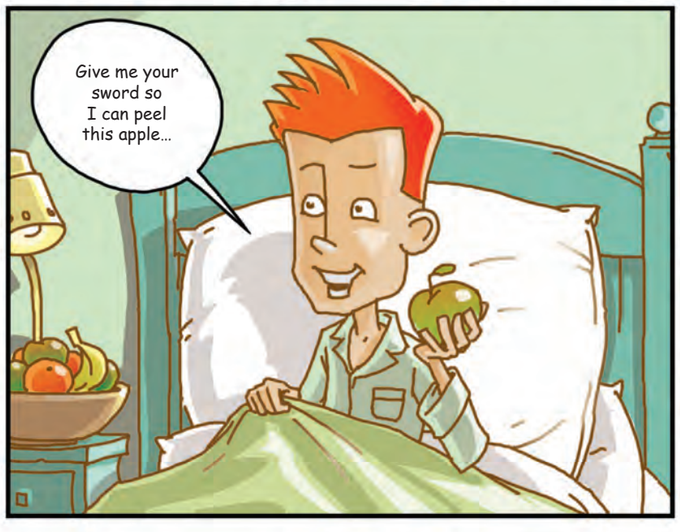
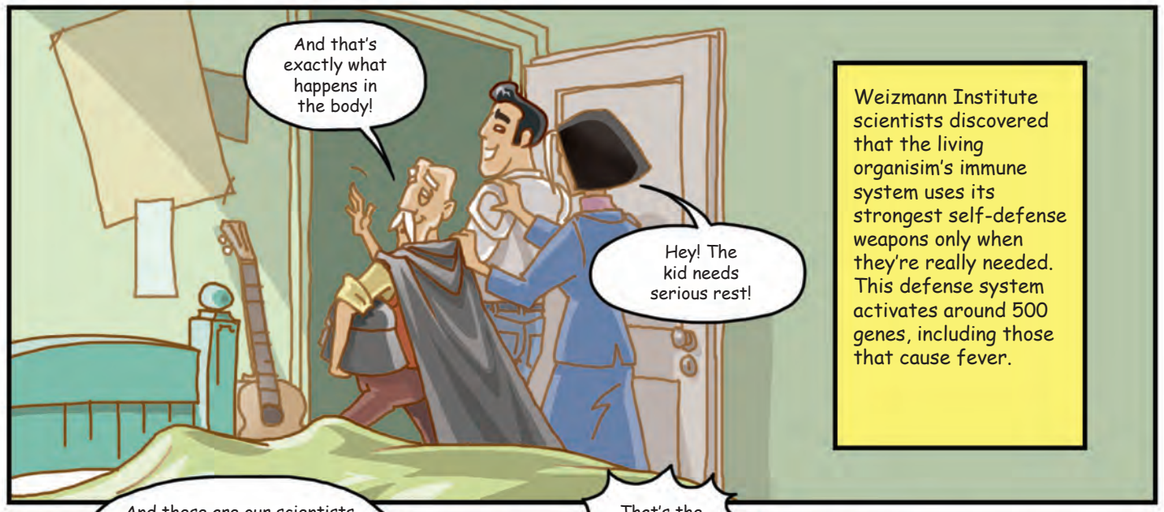
Heated Defense

