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OUTLOOK

NEWS FROM THE CENTER ON HUMAN DEVELOPMENT AND DISABILITY AT THE UNIVERSITY OF WASHINGTON HEALTH SCIENCES CENTER

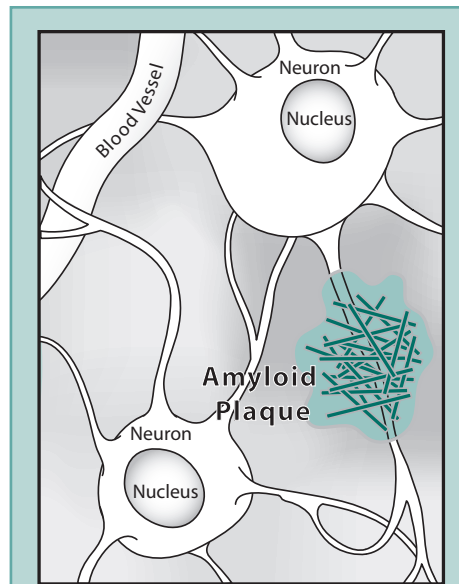
Hunting Proteins to Diagnose Neurological Disorders

Imagine your toddler suffers from seizures. You learn that some children who have seizures at an early age continue to suffer from them through adulthood, while other children seem to grow out of the problem. For reasons that aren't yet understood, their seizures just stop. Your health care team can't provide a prognosis for your child; they, and you, can only wait and see how your child progresses.

But what if a blood test could categorize your child's seizures or other neurological disorders? Such tests could guide treatment as well as help families and medical teams plan for the future. Jing Zhang, M.D., Ph.D., associate professor of pathology and CHDD research affiliate, is laying the groundwork for neurological diagnostic tests by identifying proteins in cerebrospinal fluid (CSF). CSF surrounds the brain and fills the spinal cord. Changes in the type and quantity of certain proteins in CSF can indicate changes in brain activity and health. Zhang and his team are using proteomic techniques to search for such proteins that can serve as effective indicators, or biomarkers, of neurological developmental and disease progression.

"Currently we've identified more than two thousand proteins in CSF," said Zhang. "That's the most extensive characterization of spinal fluid to date. This information serves as a basis for everyone studying neurodegenerative diseases, as well as typical and aberrant development in children."

Zhang's proteomics team includes Ellsworth Alvord, M.D., emeritus professor of pathology and CHDD research affiliate; James Leverenz, M.D., associate professor of neurology and of psychiatry and behavioral sciences and CHDD research affiliate; Elaine Peskind, M.D., professor of psychiatry and behavioral sciences; and Thomas



Amyloid beta forms plaques in the brain that are associated with Alzheimer's disease (AD). Persons with Down syndrome may be more susceptible to AD because they carry three copies of the chromosome that codes for a precursor to amyloid beta. Zhang has detected possible biomarkers for AD that may allow early diagnosis of the disorder.

Montine, M.D., Ph.D., professor of neuropathology and pathology.

Currently Zhang's proteomics team is focusing on finding biomarkers for disorders that affect adults, including Alzheimer's disease (AD), Parkinson's disease (PD), and dementia with Lewy bodies (DLB), the second most frequent cause of dementia after AD. All three disorders are caused by the destruction of neurons; each is linked to damage in different areas of the brain. AD is an especially serious issue for persons with Down syndrome. About 25 percent of persons with Down syndrome contract AD by age forty. "One hundred percent of people with Down syndrome will get AD if they live long enough," said Zhang. Persons

with Down syndrome are susceptible to AD because they have three copies of chromosome 21, which carries the gene for the amyloid precursor protein (APP). One of the potential breakdown products of APP is amyloid beta, the primary component of structures known as plaques found in the brains of persons with AD. Because persons with Down syndrome have an extra copy of the APP gene, they produce more of this protein, increasing the odds that some of the APP will metabolize into amyloid beta and form plaques in the brain.

