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UNIVERSITY OF ALBERTA
ALUMNI MAGAZINE

THE HUNT FOR HEP C

A blood-borne illness was making millions sick, but no one could find the culprit. Inside the seven-year search to identify a mystery virus.

And what it takes to earn a Nobel Prize.

thesis

DIVING DEEP INTO ONE IDEA

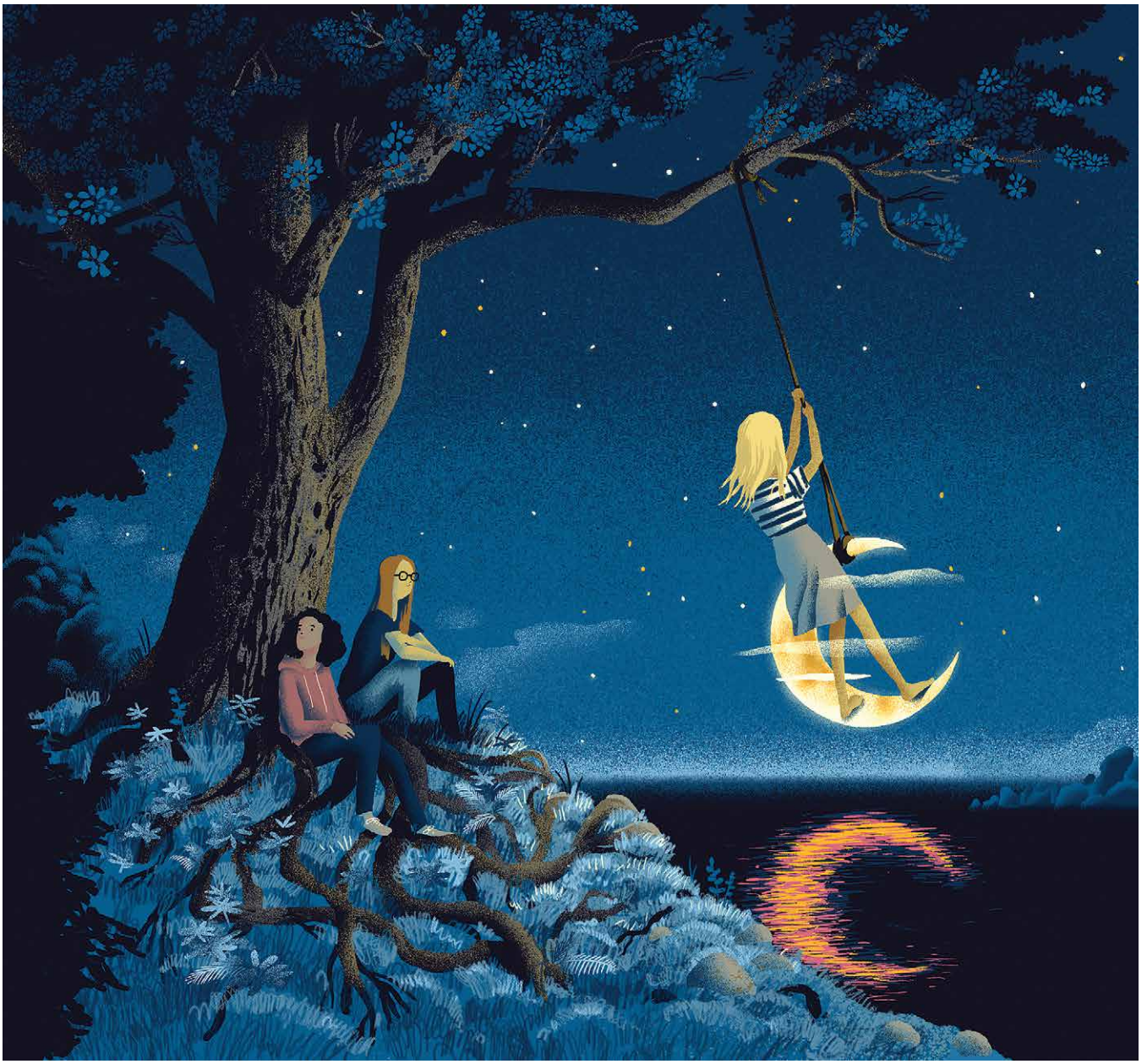


ILLUSTRATION BY BYRON EGGENSCHWILER

Who is 'Us,' Anyway?