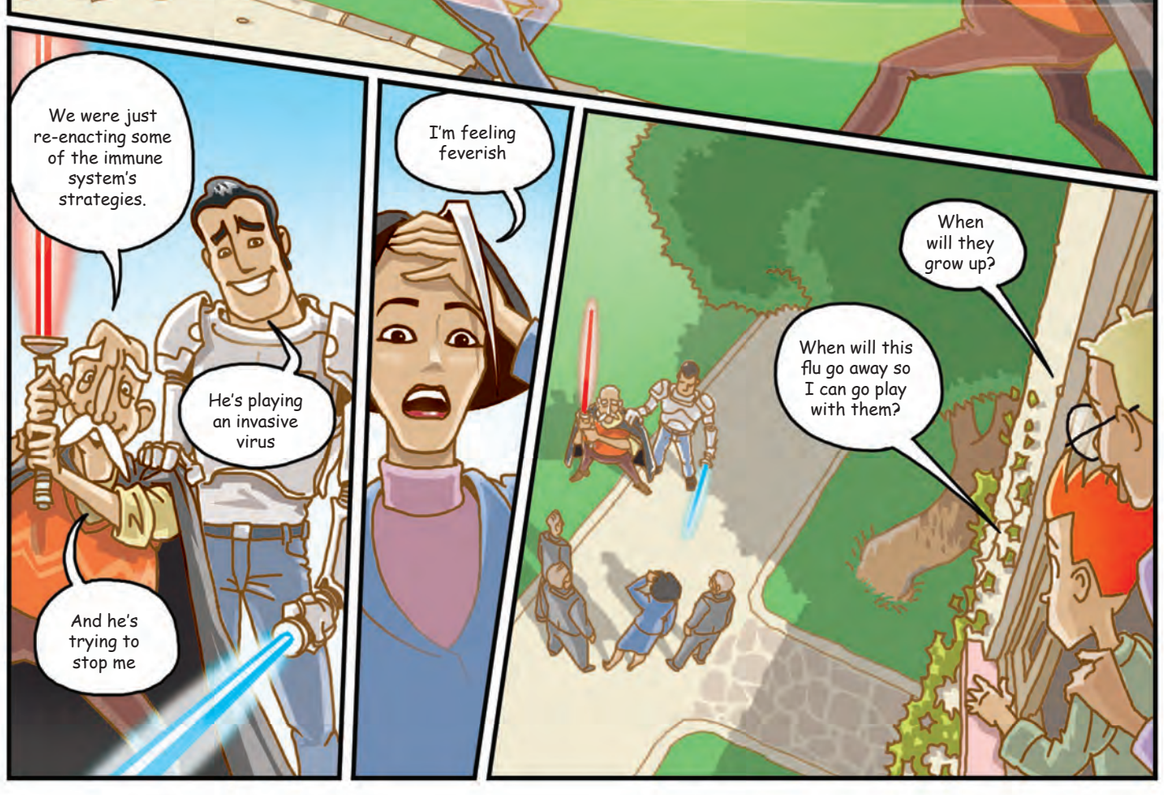








Weizmann Institute scientists discovered that the living organisim's immune system uses its strongest self-defense weapons only when they're really needed. This defense system activates around 500 genes, including those that cause fever.



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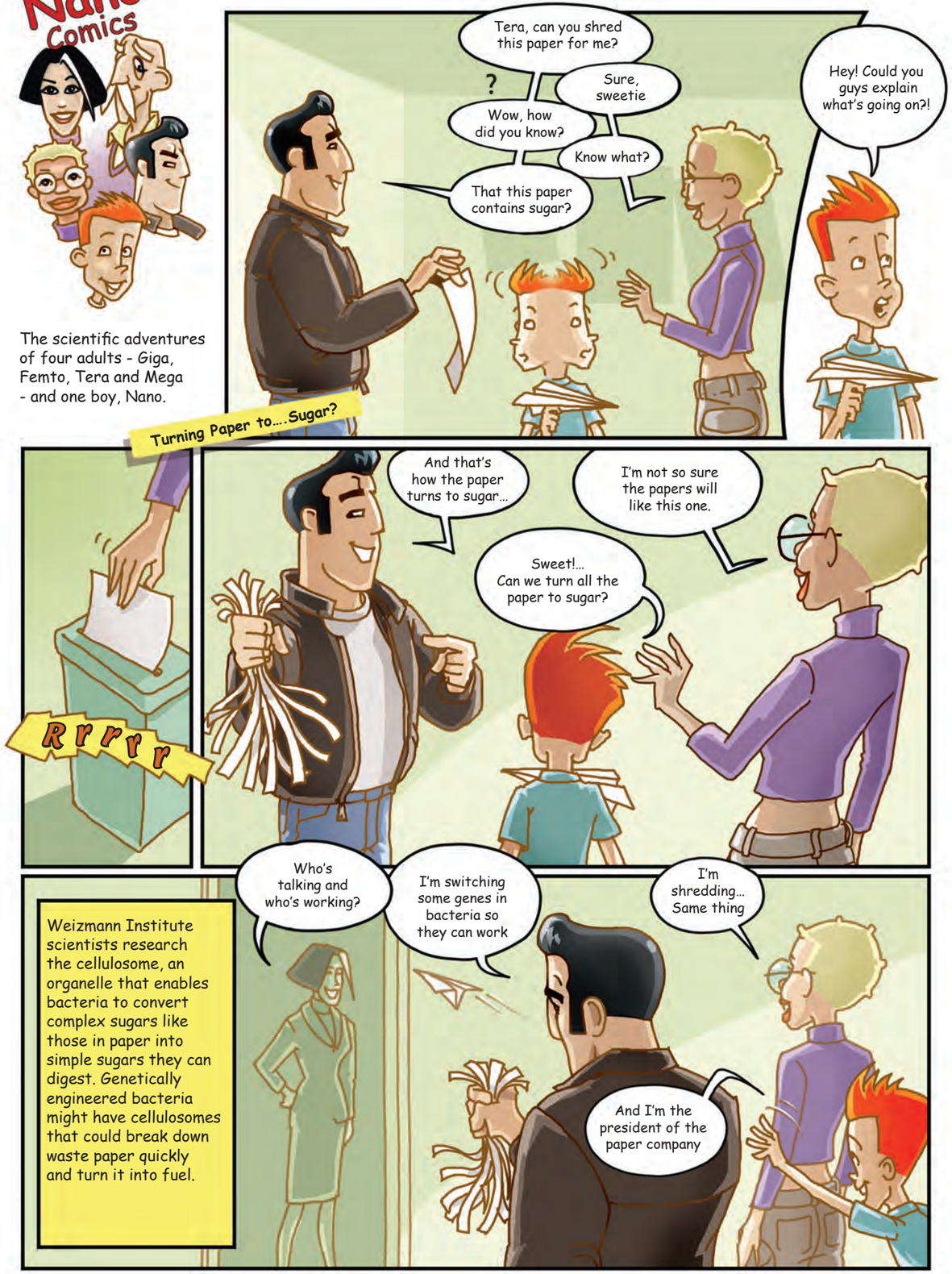


