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# Fresh Target in Hunt for a Migraine Cure

By SHIRLEY S. WANG

The hunt is intensifying for new treatments for migraines, the common and debilitating headaches that have confounded scientists for decades.

Of greatest focus for researchers is a brain chemical known as CGRP, which appears to play a role in the transmission of pain, but not in other brain functions, such as cognition or mood.

**IN THE LAB** Researchers are trying a variety of experimental drugs to stop CGRP from working by blocking its receptors in the brain. Others are working on artificial antibodies that could soak up the chemical in the bloodstream or brain before it can trigger migraines.

Experts say the need for new medicines to treat migraine pain once it begins is great because current drugs only provide some benefit for 50% to 60% of sufferers and can't be used in people with heart disease or who

have had a stroke. Also, they aren't a cure, and in many cases, the headaches tend to come back within 24 hours.

There also is a separate category of preventive drugs, which tend to be used by a small proportion of people who suffer from more frequent or debilitating migraines.

"People need migraine drugs that have a rapid onset of action, that take the pain away and keep it away," says Richard Lipton, director of the Montefiore Headache Center in New York.

Headache disorders are among the most common medical conditions world-wide. More than 1 in 10 adults globally are affected by migraines, which can be incapacitating, according to the World Health Organization. International studies have found that 50% to 75% of adults have reported a headache in the past year, with up to 4% of the global population reporting having a headache in half or more of the days each month, WHO says.

There isn't such a thing as a "reg-

ular" headache, but rather more than 300 types, says David Dodick, a professor of neurology at the Mayo Clinic's branch in Phoenix and chairman of the American Migraine Foundation. People having migraines usually experience intense pain,

### 1 in 10

More than this number of adults world-wide are affected by migraines, according to the World Health Organization

sensitivity to light, dizziness and sometimes nausea and visual and sensory symptoms called auras. Two other major types of headaches are caused by tension or medication

overuse.

Nonsteroidal anti-inflammatory painkillers such as ibuprofen work for some migraine sufferers. But the class of migraine medicines that hit the market in the 1990s called triptans remain the best or only treatment option for many patients. Nevertheless, about half of sufferers don't respond to them or can't take them because of other health reasons.

CGRP, which stands for calcitonin gene-related peptide neurotransmitter, has long been thought to play a role in migraines, but for much of that time for the wrong reason. Part of the confusion was because of a misunderstanding of migraines themselves.

Why they occur still isn't clear, but specialists say they have recently begun to understand the migraine as a brain disorder and not a vascular disorder. Until about 12 years ago, they were believed to stem from constriction of blood vessels in the brain. The dilation of the vessels to compen-

sate then led to the throbbing pain, so the thinking went.

Now, it appears more likely that migraines "hijack" the brain's normal pain circuitry, says Dr. Dodick. The brain's normal pain-sensory system, in which nerve endings send messages to the brain about a threat, goes awry in migraines.

Experts disagree about how a migraine is triggered, but the trigeminal nerve—an important pathway that carries sensory information about the face—and its connections to numerous other nerves and the brain appear to be responsible for transmitting the pain.

Researchers also have isolated certain genes that might be linked to a predisposition for migraines, Dr. Dodick says.

Triptans, which promote blood-vessel constriction and inflammation, block the release of CGRP in the trigeminal nerve. While CGRP does aid the blood-vessel dilation process, its

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# Swim Class for Grown-Ups



**Going Deep**  
A recent adult swim class at AquaSkills, which is located in Manhattan and specializes in helping late learners feel at ease in the water.

## Wrong Call: The Trouble Diagnosing Diabetes

By KATE LINEBAUGH

With cases of diabetes growing each year, many adults are getting caught in a potentially dangerous situation: they are diagnosed with Type 2 diabetes when they actually have Type 1 diabetes, a substantially different condition.

Both types of diabetes make it difficult for patients to control blood-sugar levels, which can lead to complications that include blindness, kidney failure and death. But Type 1 and Type 2 require different forms of treatment.

Alissa Kaplan Michaels, who has Type 1 diabetes, lived for 3½ years with the wrong diagnosis. The New York public-relations consultant says she complained to her doctor in 2008 of blurry vision and was told she had Type 2 diabetes after a blood test showed high sugar levels. She changed her diet and exercised more, but her blood-sugar levels kept rising. She started taking several oral diabetes medications. She stopped eating bread and pasta. She changed doctors—three times. And she still felt terrible.

Last fall, a covering doctor at her endocrinologist's practice started asking about her health history, childhood weight patterns, her recent struggles with her blood sugar and family history of Type 2 diabetes, of which there was none. That day, Ms. Kaplan Michaels got a new diagnosis. She didn't have Type 2 diabetes, she had Type 1.