One of the goals of Zhang's proteomics team is to locate biomarkers that can be used for early diagnosis of AD, as well as other neurodegenerative diseases. Effective biomarkers for diseases such as AD and PD might include substances known to damage the brain, or proteins created by injured or dying brain cells. Because neurodegenerative processes are so complex, multiple biomarkers might be needed for diagnosis of a disorder.

Using protein biomarkers for diagnosis is more precise than examining an individual's genetic makeup. The presence of a genetic variation may only indicate risk for disease while the presence of certain proteins may signal actual disease progression. For example, a mutation of the gene that codes for Apolipoprotein E (ApoE), a lipid-binding protein, has been linked with AD risk in typically developing adults. However, not everyone who inherits this mutation, known as ApoE4, gets the disease, and many people without the mutation suffer from AD.

The search for biomarkers is slow and painstaking because analyzing an individual's proteome (the total proteins in their system) is much more difficult than inventorying their genes. There are only about 30,000

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genes in the human body, but literally millions of proteins. Most genes can code for multiple proteins and these initial proteins can undergo generations of transformation as they interact during metabolic tasks. To make matters more difficult, many potential biomarker proteins are found at tiny concentrations, outnumbered a million or billion to one by more common proteins, such as hemoglobin.

However, advances in proteomic technologies, such as those available through the Proteomics Component of the CHDD Genetics Core, have made the search for novel proteins easier. Using these technologies, “we can profile proteins extensively down into deep proteome and then find those proteins unique to the central nervous system,” said Zhang.

Proteomic technologies sort and identify proteins and protein fragments by their mass and electrical charge. First, liquid chromatography (LC) is used to sort the CSF samples, siphoning off the most abundant proteins and leaving the rare proteins of interest to Zhang and his colleagues. Then the proteins are ionized and shot into a mass spectrometer, which records their mass-to-charge ratios. Researchers use this information to identify proteins in a sample and estimate their relative abundance.

Although Zhang is interested in the development of blood tests, he and his team are searching for neurological biomarkers in CSF because it carries a higher concentration of potential neurological biomarkers than blood. Not only does CSF circulate directly in the area of interest, the brain, but it also has fewer types and lesser quantities of proteins than blood, making analysis easier. Fortunately, biomarkers found in CSF may also occur in the blood stream. The CSF and circulatory systems are linked across the blood-brain barrier, with CSF forming from blood plasma and draining back into the circulatory system, carrying biomarkers with it. Once neurodevelopmental and neurodegenerative biomarkers are identified in CSF, it may be possible to develop blood tests for them. Because his research depends on access to high quality CSF, Zhang says he is fortunate to be able to work with Peskind, who is associate director of the UW Alzheimer’s Disease Research Center, and of the Mental Illness Research, Education, and Clinical Center in the Veterans’ Administration Puget Sound Health Care System. “Elaine has developed one the best CSF banks in the country,” said Zhang.

Through analysis of Peskind’s samples, Zhang and his team have identified some CSF proteins whose abundance is linked to AD, PD, and DLB. Several are apolipoproteins, which related in form and function to ApoE, the compound linked to genetic risk for AD. One of these potential biomarkers, known as ApoAII precursor, is believed to be unique to the central nervous system, said Zhang. ApoAII precursor may be involved in inflammation, the transport of neurotransmitters, and other processes related to neuron health and disease.

