Waisman Center | University of Wisconsin-Madison

ANNUAL REPORT 2020



Advancing knowledge of human development, developmental disabilities, and neurodegenerative diseases



From the Director

In these times of uncertainty, one thing remains steadfast: our commitment to advancing research on developmental disabilities and neurodegenerative diseases and providing clinical services and supports to individuals with disabilities and their families. While there is no question that we are facing a crisis of unprecedented scale, we shouldn't forget that with every challenge comes new opportunities that lead us to a better future. Indeed, this is what is happening at the Waisman Center.

The pages of this year's annual report highlight how we – even in the most unexpected of scenarios – continue our core mission of research, service, training, and outreach.

I am proud of the work we have accomplished this year. Years like this one serve as a reminder to me that teamwork and community are our greatest assets in overcoming obstacles. We work together in our pursuit of knowledge, in the care we provide, and in the lives we touch.

On behalf of the entire Waisman community, thank you for your support of the important work that we do and the people we serve.

Best wishes for 2021.

Qiang Chang, PhD Director, Waisman Center Profesor, Medical Genetics & Neurology

Waisman Center Board of Visitors & Friends of the Waisman Center

The **Waisman Board of Visitors** was established in 1996 to: provide perspective and important connections with the business community and public policy makers; assist the Waisman Center in strengthening partnerships with the private sector; provide an advocacy network; and guide major fundraising efforts.

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Founded in 1975, the **Friends of the Waisman Center** is a nonprofit 501(c)(3) organization that supports the Waisman Center through fundraising, volunteer efforts, and community outreach. The Friends raise awareness and support for the center through three community fundraisers: a spring benefit; a golf outing; and the Waisman Whirl Run, Walk, & Roll for All Abilities.

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When research goes remote: adapting studies in the face of COVID-19

When the very challenge comes new opportunities. When the COVID-19 pandemic hit the U.S. in March 2020, much of the country went on lock-down with only essential services and operations remaining. The Waisman Center was no exception. Essential operations continued in the building and hundreds of employees transitioned to working from home. While clinic operations and appointments transferred to newly-established telehealth platforms, the circumstances posed unique challenges for the Waisman Center's robust

biobehavioral research programs. The center's biological research continued fairly seamlessly at reduced capacity, but behavioral studies, which rely heavily on data collection from in-person visits, faced major obstacles. The challenges proved to be an opportunity for developing innovative new ways to continue research, transitioning studies that had traditionally been limited to in-person interactions to now accommodate remote data collection.

"Normally in a year, we would bring about a thousand families to the Waisman Center to



The Infant Learning Lab, directed by Jenny Saffran, PhD, is one of several Waisman labs to transition its in-person research studies to remote participation.

participate in our research," says Jenny Saffran, PhD, a Waisman investigator and professor of psychology. Saffran runs the Infant Learning Lab, which studies how infants and young children learn language and track speech. In a typical research environment, her work relies on being able to observe children's physical behavior. But since it is unsafe to go about research in the usual way, she had to adapt.

"When the pandemic halted in-person studies, researchers began exploring whether it would be feasible to run study sessions using Zoom," says Robert Olson, PhD, an engineer with the Waisman Center's Clinical Translational Core (CTC). The core provides investigators like Saffran with access to a broad range of supports for conducting translational research focused on human development and intellectual and developmental disabilities. The CTC has proven to be an invaluable resource during such an unprecedented time. For Saffran, who was already working with Olson on mechanisms for remote research, the pandemic accelerated the timeline to launch online data collection.

Saffran's current research examines how much infants understand of the conversations going on around them. "We're basically trying to understand what babies know about language before they can really talk," she says. "The way we try to get inside their heads is to show them images and have them listen to people talking, while we measure whether their eye gaze seems to reflect an understanding of the language." For example, if an infant is looking at a computer screen with a picture of a cat and a ball on it, and an adult says, "Where's the cat?", the researchers then use an eye gaze device to time how long it takes for the participant's gaze to shift to the cat.

An eye tracker is a device that tracks and records a person's eye movement based on where the user is looking on a computer screen. It is highly effective for infants and young children as well as individuals with severe physical or communication challenges.

