(continued from page 3)
Kaminsky found in a small study sample that levels of a specific epigenetic alteration in SKA2 were considerably elevated in those who died by suicide. A DNA methyl group that wasn’t supposed to be there had added itself to the gene.

“We think SKA2 methylation may be causing a failure of the brain to shut down the stress response,” says Kaminsky.

Now, in a larger study, Kaminsky and Johns Hopkins psychiatric epidemiologist Holly Wilcox determined that gene variations at SKA2 are associated with risk of developing post-traumatic stress disorder following stressful events. Importantly, independent research groups around the country have recently begun to publish replications of the SKA2 associations.

Using an existing patient data set of DNA methylation at SKA2, the researchers found that trauma or emotional abuse dating back many years may interact with SKA2 gene DNA methylation. The resulting biological changes appear to modulate the sensitivity of the brain’s stress circuitry.

Wilcox points out that the field of epigenetics—and understanding precisely how genes control behavior and get switched on and off—“seems to add another layer of complexity to our understanding of how genetic and environmental factors influence risk for suicide.”

Kaminsky, however, envisions a day in the future when a combination of clinical and biological information will be used to guide treatment decisions. “Bit by bit,” he says, “we’re putting together pieces of this puzzle.”

Learn more about Kaminsky’s research: bit.ly/kaminskyresearchlab.
On a Mission to Treat Addictions

At the height of his career, Tom Bond had a prestigious job, a house, a company car and a big salary. But the Harford County native says he never felt fulfilled by his fancy job and soon turned to drugs and alcohol. After losing several good jobs over a dozen years, he began bartending, a lifestyle that supported his addiction to cocaine. Soon he was also using heroin and eventually became destitute and homeless.

Bond found an abandoned house in East Baltimore, where he lived until he got locked up. His cellmate told him about the Helping Up Mission, a nonprofit, faith-based mission that offers a residential addictions recovery program. Bond perk ed up. “I didn’t want to spend another winter without a shower or a roof over my head,” he says.

Today, 13 years since that encounter, Bond is not only clean, but as director of programs for the mission, he’s helped thousands of other homeless men to reclaim their lives through the shelter’s 12-step recovery program, daily classes, and career and spiritual guidance. And for the past several years, Bond and treatment coordinator Michael Gray—another recovering addict—have shored up the mission’s efforts through a partnership with Johns Hopkins addictions experts, who come to the site daily to provide supplemental care.

Launched in 2012, in response to the mission’s request for Johns Hopkins addictions expertise, the Cornerstone Program merges Johns Hopkins’ established clinical addictions treatment with the mission’s spiritual supportive community. “The program enables both organizations to draw from each other’s strengths in a novel way,” says Cornerstone director Denis Antoine, who also directs Johns Hopkins’ Motivated Behaviors Unit, an eight-bed inpatient psychiatric program. “You meet the people where they are. If that includes spirituality and church activities, that’s incorporated.”

Staffed by a clinical supervisor, patient coordinator and three counselors, Cornerstone is a five-day-a-week program that uses individual and group psychotherapy and an evidence-based system of evaluation and reward. Program leaders give various incentives to clients for completed goals, like four hours of exercise and regular attendance.

About 85 percent of the men are referred for psychiatric counseling beyond the mission’s program. And some will require inpatient detoxification. “Many clients have comorbidities like depression, bipolar disorder and HIV—making it important to get the person better now, but also for the long term,” says Antoine.

How does one measure success in a population estimated to experience a 50 percent to 90 percent likelihood of relapse? “The high rate of attendance and just completing the program,” Antoine says, “are significant first steps.”

Last April, on the day civil unrest erupted in Baltimore, Antoine stopped by the mission to make sure everyone was OK. People—many with close ties to the community—were tempted to go out but worried that if they did, they’d resume using. Antoine saw a teaching moment. “Whether you experience unrest, a parent dying or divorce,” he told the men, “the key is to ask, how am I going to find a way to stay away from the drugs?”

There’s no magic bullet for addiction, says Bond. “There’s a lot of heartache but a lot of amazing success. In this community within a community, I’m OK, I’m loved, and I can become my true self.”

The Uneven Road to Recovery

For Helping Up Mission treatment coordinator Michael Gray, addiction began in the late 1960s, when he started using recreationally but ended up with “a lifestyle” that broke up his marriage and ruined his career as a longshoreman. Desperate for help, Gray came to the mission, completed its program, stayed clean for 10 years, relapsed in 2011, then returned in 2012 dealing with serious medical problems. Among the first to complete the Cornerstone program, Gray admits he dreaded the thought of it. “But once I got to know the counselors—a bunch of people who really want to help—I started to relax,” he says. “They gave me practical coping skills for daily life.”

PREVALENCE OF CLIENT DRUG USE WITHIN 30 DAYS PRIOR TO PROGRAM ENTRY:

- Benzodiazepines/Sedatives 10%
- Marijuana 17%
- Alcohol 33%
- Cocaine 42%
- Opioids 45%

Learn more about the Cornerstone Program: 410-550-2796 and more about the Motivated Behaviors Unit: bit.ly/JHmotivatedbehaviorsunit.
Impulsivity and Binge-Eating in Children: Connecting the Dots

In recent years, pediatric psychiatrist Shauna P. Reinblatt began seeing a trend in her clinics: More children with attention deficit and hyperactivity disorder (ADHD) are also obese, even though their constant activity and the stimulants used to treat ADHD typically cause these children to lose weight. So, Reinblatt wondered, could impulsive behaviors be triggering binge eating?