Although he focuses on basic research, Zhang looks forward to possible clinical applications of his work. “I’m a neuropathologist. We often get frustrated because by the time we see a patient it’s too late for effective treatment. By the time a diagnosis of AD or PD can be made definitively, a large volume of cells in the critical regions of the brain are already dead,” said Zhang. “With current medications we can protect existing neurons to a degree. But typically the reserve of functional neurons is very, very low. Now if we can backtrack five years, do the diagnosis then, the reserve of neurons is much higher. And, if by treating then you delay the onset of AD or PD symptoms for five or six years, the benefits to patients and the savings in medical bills would be tremendous.” ♦



Jing Zhang

Finding Better Treatments for Emotional and Behavioral Disorders

Individuals with developmental disabilities are much more likely to suffer from emotional, behavioral, or psychiatric disorders than typically developing individuals. Yet there are very few research-based protocols for treating their disorders. Bryan King, M.D., is working to fill this gap, both through studies of the safety and effectiveness of specific medications and of better methods to conduct clinical trials of medications. Both lines of study may ultimately lead to better methods of treatment.

King focuses on the treatment of disruptive behaviors in persons with developmental disabilities, particularly those with a diagnosis of autism spectrum disorder (ASD). The term ASD refers to a group of neurological disorders with common symptoms, such as difficulty communicating and interacting with others and a tendency to engage in repetitive behaviors. Some children with ASD also engage in disruptive behaviors, such as self-injury, which may include biting or head banging. Such behaviors “can cause extraordinary problems for the individuals or for others in their environment,” said King, a professor of psychiatry and behavioral sciences and a CHDD research affiliate.

Currently, King is directing a multi-site study testing the use of medication to ease behavioral disturbances in children with ASD, such as anxiety, repetitive movements or speech, and an insistence on sameness. The study does not focus directly on disruptive behaviors, but it may contribute to treatments for them. For example, some children with ASD may injure themselves if their repetitive behaviors are interrupted. Easing anxiety and the compulsion for repetition among these children may minimize their triggers for self-injury.

King’s team has recruited 149 children with ASD ages 5-17 years for the project. “This is the largest single medication study of children with ASD to date. But it’s all relative; the size of our group is still small compared to what you would see in studies of other conditions,” said King. The study is funded by the National Institutes

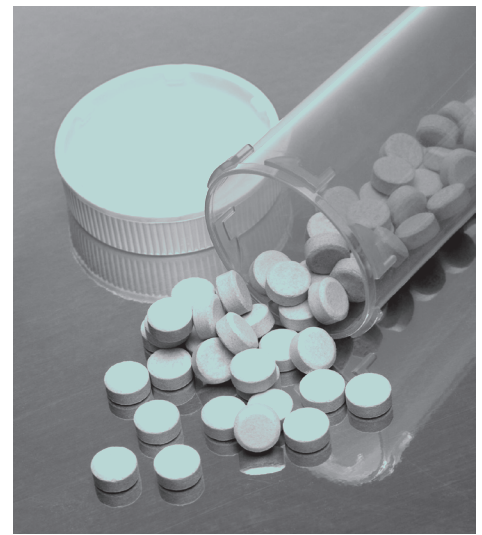
of Health through the Studies to Advance Autism Research and Treatment (STAART) Network.

The study medication is citalopram (brand name Celexa), an SSRI (selective serotonin reuptake inhibitor) used to treat depression, anxiety, and obsessive-compulsive disorder. Results from previous studies indicate that SSRIs may reduce repetitive behaviors and thoughts in some persons with ASD. “One of the advantages of citalopram is that it appears to be more selective than other SSRIs, and it can be administered in a small dose,” said King.

Because ASD is a group of disorders with potentially varied causes and effects, King and his colleagues are focusing on genetic and other factors that may affect response to citalopram. Their results may help clinicians predict who may be most likely to respond to the medication, and to set individualized doses that minimize side effects. Finding effective dosages is especially important in this population because there are indications from clinical practice that some persons with ASD may respond to much lower doses of SSRIs than typically developing persons. Side effects of citalopram can include insomnia, aggression, irritability, and disinhibition, or loss of impulse control.

King is also working to address the ethical and practical challenges of involving persons with developmental disabilities in clinical trials. Many of the same issues face clinicians diagnosing and treating psychiatric disorders in individuals with developmental disabilities. Difficulties in communication can complicate all aspects of research and treatment, especially if the patient has minimal abilities to speak or comprehend language.