Michaela Holzberg

Science and Comics

Animix, the international animation, comics and caricature festival held in Tel Aviv in August, featured a full-sized **Nano Comics** exhibit. Similar exhibits were shown at this year's **Icon** science fiction and fantasy conference in Tel Aviv and the **Beer, Science and Good Spirits** evening in Rehovot. In addition to the exhibits, creative workshops were held for children, and these were led by Weizmann Institute research students together with Israeli comics artists. In the workshops, the children were presented with such real scientific questions as: Is there life on other planets? How do movies help scientists understand the brain? Could microscopic biological computers be injected into the body to stop disease? and more. A special workshop on the **Mysteries of the Ribosome** told the story of Prof. Ada Yonath, winner of the Nobel Prize in Chemistry for 2009.

Talia Kelem

Guy Yaakov

Lior Yavin

Mai Peer

Guy Harlap and Naama Bloch

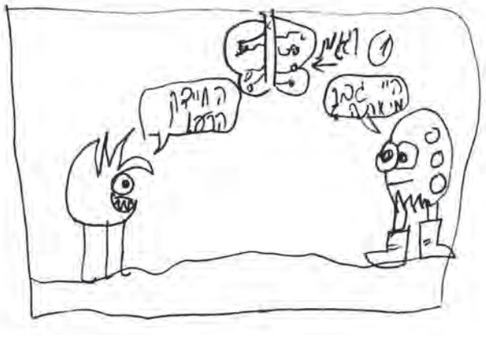
Lotem Lukser

(l-r) Yaniv Shimoni and Meir Goldberg

(l-r) Amos Ellenbogen and Danny Kerman

Dana David

Nosko



Ori Gruda

מכון ויצמן למדע

WEIZMANN INSTITUTE OF SCIENCE

The Weizmann Institute of Science is one of the world's leading multidisciplinary basic research institutions in the natural and exact sciences. The Institute's five faculties – Mathematics and Computer Science, Physics, Chemistry, Biochemistry and Biology – are home to 2,600 scientists, graduate students, researchers and administrative staff.

The Daniel Sieff Research Institute, as the Weizmann Institute was originally called, was founded in 1934 by Israel and Rebecca Sieff of the U.K., in memory of their son. The driving force behind its establishment was the Institute's first president, Dr. Chaim Weizmann, a noted chemist who headed the Zionist movement for years and later became the first president of Israel. In 1949, the Institute was renamed and formally dedicated as the Weizmann Institute of Science, in honor of Dr. Weizmann's 75th birthday.

Over the years, the Weizmann Institute has grown with the country, and it has been the site of a number of scientific milestones. Institute scientists were pioneers in the field of cancer research. Others planned and built one of the first electronic computers in the world, and the first in Israel. They were among the first to establish a company for transferring knowledge from academia to industry (Yeda Research and Development Co. Ltd.), and they initiated the founding of a science-based industrial park near the Institute. The Institute has also been the site of pioneering research in brain studies, nanotechnology and new methods for exploiting solar energy.

Research by Institute scientists has led to the development and production of Israel's first ethical (original) drug; the solving of three-dimensional structures of a number of biological molecules, including one that plays a key role in Alzheimer's disease; inventions in the field of optics that have become the basis of virtual head displays for pilots and surgeons; the discovery and identification of genes that are involved in various diseases; advanced techniques for transplanting tissues; and the creation of a nanobiological computer that may, in the future, be able to act directly inside the body to identify disease and eliminate it.

Today, the Institute is a leading force in advancing science education in all parts of society. Programs offered at the Davidson Institute of Science Education, which operates and coordinates the scientific activities of the Weizmann Institute, target exceptional and science-oriented students as well as high school dropouts, elementary through high school teachers, students of all ages and adults. In this way, the Institute shapes the future of Israeli society, nurturing its curiosity and eagerness to learn in order to develop into an educated and knowledgeable society.