Her search for studies on the topic turned up few. There are data linking ADHD and adult binge eating—the most common eating disorder in adults—but there is scant information on children with that problem, which Reinblatt prefers to describe as loss of control eating syndrome (LOC-ES).

Binge eating, she explains, is harder to define and standardize in children of different ages because of growth spurts, which can naturally boost appetites. LOC-ES “means these kids are eating considerably more than their peers and are unable to control what or how much is being consumed,” says Reinblatt, who founded the Johns Hopkins Child Psychiatry Overeating Clinic for children and teens.

Reinblatt speculated about possible shared mechanisms in these children, such as impulse control deficits that are at play in both ADHD and LOC-ES. A recent study she led validates that hunch.

“Loss of control eating means these kids are eating considerably more than their peers and are unable to control what or how much is being consumed.” —SHAUNA P. REINBLATT

In the study of 79 children ages 8 to 14 whose body mass index was over the fifth percentile, the odds of LOC-ES were increased 12 times for children with ADHD. In addition, children with LOC-ES had much greater impulse control deficits during performance-based neuropsychological tests and on parent reports than children without LOC-ES.

Though the study’s findings suggest a link between ADHD and disinhibited eating, Reinblatt cautions that the roots of any underlying problem remain obscure, and longitudinal studies are needed. Children with ADHD who also have LOC-ES might have a more severe form of ADHD marked by more episodes of impulsive behavior. Alternatively, she says, children with both ADHD and LOC-ES could share an underlying risk factor, such as genetic predisposition to impulsivity.

Associated symptoms, such as negative feelings and secrecy, also may play a role in this wider definition of binge eating, says Reinblatt. During her treatment sessions with parents and children, for example, a parent might report that the child regularly sneaks food. “We need to find out if these kids feel guilty or embarrassed about eating,” she says.

Ultimately, Reinblatt hopes to identify any underlying mechanism connecting ADHD and loss of control eating “to figure out what’s going on in these cases and better understand when to use stimulants, cognitive behavioral therapy or other treatments.” In the meantime, she adds, clinicians who see children with ADHD should be mindful that they may be binging.

Questions to Ask Parents of Children with Disordered, Impulsive Eating

Does the child find it difficult to stop eating, like a train rolling down a hill?

Does he or she eat impulsively?

Are there three or more episodes of binge eating?

How does the child respond when a parent puts limits on eating?

Does he or she eat in secret?

Is the child aware that he or she is eating more than others?

Does the child seem to feel guilty or embarrassed about eating?

A Sampling of Brain Research and Thinking Underway at Johns Hopkins


The Signature of Blast Neurotrauma?

A century after the first reported case of shell shock, an ailment that has afflicted soldiers since World War I, Johns Hopkins psychiatrist and neuropathologist Vassilis Koliatsos and colleagues have found what may be the distinct pattern in the brain associated with a blast injury.

These hidden brain injuries may play a role in the psychological and social problems some veterans face after coming home.

Autopsies of combat veterans who survived improvised explosive devices (IEDs) and later died of other causes reveal a unique pattern of injuries in parts of the brain involved in decision making, memory, reasoning and other executive functions.

As shown in the images above, the honeycomb pattern of IED survivors’ brain injury (A) is very different from the effects of motor vehicle crashes (B) or opiate overdoses (C).

Combining Genes, Epigenetics and Stress Responses to Study Suicide and PTSD

It’s been well known for millennia that stressful events exert important influences on human behavior. Patients with clinical depression are no exception, and when their depression is severe, they have higher rates of suicide.

Bringing new scientific insight to these long-established observations, however, is recent work by Zachary Kaminsky and his collaborators, who have identified a protein, SKA2, that appears to be a link in the stress response pathway.

Although any clinical application is likely many years in the future, says Kaminsky, the studies are providing an intriguing window on how differences in individuals’ stress responses may affect their behavior and their inclination to respond maladaptively to stressful events.

What Kaminsky and his team—whose research in Johns Hopkins’ Department of Psychiatry and Behavioral Sciences focuses on identifying epigenetic factors underlying mood disorders—have found is that SKA2 and epigenetic regulation of the gene that makes it are reduced in postmortem brains of suicide victims. They have also shown in living patients with depression that one form of the gene for SKA2 has been partially shut down by the epigenetic mechanism known as methylation (the most common way in which a gene can be inhibited or “turned off”) in depressed patients with suicidal ideation.

Normally, adrenaline and the stress hormone cortisol flood through the body under stressful conditions, and when the stress subsides, a normal SKA2 protein helps shut down cortisol secretion. Many of the brain samples of people who have attempted or died by suicide, says Kaminsky, have abnormal SKA2 expression in their prefrontal cortex—the part of the brain involved in suppressing negative thoughts and impulsive behavior. While comparing blood and postmortem brain samples from healthy people and those with a history of psychiatric disorders, (continued on back page)