Together, Saffran and Olson were able to create a program that now works on multiple platforms and operating systems, allowing individuals to participate in Saffran's research safely from home. "Instead of having the baby come into the lab and sit on their parent's lap and look at our screen and listen to our speech, we're trying to do that via web browsers and video camera technology," says Saffran.

Listening for opportunities

Waisman investigator Katie Hustad, PhD, a professor of communication sciences and disorders, found herself in a similar situation once the pandemic struck. Hustad studies communication development in children with cerebral palsy (CP). As part of her research, she records speech and language samples of children with CP. About half of all children and adults with CP have significant speech production challenges.

Hustad uses the audio samples to identify early predictors of age-specific outcomes. Her goal is to better determine when a child with CP may be expected to formulate certain words or sounds and

"If online research turns out to be as fruitful as some of my colleagues around the country are reporting, I think it just might give us another tool to add to our toolbox of different ways that we do our research."

Jenny Saffran, PhD

"We continue to develop new variations of the task as it appears remote listening will be the primary way new experimental data can be collected for an extended period."



Katie Hustad, PhD

identify therapies that can improve outcomes. She has been following the same children over time for close to 15 years. Losing the ability to track development in those children through in-person visits to the Waisman Center had dire consequences for the research. Although the research had the potential to be moved online and into participants' homes for some of the information being collected, she admits she was tentative to make that switch before ultimately having no choice. "There are just so many rogue variables in that mix," she says of participating in research from home. "You don't know what the noise is like in the background, their Internet bandwidth, other distractions in the environment, you can't control the recording levels when audio and video are being captured remotely. I was worried about 15 years of data that tell a longitudinal story being compromised through the use of the internet," she adds.

Prior to late March, Hustad recruited listeners – usually college students – to listen to those audio files from children with CP, and write down what they think the child said. The transcript is then scored to determine children's speech intelligibility. These listener responses to children's speech form the foundation for understanding functional change in speech abilities over time.

"We'd have one set of listeners listen to a child when they're 3 years old, then another set of listeners hear the same child when they're 4, and when they're 5, and so on," she says. "We can then track trajectories of change over time in speech intelligibility development for the kids in our study." With this data, she is able to determine speech growth patterns including the time points when children are growing the most rapidly, and the time points when growth starts to slow down and even plateau.

"Before COVID, this would have been done by bringing listeners into a sound booth at the Waisman Center," says Olson, who also worked with Hustad to transfer her research online. "We obviously can't do that now."

Hustad worked with Olson to ensure that both the audio and the video would be of a high enough quality to properly assess participants' speech. "Rob has done amazing work with building out our capacity to remotely collect data from listeners," says Hustad. "The data feeds right back into our database at the Waisman Center, which automatically stores and scores all of our results."

Olson admits that before COVID, the online portion of Hustad's research was not meant to be the entire experiment, but drastic times call for drastic measures.

"Originally, the plan was for something that was fairly narrow in scope," he says. "But with COVID, I think the realization came that remote listening sessions would have to be a much more essential part of the research."



"Originally, the plan was for something that was fairly narrow in scope, but with COVID, I think the realization came that remote listening sessions would have to be a much more essential part of the research."

Rob Olson, PhD

Unexplored research areas

Olson was able to set-up the remote program to gather information from listeners by the end of May and Hustad began collecting data in June. To date, collection of listener data is going well. However, collecting data from children with CP using remote tools is much more complicated.

"The way people communicate is fundamentally different when you can actually sit face-to-face," says Hustad. "Working remotely, you can get a lot of information, but all you can see is what the camera is showing you, so you're really limited in your perceptual scope."

Furthermore, her listeners are getting a different quality of audio than they would in a controlled laboratory. Questions have arisen about the validity of those incoming results. "Is an online listener equivalent to a lab listener?" she asks. "Those are studies that we're going to have to do in order to determine if we can combine our online data from the listeners."

Minor tweaks and adjustments are ongoing. "We continue to develop new variations of the task as it appears remote listening will be the primary way new experimental data can be collected for an extended period," Hustad says. "It's better than nothing, but we're really eager to see our kids again."

