

# TheScientist

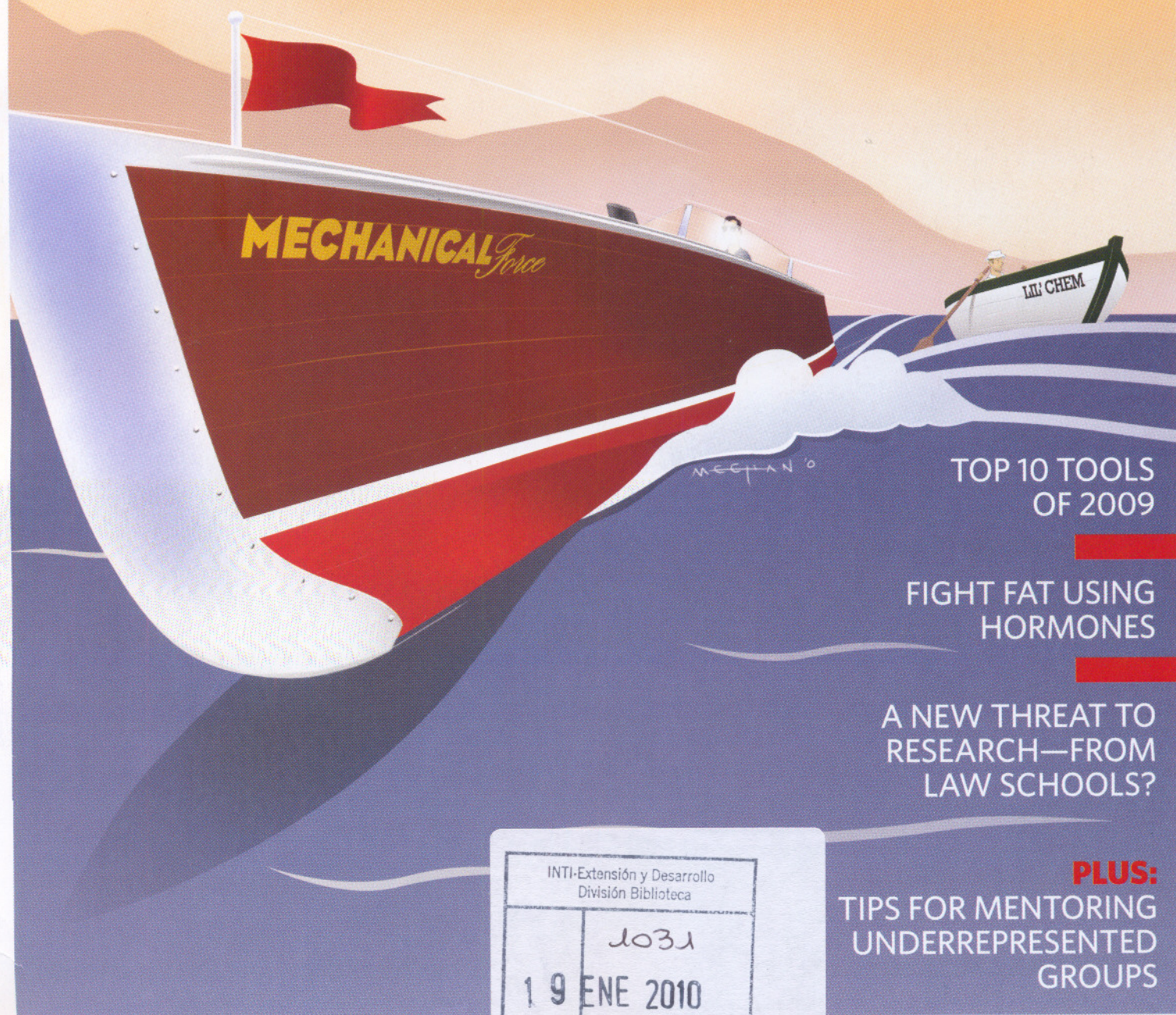
\$4.99 | VOL. 23 NO. 12 | DECEMBER 2009 | WWW.THE-SCIENTIST.COM

MAGAZINE OF THE LIFE SCIENCES

Programa de  
Biotecnología  
002

## FULL SPEED AHEAD

PHYSICAL FORCES IN AND AROUND  
CELLS ARE MAKING WAVES IN BIOLOGY



TOP 10 TOOLS  
OF 2009

FIGHT FAT USING  
HORMONES

A NEW THREAT TO  
RESEARCH—FROM  
LAW SCHOOLS?