The challenges start with diagnosis. For example, the causes of disruptive behaviors, King’s area of specialty, are often complex and difficult to determine. “You might bang your head when you’re frustrated, or bang your head when you have a headache or an ear infection, or bang your head for reasons that are lost on you and everybody else,”



said King. Disruptive behaviors may also be related to the ways a child has learned to function. “It could be that someone starts out with a mood disorder that makes them irritable and very inclined to hit people and they then discover that when they hit people they get lots of attention,” said King.

Once a diagnosis has been reached, communication challenges can also complicate treatment. Persons with developmental disabilities often can’t provide the kind of feedback psychiatrists usually use to determine effectiveness and adjust dosage. “A typically developing adult patient can tell you that he feels lethargic or irritable. But you’re never going to get that kind of feedback from a child with autism or an adult with moderate mental retardation,” said King. Difficulties understanding if a participant is receiving any benefit from a medication or is suffering from unpleasant side effects are especially problematic because persons with developmental disabilities are generally given medications rather than choosing to take them.

Another difficulty is that behaviors targeted for treatment and those used to communicate distress often overlap. For example, a child with



Bryan King

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Improving the Mental Health of Infants in Foster Care

Infants who enter foster care are often at great risk. Before birth, many didn't get adequate nourishment, or were exposed to drugs or alcohol. After birth, their lives are disrupted, perhaps first by neglect or abuse, then by separation from their birth parents and, often, by separation from a series of foster homes. As a result, many children in foster care develop poor mental health. According to one study, persons who had been in foster care suffered from major depression and post-traumatic syndrome at rates nearly double those of combat veterans. In turn, poor mental health is associated with and can contribute to developmental delays or behavior or learning problems.

"Infancy may represent the greatest opportunity in a child's life to prevent adverse mental health outcomes."

- Susan Spieker

Although the first year of life is a time of vulnerability, it is also a time of tremendous potential. Researchers working to maximize this potential include Susan Spieker, Ph.D., and Jean Kelly, Ph.D., both professors of family and child nursing and research affiliates at the Center on Human Development and Disability (CHDD). "Infancy may represent the greatest opportunity in a child's life to prevent adverse mental health outcomes," said Spieker, who also directs the CHDD Behavioral Science Core and the Birth to Three Research Laboratory. Kelly directs the Promoting First Relationships Program and NCAST-AVENW, a dissemination and training program to promote nurturing environments for young children. Spieker and Kelly are also the director and co-director, respectively, of the Center on Infant Mental Health and Development.

Spieker and Kelly are working to improve the mental health of infants in foster care through the support and training of foster parents. One of their current research projects, known in the community as the Fostering Families Project, will involve 236 families from Pierce County in Washington State. The families will be foster, kin, or birth families caring for an infant who has recently had a disruption in a primary relationship as a result of leaving or entering foster care. The Fostering Families Project is a community-based research project, with community representatives providing input on all aspects of the project, including the interventions received by foster children and families. In addition to the state agencies responsible for the care of foster children, Spieker and Kelly are working with five community agencies concerned with the mental health of foster children.

One of the most common mental health problems found among infants in foster care is difficulty in regulating emotions. For example, these children often don't know how to soothe themselves when they become upset. "In a typical family, when children are frightened, distressed, or disturbed by something in their environment, they will cry and approach their caregiver for comfort," said Spieker, "After they've gotten comfort and feel better, they're able to face the world again." However, many infants in foster care had birth parents who were unavailable, unresponsive, or had their own difficulties in regulating emotion. These children learned that their caregivers were not a reliable source of comfort. As a result, they tend to avoid or resist comfort from their foster parents.