We live in groups that overlap: families, friends, societies, biological systems. The border of one can blur into the next

WHEN WE TALK ABOUT US, there's an implied edge at which our group stops and another begins. Sometimes it's a fine line. Being part of a group can mean communicating better and looking harder at the mechanisms that tie us. What happens when we choose to expand the concept of us, to switch places with our mentors, to include other creatures, or to acknowledge the parts of us we do not understand? Read on to find out. ■

Where I Stop and You Start

What happens when the idea of "us" grows, allowing it to encompass a little more than it did before?

THE WORD *US*, AND ITS subjective form, *we*, have never been more abundant. Or weird. They poke up everywhere: *We need to come together. This isn't us. Is this who we are?* The concept of *us* invokes a collective that has become more distant and abstract with each strange, passing week of pandemic life.

That first-person plural has always been a bit slippery. It defines who is a part of ourselves and, importantly, who is not. It also speaks an awkward assumption into being: that we have something, like an experience or a belief, in common. But how could we ever be sure? Maybe this is why it has always been easier to define *them*. And, when the outside world looks more unfamiliar and unsafe, it's tempting, even comforting, to tighten into a tidy first-person singular.

But as **Emily Hoven**, '16 BA(Hons), has realized, there's a trippy and life-affirming world out there when you expand your bubble of "us." In her case, it tastes like fresh bread.

The PhD dissertation she's writing at the U of A philosophizes how fermenting and baking sourdough — from the rituals of feeding and discarding the starter to sharing loaves with friends — can teach us a lot about taking care of our communities and ourselves. It encourages us not only to imagine the invisible, but also to imagine the invisible as part of us.

Hoven took up sourdough on her therapist's recommendation — tending for something else, the idea was, would help her take better care of herself. It quickly became more than following a recipe; it became a relationship. Before handwashing was paramount during the pandemic, Hoven was cognizant of the different cleaning products she used at home — she didn't want to disrupt the delicate balance of microbes proliferating in her starter jar. She has felt real distress when the starter has looked sick, real gratitude when she eats her bread.

"Working with sourdough has made me think in totally different ways about the boundaries of my body," Hoven says, mentioning a North Carolina State University study. It found the microbiome — the community of microscopic living things — on sourdough bakers' hands more closely resembles the sourdough microbiome than that of non-bakers' hands. "It has made me conscious of the fact that I'm surrounded by all this other life and that the things I do have implications for this other life around me."

It's true: the human body contains as many or more cells of other species, microbes, than actual human cells. When reflecting on this fact, **Justine Karst**, '99 BSc(EnvSci), asks the existentially mortifying question: "Where do we start and the microbes begin?"

Karst is an associate professor in the Faculty of ALES and an ecologist who studies mycorrhiza: the relationship between plant and fungus. (Mycorrhiza is to plant and fungus, as marriage is to spouses.) Trees owe their growth to massive underground networks of fungi. The fungi supply the trees with vital nitrogen from the soil and allow them to send underground signals to each other. In return, the trees supply the fungi with carbon. Much like people and our microbes — or people and anything else, for that matter — the actual cells of fungi and trees are so enmeshed that it's hard to tell where the trees end and the fungi begin. And this connectedness is important. A PhD student in Karst's lab recently found that when trees are more connected to other trees via fungal networks, they grow taller and stronger.

But Karst cautions against romanticizing mycorrhiza — fungi and trees aren't perfect partners. If there's little nitrogen in the soil, the fungi will hoard it. They're still individuals, after all, and don't exist just to serve the trees.

Karst says we can extend this idea to people. "We're all individuals and we're all active agents in our lives," she says. "But you cannot explain our actions in isolation from the individuals that are around us."