Ms. Kaplan Michaels, 44 years old, immediately dropped the oral medi-



Alissa Kaplan Michaels, who has Type 1 diabetes, struggled for 3½ years before her disease was diagnosed correctly.

## 37% of Adults Lack Basic Skills in the Water; More Clinics Adding Specialized Classes

By SANETTE TANAKA

Rob Pace is excited to go swimming with his two kids on their upcoming vacation in Palm Beach, Fla. One problem: The 39-year-old never learned to swim.

So twice a week before work, Mr. Pace sneaks out of the house for adult swim lessons at a pool in Manhattan's Financial District. After three weeks, he can now hold his breath under water and glide while kicking for about a lap. He is waiting until his vacation to surprise his kids with his new skills.

"They're going to be absolutely stunned," says Mr. Pace, who lives in East Meadow, N.Y., and is a controller at a real-estate company.

An estimated 37% of U.S. adults can't swim 24 yards, the length of a typical recreation-center pool, according to the Centers for Disease Control and Prevention. Adults—including those who are able to swim—make up more than 70% of drowning deaths in the U.S. each year, according to the CDC.

Adults may miss out on learning to swim if they come from a culture where swimming isn't widely popular, or they grow up in metropolitan areas without easy pool access. Others are simply afraid—a fear sometimes fostered by over-anxious parents or a terrifying incident early in



**Making Waves**  
Lori Paillet, a founder and director of AquaSkills, works with Frank Papania of Bellmore, N.Y.

life. Teaching late learners tends to take longer and requires different techniques than those used with children.

A growing number of swim clinics are specializing in adult lessons, partly because learning to swim later in life can be a little embarrassing.

Beth Davis, who operates her own swim clinic in Boulder, Colo., says the number of adults in

her practice has nearly doubled in recent years, from 34 adult students in 2009 to 67 currently. Lori Paillet, a founder and director of AquaSkills, the Manhattan facility, says her adult clientele typically increases by 15% to 25% each year. Lessons there cost \$100 to register and \$1,200 for 10 private lessons.

Mr. Pace, who is taking lessons at AquaSkills, says his parents never knew how to swim and raised him in New York City, where he didn't have easy access to a pool. "Most of my friends at the time didn't know how to swim, so it didn't seem like a big deal," he says.

Joseph Riggio, who lives in Brooklyn, also signed up for swim lessons at AquaSkills, where his biggest hurdle has been overcoming an intense fear of the water. He says his father believed the best way to protect his son was to make him afraid of the water. Mr. Riggio recalls a trip to Coney Island when he was about 7 years old in which his father pushed him under the water repeatedly.

"After he threw me into the water the third time, I stayed down, and then he pulled me up. I was choking and coughing up water," says Mr. Riggio, owner of New York Pizza Suprema, a restaurant in Manhattan.

From then on, learning to swim became a

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## Learning to Crawl

Beginner adults who take two lessons per week typically learn how to swim in about three months, according to Jane Katz, professor of health and physical education at John Jay College of Criminal Justice and author of several books on swimming. Once the student is comfortable in the water, here are basic steps in learning to swim:



**AFTER TWO WEEKS**

In learning to float, the student positions his body face down and level with the water. When able to briefly hold the position, the student pushes off the wall and glides in the water. For help staying afloat, a kickboard can be used.



**AFTER ONE MONTH**

Now the legs are added. The student glides forward with an alternating flutter kick, exhaling throughout the glide and standing up when he runs out of air.



**AFTER TWO MONTHS**

Next, the arms are used to propel the body forward. The arm-over-arm motion begins, and the kicking motion is added. The student should also be able to push off from the wall into a streamlined glide with his arms and legs propelling him forward, exhaling throughout the glide.



**AFTER THREE MONTHS**

Finally, the actions are tied together with rhythmic breathing. Practice the arm-over-arm motion, turning the head from side to side and taking one breath for every two strokes. After this is mastered, add the kicking motion. When the student can sustain this for at least one lap, he has successfully learned to swim.

Illustrations by Kyle T. Webster

Source: 'Swimming for Total Fitness: A Complete Program for Swimming Stronger, Faster and Better' by Jane Katz

Bryan Derballa for The Wall Street Journal

cations that had upset her stomach. Instead, she increased her daily insulin injections. She also resumed eating carbohydrates. Within weeks, her energy was back. "At first I was relieved and then I was very angry," she says. "Nobody should have to go to four doctors to get a diagnosis for something that isn't that difficult to diagnose."

Type 1 diabetes is an autoimmune disorder that attacks the body's ability to make insulin, which allows the body to properly process glucose. The disorder, once called juvenile diabetes, begins mainly in children and adolescents, but is increasingly occurring in adults. Type 1 diabetics need daily insulin injections to survive. If patients manage their blood-sugar levels well, they can live for decades without encountering the dangerous complications associated with the disease.

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