"When they're hurt or frightened, a child who avoids comfort may not approach their caregivers. They may not cry. They may look like they're unaffected by a frightening event that would cause another child to cry or run to a parent for help," said Spieker. "And a sensitive caregiver who sees that kind of behavior may think, 'O.K, well, I don't want to intrude, he's doing fine.' But the child is actually frightened. There have been physiological studies to show that even though such children don't show distress, their hearts are beating faster and they're quite stressed." In contrast to the stoic behavior of avoidant children, children who resist comfort may continue fussing regardless of the comfort provided by their caregivers.



Many foster children suffer from poor mental health, which can contribute to developmental delays. CHDD researchers Susan Spieker and Jean Kelly are working to improve the mental health of very young children through programs that train and support foster parents.

These children often appear anxious and needy, and use behaviors such as crying and whining to keep their caregivers engaged, afraid that if they lose their caregivers' attention, they will be too vulnerable in a world that seems unsafe to them.

Both avoidant and resistant children can "lack the tools to develop healthy relationships," said Spieker. One way to help these children is to help foster parents understand the cause of avoidant and resistant behaviors, "to reframe challenging behaviors as a language of distress," said Kelly. Then a caregiver can understand that a child really does need help and comfort, despite behaviors that might indicate otherwise. "If a child knows that you understand what his behavior means and then meet his needs, this increases the child's feelings of trust and security. And if the child feels trusting and secure, he is less likely to try to meet his own needs with these challenging

behaviors,” said Kelly.

The Fostering Families Project will test two interventions. Families in both groups will receive several home visits from social workers or mental health care providers. Children will be recruited between 10 and 20 months of age and will be followed for a year after the intervention ends.

One intervention is based on an early education support model that will provide education and support services to families. “Fifty percent or more of infants in foster care have special needs that qualify them for interventions and services,” said Spieker. “It’s very overwhelming for a new foster parent to find out about all these resources and figure out everything their child needs in a timely manner. This service will be very helpful to foster

“And if the child feels trusting and secure, he is less likely to try to meet his own needs with . . . challenging behaviors.”

- Jean Kelly

parents as they go through this process,” said Spieker. Services provided in this intervention may include developmental assessments, referrals to resources and activities that encourage child development, and strategies to address challenging behaviors in children.

The other intervention is based on the curriculum, Promoting First Relationships, which was developed by Kelly and her colleagues at the University of Washington. Through this program, foster parents receive positive and instructive feedback about their interactions with their foster child, with the goal of building the caregivers’ confidence and competence. Parents also learn to reflect on their young children’s feelings and needs, as well as their own.

The need for programs such as those developed and tested by Spieker and Kelly is growing. The number of infants in foster care has increased dramatically in the last 20 years. Currently, about 20 percent of children entering foster care in Washington State are infants. In addition, infants often move through multiple foster families. In Pierce County, where the Fostering Families Project is based, more than half of infants in foster care are placed in two or more foster families in their first year of life. Repeated changes in foster care placements reflect, and can contribute to, declines in a child’s behaviors and mental health.

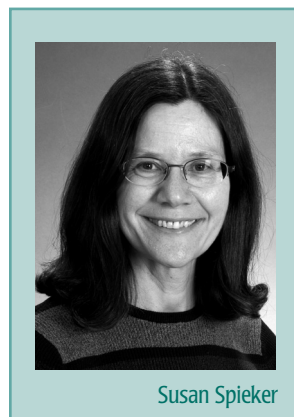
“If children stay on a track of repeated placements, by the time they’re school age they may begin, to use the language of social work, blowing out of placements,” said Spieker. “The worst case scenario is that these children eventually are sent to increasingly restrictive settings, such as group and institutional care, which are expensive and less likely to meet children’s developmental needs. That is the end point we’re trying to avoid by starting early,” said Spieker.

By improving the mental health of infants in foster care, Spieker and Kelly hope to reduce the number of foster placements these children pass through. “We’ve seen resiliency in children in foster care that have been given the opportunity at a very young age to experience a very consistent and sensitive caregiver,” said Kelly.