Unexpected benefits

Saffran's lab began doing online research October 1 and she says it has been going well.

An unexpected result of having to move research online is the expanded breadth of accessibility researchers now have to other populations and the ability to target demographics outside of the greater Madison area.

"We're hoping that the online platform may allow us to reach families we might not otherwise reach or families who might not be comfortable coming to a college campus but are really interested in participating in research," Saffran says. She plans to advertise her studies in more diverse areas such as Milwaukee. "If we can actually tap into those participant populations and other places, we might be able to actually investigate or try to answer research questions that are difficult to answer with the population of infants that we have access to here!"

Whatever happens moving forward, Olson and the CTC will continue to work with Waisman Center researchers to adapt and expand research participation. "If online research turns out to be as fruitful as some of my colleagues around the country are reporting," Saffran says, "I think it just might give us another tool to add to our toolbox of different ways that we do our research."

Building community connection: from feedmill to autism therapy center

In the shadow of the Fennimore water tower sits a nondescript metal building. The onceabandoned former feed mill has now become The Learning Center, a unique resource for youth with autism and their families. Therapy rooms and sensory-friendly spaces, equipment, toys, and lighting are thoughtfully configured. Most rural communities don't have a resource like this, but most communities don't have someone like Rose Cutting.

"Every time I talked with somebody about buying the building, they looked at me one of two ways: like I'm crazy, or I'm a genius," Cutting says.

A mother herself to a teenager with autism, Cutting is the executive director of Aiming for Acceptance (A4A), a non-profit that provides therapies and resources to individuals with autism or sensory processing disorders in southwestern Wisconsin. A4A is housed in The Learning Center.

Cutting set up shop in the space in 2018. Shortly thereafter, she attended an autism conference where she made an integral connection with Gail Chödrön, PhD, the coordinator of community training and technical assistance activities within the University Center for Excellence in Developmental Disabilities (UCEDD) at the Waisman Center. The UCEDD oversees a broad range of the Waisman Center's outreach, service, and training programs. Chödrön was giving a presentation on transitioning children with developmental delays into the school system.

After the presentation, Cutting introduced herself to Chödrön and says that, from there, a great relationship started between A4A and the UCEDD.



Rose Cutting, at The Learning Center in Fennimore, Wisconsin



Aiming for Acceptance (A4A) operates out of the Learning Center in Fennimore, Wisconsin. A4A provides autism therapy services and programing in a sensory-friendly space.

As Cutting worked on establishing her center in Fennimore, the UCEDD provided the knowledge base and access to resources, support, and information on evidence-based practices. "I don't have to keep trying to educate myself on these things," Cutting says. "I can call them and I can say, without any judgment, 'I need help.' And they say, 'What do you need, Rose?'"

In working with the UCEDD, Cutting was also introduced to many people working with developmental disabilities including other parents, like her, who needed resources for their children.

Training and technical assistance

The UCEDD training and technical assistance efforts have three main goals: increase the knowledge and skills of professionals and individuals with developmental disabilities and their families through training; make that training accessible to people across the state; and provide problem solving assistance to programs or agencies to improve their services, outcomes, and policies.

According to Chödrön, the combination of both training and technical assistance is important to "move the community forward and make sure that we're able to support people with disabilities no matter where they are and especially in underserved areas." Areas like Cutting's rural community.

"We have a mission to share knowledge and training with everyone who needs it," Chödrön adds.

The community training portion of the UCEDD is designed to build knowledge and skills and provide access to information that is based on new research.

Free trainings are provided to families of individuals with disabilities, clinicians, students, or teachers. Some of those trainings are universal and could be applied anywhere – such as a new COVID-19 protocol training being rolled out through Waisman Center's Wellness Inclusion Nursing program. These kinds of trainings are performed multiple times a year in different locations throughout the state.

The UCEDD is also working on new trainings to address specific community requests such as information on access to early autism diagnosis. "We're trying to improve early identification," says Chödrön, who is co-leading a needs assessment project to identify the state of early identification and access to early intervention in Wisconsin. "We're analyzing where the gaps are and for whom there are gaps. What is the state of the state right now? Where are the barriers?"