ILLUSTRATION BY BYRON EGGENSCHWILER

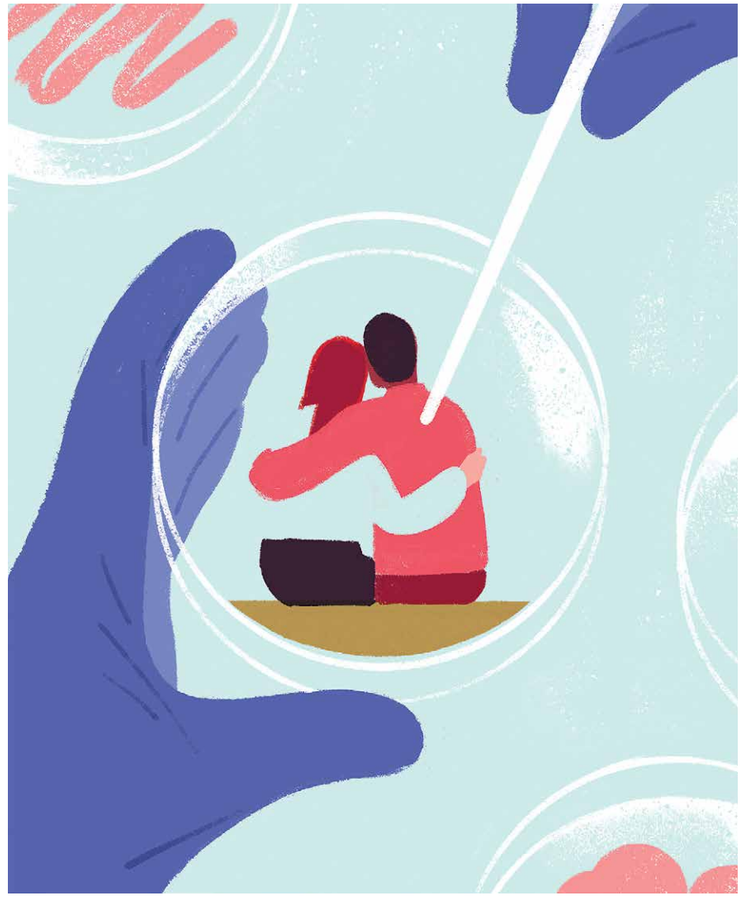
ILLUSTRATION BY CHRISTY LUNDY

"We're all individuals and we're all active agents in our lives. But you cannot explain our actions in isolation from the individuals that are around us."

Justine Karst,
associate professor, Faculty of ALES

Realizing the true connectedness of our world is mind-blowing. But this way of thinking might only be mind-blowing to some cultures. As **Patricia Makokis**, '79 BEd, reminds us in her essay, "Our Collective Mother and Why We Should All Care" (see p. 12), people have understood the true enmeshment of plants and animals for time immemorial. Once we accept everything living — and even non-living — as part of *us*, she writes, it's hard not to feel a greater sense of responsibility to one another. A tree becomes more than something merely beautiful or fascinating, but something deserving of our care.

Our connectedness raises the stakes on what we owe each other. It's more than a thought experiment, the quaint acid trip of imagining all of our microbes tangling with other microbes, the invisible vast networks beneath our feet — invisible only because of where we're standing. Seeing the deeply connected "us" as it really is asks more of us, but it's where the real work begins. —**KATE BLACK**, '16 BA



A MYSTERY WRAPPED IN A HORMONE

Love brings us together, but what brings love?

YOUR EYES MEET ACROSS A CROWDED app. There's a spark, a swipe right and romance begins. Chemicals flood your brain, your heart pounds. You feel a connection to the other person. Maybe you write a poem. But if it falls flat, don't blame the chemicals in your head — not even oxytocin, the hormone and neurotransmitter known as the "love hormone."

Oxytocin is involved in pair bonding. It's on hand when you feel empathy and trust, and when you have sex. Later, oxytocin is on the scene for childbirth and breastfeeding. But it's not calling the shots. "This is one of those things that people who study hormones and behaviour are always struggling with, this idea that the hormones are like marionette strings," says Pete Hurd, professor of psychology and neuroscience in the Faculty of Science.

While it may be tempting to fault hormones, you and your behaviour are pulling all the strings. "How you act changes your hormones, and how you behave and think is more important. Your hormones will follow along afterwards," says Hurd. "The take-home lesson is that policing your thoughts and how you act is what drives the emotion of love."

We know that love can lead to propagating genes and keeping evolution rolling, but scientists have not entirely figured out the emotional part. "I would say that love is still a mystery," says Hurd. "I don't know that neurobiology has any deeper understanding of love than really good novelists have." —**JENNIFER ALLFORD**, '84 BA

When the Master Makes Mistakes

What mentors have to learn from their mentees

FROM FAIRY GODMOTHERS TO wise wizards, many of our favourite stories feature sage advisers lending a helping hand to the less experienced. These relationships form in real life, too, albeit with less wand-waving. Students and new professionals seek out mentors with the hope they'll learn skills, build confidence and make connections. It's clear what motivates the mentee to join the relationship—but what about the mentor?

Last summer, **Shelly Jun**, '15 BSc, '17 MSc, mentored a U of A student who had received funding through the Undergraduate Research Initiative (URI). Jun was helping her as the student looked at how some of the URI's partner agencies use evaluation to inform their programs.