Two other UW researchers are also principal investigators on the project: Maureen Marcenko, Ph.D., professor of social work; and Monica Oxford, Ph.D., research assistant professor of social work. Project consultants include Mary Dozier, Ph.D., professor of psychology, University of Delaware, and Robert Clyman, M.D., executive director of the Kemp Center for the Prevention and Treatment of Child Abuse and Neglect, Department of Pediatrics, University of Colorado Health Sciences Center. ♦



Jean Kelly



Susan Spieker

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ASD might be given medication if he is irritable, agitated, or aggressive. “But irritation, agitation, and aggression may be my only way of expressing that I feel really rotten,” said King. Therefore, if medication makes a child feel sick, the child may act out. “The response of the health care provider can be: ‘The aggression is not responding to our medicine, let’s give the child a higher dose,’” said King. “There’s the potential to get into a vicious cycle.”

Managing disorders with complex, multiple causes often requires coordinated treatment by health care providers from several specialties. Yet institutional barriers can make this difficult. “There’s often an either/or view regarding divisions of developmental services and divisions of mental health in state systems,” said King. “It’s exemplified here in Washington State with the relatively recent decision to make autism a diagnosis that does not qualify one for receipt of mental health services under Medicaid.”

Medicating children with problem behaviors can be controversial. “People generally recognize that having an intellectual disability doesn’t protect you from mental illness and probably increases your susceptibility, but there is a lot of concern about labeling, discrimination, and stereotyping,” said King. “However, some people are quite willing to accept significant behavioral disturbance as simply part of an intellectual disability and I think that’s just as problematic.”

The complexity of treating persons with developmental disabilities, combined with the great need for services, can be humbling, said King. “The way we identify and treat these disorders is much more complicated than that for the general population, which is by no means easy, either,” he said. “Yet, the potential benefits are huge. Effective treatment can literally make the difference between living in an institution and being able to stay at home with your family.” He adds that working with family members is one of the chief benefits of his research. “The families are just amazing. I get to meet and work with people who are the angels of this world. It’s a real privilege.” ♦



Faculty Members Appointed as New CHDD Research Affiliates



Kristina M. Adams, M.D., assistant professor of obstetrics and gynecology, focuses on the prevention of premature births. Because prenatal inflammation and infection can trigger preterm labor, Adams studies interactions between the immune systems of mothers and of their unborn children. She is especially interested in ways a mother's cells might inappropriately activate her unborn child's immune response, which begins to mature during the third trimester of

pregnancy. A better understanding of these interactions could lead to methods to prevent or treat prenatal inflammation and so reduce the risk of premature birth.



Daniel Drane, Ph.D., assistant professor of neurology, studies the neural underpinnings of semantic memory, especially for naming and recognition. His work may increase understanding of overall language development, as well as the recognition and understanding of deficits in semantic memory among persons with developmental disabilities. Specifically, Drane studies the impact of epilepsy and surgeries to control epilepsy on semantic memory. He also

researches the effects of antiepileptic drugs on children exposed before birth with the goal of determining which of these drugs are safest for use during pregnancy.



Suman Jayadev, M.D., is an acting assistant professor of neurology. Chronic inflammation associated with HIV/AIDS can damage the central nervous system (CNS), even in individuals treated with anti-viral therapies. As a result, as many as half of the children who contract AIDS may develop some degree of cognitive disability. Jayadev studies a class of proteins, presenilins, involved in

inflammatory cascades that can influence neurodegenerative processes injuring brain and nerve cells. These proteins are also critical to prenatal development. Therefore her work may contribute to a better understanding of human development, as well as treatments to reduce CNS inflammation in persons with HIV/AIDS.