Through the UCEDD's technical assistance efforts, Chödrön and her colleagues really get to know a community. "Technical assistance really means offering more intensive help to an organization or an agency," she says. "It's not just an individual. It's an entity and you are helping them change a practice or address a specific challenge."

Assistance can range from helping community partners secure funding to ensuring an organization is ready and able to address needs of individuals with specific disabilities. For Cutting, it means help with a few things she admits she's not so good at. "I don't have to worry about the technology part," she says gleefully. "Where it becomes work is if I have to figure out Google Docs and all that stuff. Instead, they just say, 'We're going to fill it out for you, Rose. You just need to look at it and tell us what to put in.' It's wonderful!"

Hamburger and Haircut Lead to Help

Cutting likes to say that her non-profit – and thus relationship with the Waisman Center – started with a hamburger and a haircut.

Fennimore is a small rural community of around 2,500 residents an hour and a half west of the Waisman Center. Cutting says finding access to autism-related resources in such a small town is a challenge. She recognizes that she is lucky that her son was diagnosed so early, but once he turned three, no other professionals in her area had the training to support him. They needed to wait until he was old enough to enter the school system.

"Everybody's story out here is that the K-12 school system is the only resource they have for children with autism in southwest Wisconsin," Cutting says. "And that is a little bit like playing Russian roulette because, unfortunately, some of the school districts also don't have the resources to help get the best quality of life for their students."

On New Year's Day 2016, a friend of hers went to the local bowling alley for a hamburger and learned that April was Autism Awareness Month. In a spur of the moment decision, he reserved the bowling alley for an autism awareness fundraiser in honor of Cutting's son. "Mind you, I'm not part of this conversation," Cutting says with a laugh. "I had not heard anything about it."

Later, while getting his haircut, Cutting's friend told the owners of the salon what he'd done and they asked if they could be involved as sponsors. "So that is how Aiming for Acceptance started," Cutting says.

"We started by doing these bowling fundraisers that were so successful that we had to move them to a larger bowling alley in a neighboring town. We just gave the money to schools or to parents to buy sensory items or gas cards to drive to therapy sessions. We did whatever we could because I knew I wanted the funding to stay local."

But that soon became tiresome. "Why are we giving people gas cards and stuff to drive an hour and a half to these therapies?" she asked. "Why can't we figure out a way to get these therapies here?"

This sparked the idea that if Cutting created a space right in Fennimore, all of that money that was used on gas cards would be freed up to use in other more immediate capacities. That's when she decided to rent the abandoned feed mill, build her program, and look for resources and support. Cutting is just the kind of person the UCEDD aims to help.





"It's important to move the community forward and make sure that we're able to support people with disabilities no matter where they are and especially in underserved areas."

Gail Chödrön, PhD

Focusing on community

Between July 2019 and June 2020, the UCEDD's community training and consultation work trained more than 6,000 people through 80 training sessions and partook in 700 hours of 40 technical assistance activities.

Chödrön says, for her, it's about transforming a community. "It is not our mission to offer 10, 100, 1,000 hours of trainings or technical assistance. That's not the point. The point is what that training enables to happen. How do we choose what we do with our staff time in a way that best supports the community to take the steering wheel and do what they need to do?"

Cutting emphasizes that A4A is the result of her entire community's efforts. She is still amazed at how her organization has grown. "There is no reason you should be talking to me about special needs and education or anything other than dairy cattle and agriculture," she says. "But because of the Waisman Center, we have credibility!"

With the help of the UCEDD's training and technical assistance, Cutting says she has been able to turn her non-profit into an important community resource that others seek out for assistance for individuals with special needs. Currently, 30-40 hours of therapy services and community programming are offered weekly. Families are from throughout Grant County, but Cutting plans to broaden the reach. She hopes that A4A plants strong roots in southwest Wisconsin and remains a reliable resource for many years to come.