Jun, a research co-ordinator with the Community-University Partnership for the Study of Children, Youth, and Families, says she doesn't consider herself a natural mentor. But she made the leap for a simple reason: she remembered how much mentorship had meant to her when she was a student. Like her mentee, Jun had also received funding and mentorship through the URI, an experience that helped her get into graduate school.

Here are four things Jun learned from her experiences as a mentee and mentor.

1. Put the mentee first.
As a mentee, Jun learned more from supervisors who treated her like a colleague rather than an employee. "What probably affected me the most, and encouraged me to follow their example, were the mentors who were invested in my growth," she says.

2. Don't think you're Yoda.
Once she started mentoring, Jun quickly realized she would not just be wisely doling out advice. In fact, being a mentor brought up some personal challenges, she says. "It helped me identify areas for personal development, including patience and active listening."

3. It's not your project to perfect.
Jun noticed her own hesitations to let go when it came to mentees' projects. "It's easy to fall into the mindset of wanting to do all the work myself," she says. "But I'm getting better at delegating and being patient with the iterative nature of the process."

4. It's a beautiful circle.
While a mentee may feel intimidated by their more-experienced colleague, Jun says the mentor should be equally ready to learn. "A lot of my learning has been around seeing my flaws and then having the opportunity to try again. And try again."—ANNA HOLTBY

A TIME TO TALK

When a piece of the communication puzzle—the ability to talk—is missing, innovative solutions can help

THIRTEEN-YEAR-OLD MARC BOUTILIER understands the challenges of not being able to speak in a world where oral communication is the norm. Most especially, he knows the pain and isolation of not being heard.

He also knows the difference that communication devices and strategies can make. Boutilier, who has autism spectrum disorder and apraxia, uses an augmentative and alternative communication (AAC) device, which electronically speaks the words he types.

"I like that I can talk," he says. But it's hard when people are impatient.

"If people are not familiar with Marc, they tend to dismiss his slow typing or his playing with the keys as, 'Oh, he really doesn't have anything of importance to say,'" says his mother, **Gail Boutilier**, '85 BEd. "They won't wait. They will just move on."

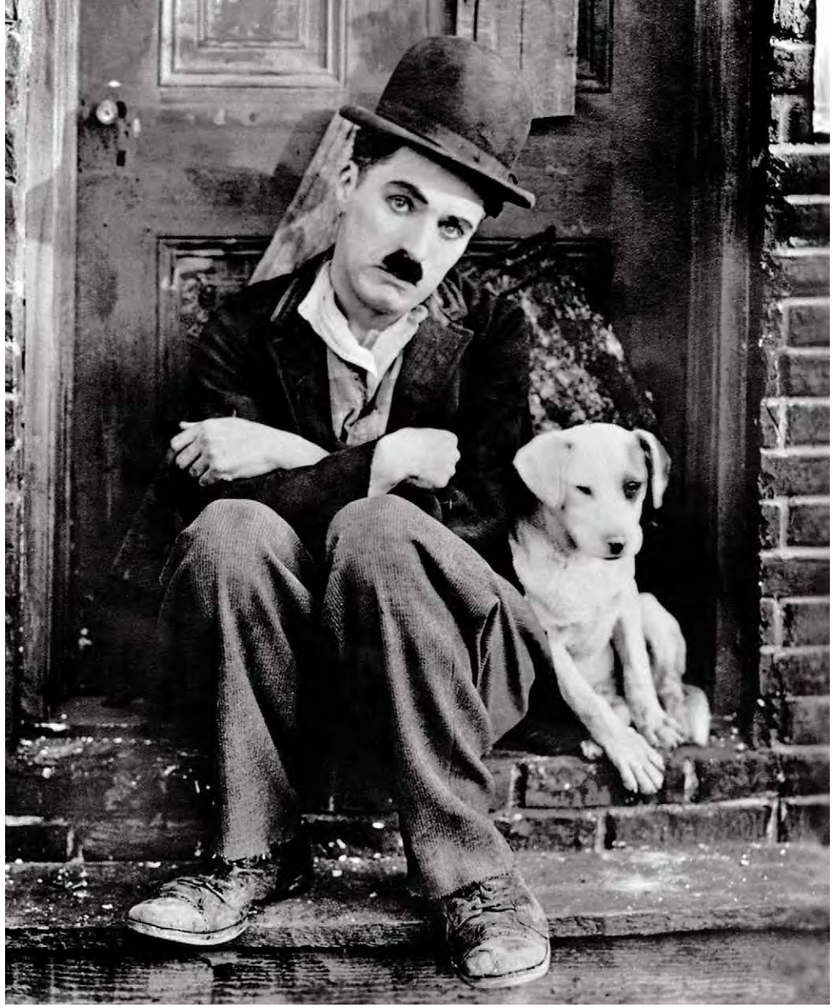
Some people don't let him finish typing, instead assuming they know what he is trying to say. Others jump in to type his words for him. "This really doesn't give Marc a sense his voice matters."