**PLUS:**  
TIPS FOR MENTORING  
UNDERREPRESENTED  
GROUPS

INTI-Extensión y Desarrollo  
División Biblioteca

1031

19 ENE 2010

CONTENTS

# December 2009



26

TheScientist 2009

**TOP 10**  
INNOVATIONS

41



34

## FEATURES

### 26 Full Speed Ahead

**COVER STORY »** For centuries, scientists have showed little regard to the physical forces acting in and around cells. But, as JEF AKST reports, the growing realization that these forces have a pervasive presence in physiology, and act with astonishing speed, has caused many to consider the possibility that mechanical signaling may be just as important as chemical communication in the life of a cell.

### 34 Hormones in Concert

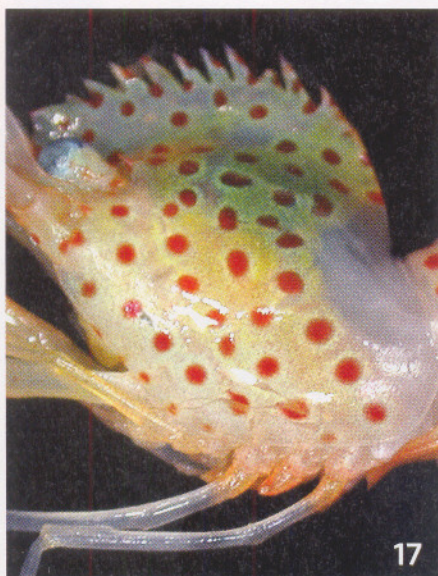
Multiple hormones act in concert to regulate blood sugar and food intake. Using this knowledge, scientists have already orchestrated a new diabetes therapy. CHRISTIAN WEYER of Amylin Pharmaceuticals hopes the same approach will also produce new treatments for obesity.

### 41 Top 10 Innovations of 2009

Check out the ten most exciting tools to hit the life sciences this year, hand-picked by our expert panel of judges.

## ON THE COVER

Illustration by Andrew Meehan



17



51



64

## DEPARTMENTS

## 13 Editorial

## Stumbling Towards Nirvana

The promises of personalized medicine have failed to materialize. That may be about to change.

BY RICHARD GALLAGHER

## 17 Notebooks

No kissing here; Subsidized science; *Shrimpus eBayicus*; In science we trust; Wolf whistle

## 23 Opinion

## A Legal Challenge to Animal Research

Animal rights law courses may threaten the use of animals in medical research.

BY P. MICHAEL CONN

## 25 Column

## Speak Your Mind

You don't like my ideas? Tell me to my face, please.

BY STEVEN WILEY

## 48 Profile

## Divide, Conquer

Michael Glotzer's built-from-scratch biochemistry, and do-it-yourself genetics and microscopy, have revealed some of the secrets of cell division.

BY KAREN HOPKIN

## 51 The Literature

Hot Papers: Small RNAs work in mysterious ways; introducing a new cytokine; boost SIRT1, beat diabetes. Scientist to Watch: Beth Shapiro.

## 55 Lab Tools

## Guiding Light

How to manipulate cellular events with the right light sensing molecule and a flash of light.

BY AMBER DANCE

## 61 Bio Business

## Pharma CPR

Meet the stalled drugs that pharmacogenomics (aka personalized medicine) might bring back to life—or kill for good.

BY BRENDAN BORRELL

## 64 Careers

## Addressing Cultural Caveats

Tips for mentoring underrepresented groups

BY KATHERINE BAGLEY

## 92 Foundations

## Merrifield Peptide Synthesizer, circa 1964

BY ANDREW MANGRAVITE AND ELIE DOLGIN

## IN EVERY ISSUE

## 11 Contributors

## 14 Mail

A Theory, Resisted; Why Stories Matter; Message from Meagerness; An NIH for Agriculture?

## 58 The Guide

## 83 Recruitment