SERVICE

Increasing accessibility: telehealth brings unexpected benefits



Jess Scott Schwoerer, MD, conducts a telehealth appointment in the Waisman Medical Genetics Clinic

The COVID-19 pandemic pivoted many daily life activities, such as work and school, to a home base. Healthcare was no exception. In March, the Waisman Center Clinics transitioned all of its services to telehealth appointments using phone and video platforms. The 10 interdisciplinary specialty clinics and the center's autism treatment program, operated in partnership with UW Health, serve more than 8,000 children with a broad range of intellectual and developmental disabilities and their families each year. While unplanned, the migration to telehealth proved to have some unexpected positive outcomes for access to healthcare.

One of the clinics, the Waisman Center Medical Genetics Clinic, gathers data on no-show appointments or late cancellations. When the pandemic started, staff in the clinic noticed some positive results that seemed to speak to the favorability of adopting telehealth services.

"We saw a pretty remarkable improvement in show rates, which increases access to genetic services," says clinic coordinator and genetic counselor Christie Turcott, MS, CGC. To everyone's surprise, they found that between April and June, the clinic's no-show/ late cancellation rates dropped from 25 percent – which was the average for 2019 – to 13 percent.



When the stats were broken down further, there was little change in late cancellations but the no-shows decreased significantly.

"Even when you look at that, we've still cut our rates in half," says Jess Scott Schwoerer, MD, director of the Medical Genetics Clinic.

The telehealth appointments run similarly in length of time to in-person visits, according to Scott Schwoerer – though there are a few slight modifications. "We have parents weigh and measure the kids for us and add to their growth chart," she says. "We can observe the children to see physical or developmental changes."

A rise in accessibility

The Waisman Center Medical Genetics Clinic is an interdisciplinary clinic for people of all ages who have suspected or known hereditary conditions, malformation syndromes or birth defects. Medical geneticists and genetic counselors provide initial diagnostic and confirmatory services, care coordination, genetic counseling, and referral. Many families come from all over the state for the clinic's specialized services.

This was the case for Kristen Peterson, a single mother of seven children, who was always on the go before the COVID pandemic. Six of Peterson's children have special needs and are seen at the Waisman Center, an hour north of their home in Janesville.

Imagine getting seven kids ready and in the car to drive an hour each way for one of them to go to a doctor's appointment. Then add to that picture additional challenges that accompany several of the children who have complex medical conditions and special needs. "It's great not having to spend the money and the time on gas and driving," Peterson says of the transition to telehealth.

Peterson's experience is not unique.

"Access to genetic services in the state and even nationwide is difficult," Scott Schwoerer says. There are less than 10 geneticists in the entire state and they are primarily located in the Madison, Milwaukee, and La Crosse areas. Families in more remote areas therefore do not have easy access to these services; patients drive up to four hours to be seen in the Medical Genetics Clinic.

Because the clinic's patients are mostly children with special needs, Turcott says they are especially sensitive to disruptions in the families' routines. "Patients are on the camera only as long as it's absolutely needed for the doctor to assess them and then they go back to whatever they were doing," she says. "I think for parents, it's a relief not to have to put their kid into a car, drive for hours and then have to deal with snacks, toys, and things to do during the visits." "We saw a pretty remarkable improvement in show rates, which increases access to genetic services."



Christie Turcott, MS, CGC

Peterson says that, as a multitasker, she is happy to be able to do other things during those appointments. "My youngest can be taking a nap while I have an appointment with one of the other kids and I don't have to worry about waking them up," she says.

Furthermore, the clinic is still able to use visual aids such as PowerPoint slides to explain complicated genetic information. "For some concepts in genetics, that's really important to have," says Waisman Center genetic counselor Sara Zoran, MS, CGC.

Scott Schwoerer adds that for families with spotty Internet connections, the clinic can flexibly move to phone appointments as well.

"We've been really pleased to see that our access has increased since the pandemic instead of decreasing," Turcott says.

Telehealth limitations

Scott Schwoerer describes the transition as a real crash course in telehealth, but it's been something that the clinic has wanted to try for a very long time.