Support has come through AAC Camp Alberta. Offered through the U of A's Faculty of Rehabilitation Medicine and March of Dimes Canada, the annual camp brings together kids who use communication devices and teaches them new ways to use them. "It helped Marc see he wasn't alone or strange because he used a device to speak," Gail says. The camp also offers fun activities, like swimming, swinging, music and campfires. In 2020, the camp was virtual with activities like building living room forts, crafts and dancing.

"The primary purpose is to provide a camp experience to children who use AAC, in an environment where it is supported and valued," says Karen Pollock, an expert in speech-language pathology at the U of A and co-founder and director of the camp. Sessions are offered for parents and siblings, too. "AAC is a game changer that opens up so much."

Boutilier's mother, Gail, agrees. "There are lots of other people in this world who speak this way. No one treated Marc as a novelty or like he was less intelligent because he didn't use the spoken word."

The benefits don't stop with the campers. Pollock and her students build a body of research about how campers benefit and the students gain valuable experience. "We've been approached by families and professionals in other communities who are interested in setting up similar camps," says Pollock. "AAC Camp is one of the most rewarding experiences of my career."—**JENNA C. HOFF**, '02 BSC(PT)



ARCHIVIO GBB / ALAMY STOCK PHOTO

Dogs Become Us

From lapdogs to sentries, our canines are part of many cultures in a way no other creature is

THE INCREDIBLE JOURNEY, *Marley and Me*, *Where the Red Fern Grows*: dog stories run deep in the weave of our cultural tapestry, back into the mists of time to the first night we shared a campfire with our four-legged friends.

Not every human culture views dogs in the same way, but research demonstrates a long interspecies relationship. A study published recently in *Science* undertook a genetic analysis of the remains of 27 ancient dogs. "Right after the end of the ice age, there's already quite a bit of differentiation in these dogs, which means domestication originated well into the ice age, maybe 15,000 years ago," says Robert Losey, an archeologist in the Faculty of Arts and one of the study's 57 international authors.

Was it just propinquity? Are we opportunists, who duped the kindest and mildest of wolves into guarding our homes in exchange for a warm spot by the fire and some leftovers? Or did some wolfish ancestor size us up and go for the long game: "Kill yourself a man and you'll eat for a day, but become his friend and you'll eat for generations."

Think back: what's the first dog story you remember? With some cultural exceptions, people's first experience of dogs arises within a context of, "we love dogs, dogs love us." We might love other animals, too, but none finds more roles in society. Working dogs have partnered with pastoralists from ancient times, according to Losey. Guard dogs and the hounds of war have gone to battle beside us. Lapdogs, ever daintier and more elegant, serve no purpose other than to adorn loving keepers.

No other animal shows as broad a range of size, temperament and abilities. Can you imagine a sheep cat, minding the flocks? A seeing-eye cat, patiently leading a human through their days? It's the cats who set the agenda, and their domestic forms are remarkably similar.

Dogs adapt to our evolving needs and become teacup poodles or Tibetan mastiffs. Dogs actually listen, every owner swears it. Dogs lead from the heart and, once given, that heart will give its last beat in loyalty. Paradoxically, invoking the species' name has long been used as an insult, to imply that a human lacks will, industry or a kind nature.

So how did dogs become part of us? Trees and their associated fungi thrive together, bonded via mycelia at the roots. Perhaps dogs and humans are likewise symbiotic. Maybe there's a dog-shaped connection in our hearts that we're born with, just waiting for dogkind to attach, so that we can grow kindness.

Losey says the team's research speaks to the length of the relationship, pointing to the fact that changes in dog genetics tend to mirror changes in human genetics, "particularly related to major population movements." His studies cannot reveal if the two species' shared long walk through time was first sparked by necessity—anyway, affection soon followed. "People clearly had emotional attachments to their dogs from the very beginning," he says. And just as fungi strengthen the root systems of trees, stories and research tell us that dogs strengthen us, heart first.
—**ANNA MARIE SEWELL**, '91 BA(SPEC)