Unfortunately, Medicaid has not always covered telehealth services, but that changed thanks to a 2019 law that allows Medicaid to cover any service that had previously been available for inperson appointments. That law is a reason why the Waisman Center Clinics have been able to implement telehealth so quickly. Turcott is also sensitive to the lack of connection that make in-person appointments preferable for some. "When there's a particularly difficult session, either with bad news or a diagnosis, not being in the room does affect my ability to provide psychosocial counseling," she says. "There are just some things that we can't provide because we're not physically there. But having some access is better than no access – especially in those difficult times for families."

Reopening doors

The Waisman Center Medical Genetics Clinic reopened again in July for in-person appointments with some slight changes. For example, parents are no longer allowed to bring anyone other than the patient to the appointment, which is difficult for families like Peterson's.

"I'm a single mom with seven kids," she says. "It makes it really hard to go to doctor appointments and not bring at least one other because most of them cannot be home by themselves."

But despite the challenges, Peterson does describe telehealth services as "a great option" and, like Scott Schwoerer, advocates for a hybrid model between inperson and telehealth appointments going forward.

"It's not a one-size-fits-all option any more for appointments," says Scott Schwoerer. "Telehealth provides more options to meet the individualized needs of patients and their families."

Thoughts of gratitude: the Willis family



The Willis family "cousin camp" attendees before they board the bus to travel to the Waisman Center for a tour in 2003.

n August 13, 2003, a coach bus pulled up to the Waisman Center. The 21 passengers all children and grandchildren of the visit's organizers, Bill and Doris Willis – were coming from Milwaukee to the center for a tour. The Waisman Center was the second stop on a day full of enrichment activities for Bill and Doris' large family as part of their annual "cousin camp." Nancy Willis, one of the couple's daughters, still has the itinerary from that day. The two-hour visit began with an introduction from then-Waisman Center director Marsha Mailick, PhD, whom Bill and Doris previously met at a UW alumni function in Florida. They kept in touch and eventually arranged for the family visit when they were all back in Wisconsin that summer.

They had no idea at that time how impactful the tour would be for their family and for the Waisman Center.

Nancy paints a picture of what Mailick's presentation included. She says they learned about Harry Waisman, for whom the center is named, and his

ground-breaking work on phenylketonuria, how the Kennedy administration created a boon for research on developmental disorders, and got an overview of the work that was then going on in the center's labs and clinics.

"All of the trips that we took were educational in some way," says the couple's daughter Sarah Snowden. Often the trips were also rooted in philanthropy. "My parents wanted to show us what they were doing with their money and the people and organizations who were being helped."

The family's experiences at the Waisman Center led Bill and Doris to donate \$460,000 to establish a fund in their name that supports new initiatives in autism, ADHD, and fragile X syndrome research.

"Mom and Dad both believed in the importance of advancing knowledge through scientific research about topics such as autism and ADHD," says Nancy. "The Waisman Center is where they believed they would get the biggest return on their philanthropic investment."

Bill passed away on May 11, 2019. He was 91 years old. Doris, who now lives in Whitewater, says she and her husband donated in part because of the need for transformative gifts to further research and in part because they liked the people they met at the Waisman Center. In learning about the work of the Waisman Center, she says many in her family "were given insight into themselves, their siblings, children, or parents." nurse, a music teacher, and a grandparent to children with autism. "Now as I reread the notes from the tour, I see them from the point of view of a grandparent." Much in the way that Bill and Doris did at the time.

The experience also inspired several of the Willis

"Mom and Dad both believed in the importance of advancing knowledge through scientific research. The Waisman Center is where they believed they would get the biggest return on their philanthropic investment."

"We were aware that some members of our family had attention deficit disorder, attention deficit hyperactivity disorder, and were on the autism spectrum," Doris says. She, as an adult, was the first one in the family to be diagnosed with attention deficit disorder.

"I remember Mom's relief at having an explanation for her being her," says Sarah. She says that Waisman staff encouraged acceptance and education. "You should not ignore yourself or the information that might help explain yourself," she recalls them saying. "One should always accept individual differences in others and in yourself."

"Since that time, I have worked with many children with attention deficit and autism spectrum disorders," says Nancy, who is a school and home grandchildren: one went on to work with children with severe developmental delays and is a therapist in Illinois; another studied art therapy in college; and another now works in education.

Cousin camp

The family's trip to the Waisman Center was part of an annual week-long summer camp that Bill and Doris set up for their very large family.

"My parents came to the idea of a 'cousin camp' as an outgrowth of trying to figure out how to be grandparents to so many grandchildren," Nancy says. Several of the family members lived across the country, so for one week every year for 20 years, Bill and Doris invited the grandchildren to their property in Wautoma and hosted a themed summer camp.



Bill and Doris Willis at a 2007 visit to the Waisman Center (left), and in Wautoma, Wisconsin in 2016

Each year the camp grew as grandchildren reached the eligible age of four," says Sarah. "Parents who were available to come worked as counselors, cooks, and activity leaders of archery, art, singing, music, or anything they wanted." Bill and Doris organized the camp to form close bonds among their five children and 18 grandchildren.

Each year's camp had a different theme ranging from bears, the circus, and holidays to sustainability, world culture, and, in the case of the Waisman Center, disabilities.

Nancy says that at least seven of the grandchildren in the family are not neurotypical and watching them all grow, develop, and interact with one another during these camps gave Bill and Doris keen insights into the children's communication or behavioral issues and their parents' concerns.

"I strongly believe that my parents' experiences with their grandchildren and the cousin camp are what piqued their interest in the work of the Waisman Center and sustained their commitment to it," Nancy says.

A legacy of service

According to Doris, her late husband "had no big ego" and "was respected for his high level of integrity." He embodied these traits both professionally, as a tax and corporate lawyer, and personally as reflected in Bill and Doris' generosity.

"My siblings and I have had the opportunity to observe how our parents thoughtfully chose to use their wealth in ways which were consistent with their values and beliefs," says Nancy. Her parents deliberately chose to invest in scientific research at places like the Waisman Center, hoping that their support would lead to new ideas and solutions to improve the lives of individuals with disabilities. "I have grandchildren and grand nieces and nephews who may be benefiting from advances in knowledge made by the Waisman Center," she says. "I am proud that my parents contributed in their own way to the ongoing work being done there."



Manufacturing pharmaceuticals for the fight against COVID-19

A isman Biomafacturing (WB) is at the forefront of the fight against COVID-19 with one vaccine and two therapeutic products in development. "Waisman Biomanufacturing's mission is to advance novel vaccines and therapeutics into early human clinical trials," says Carl Ross, MS, WB's managing director. With its state-of-the-art cleanroom facility, WB provides manufacturing and testing services to academic and industry research partners for a broad range of pharmaceuticals for phase I and phase II clinical trials. The facility, established in 2001, is a key component of the Waisman Center's efforts in translational research.

The COVID-19 vaccine project is in partnership with Heat Biologics and pivots a technology originally designed to help patients fight cancer to a potential COVID-19 vaccine. The vaccine is targeted for atrisk populations, such as the elderly and individuals with underlying health conditions. The project uses engineered human cells to present viral antigens to



the cellular arm of the immune system and generate a more robust immune response than a traditional vaccine.

Another COVID-19 project is a therapeutic that produces polyclonal recombinant antibodies to many different epitopes on the surface of the COVID-19 virus. The technology, developed by GigaGen, allows simultaneous manufacturing of more than 10,000 different antibodies identified in recovering COVID-19 patients. The approach has all the advantages of convalescent sera, while offering a robust, industrial platform similar to that used in monoclonal antibody production.

Also in production is a therapeutic product with Australian-based Cynata Therapeutics based on technology originally developed in the lab of Igor Slukvin, MD, PhD, at UW-Madison. The project uses induced pluripotent stem cells (iPSC) as starting material to derive mesenchymal stromal cells (MSC)—multipotent stem cells found in bone marrow — as a potential treatment for respiratory distress in patients with COVID-19 infections.

The COVID-19 projects — just three of 12 WB projects currently underway — are on an accelerated timeline. "Understandably, the devastating effect of the pandemic on families, institutions, and the global community motivates everyone to develop vaccines and therapies as quickly as possible," says Ross.

All projects are on schedule with results from the clinical trials expected in the second quarter of 2021.

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