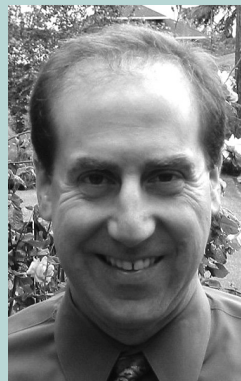
Timothy Cox, Ph.D., is a research associate professor of pediatrics. His team uses molecular genetic, biochemical, cell biological, and embryological techniques to study the molecular and developmental causes of common craniofacial malformations, such as cleft lip/palate and craniosynostosis (the premature fusion of fibrous joints in the skull). These malformations can present as isolated anomalies or as part of an

array of atypical developments often associated with developmental disabilities. Dr. Cox's work is ultimately aimed at developing better strategies to diagnose and manage treatment for atypical craniofacial development.



Clifford Hume, M.D., Ph.D., is an assistant professor of otolaryngology—head and neck surgery. He studies sensory hair cells in the inner ear, specifically molecular signals that regulate the development of these cells and their neuronal connections to the brain. Eventually, biologic therapies involving these signals may be used to trigger the repair or regeneration of damaged or missing hair cells, or to better integrate

cochlear implants into the auditory system. To target delivery of these molecules to the inner ear, Hume is also developing new surgical techniques and gene vectors.



Jonathan Weinstein, M.D., Ph.D., assistant professor of neurology, studies the role of neuro-inflammation in stroke. Pediatric strokes can cause death or neurodevelopmental disabilities in infants and children. Inflammation following a stroke can compound the initial damage. Weinstein focuses on factors that activate microglia, mobile neural support cells that perform immune functions such as killing or ingesting damaged cells. Currently, he

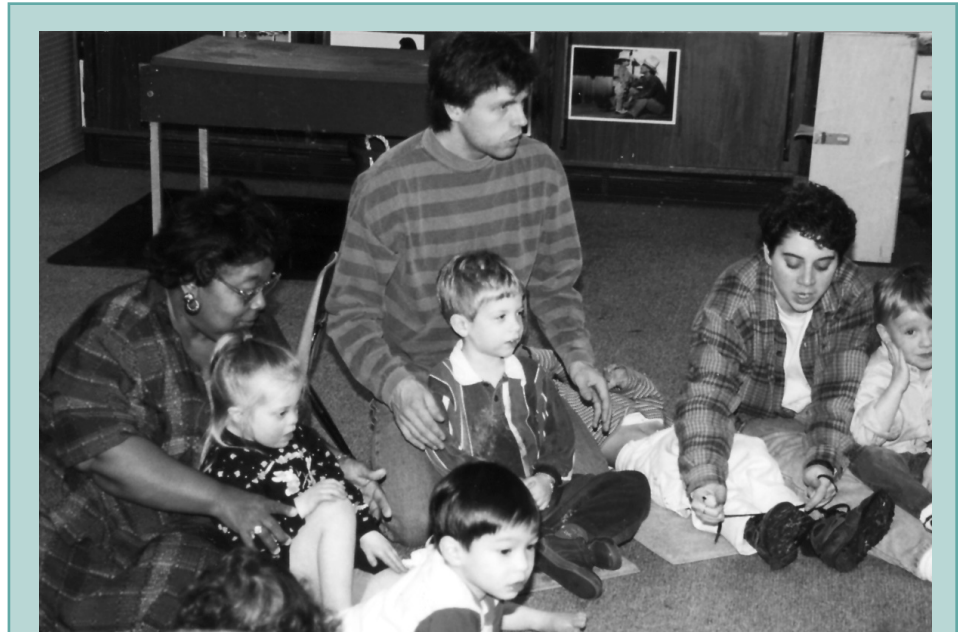
is studying microglial signaling related to thrombin, a protein involved in blood coagulation and neural development.

Head Start Outreach: Training Teachers in Best Practices

Monitoring a pair of active preschoolers can be all consuming. Multiply that challenge by five or ten and you have the hectic world of a Head Start teacher. Between leading songs, distributing snacks, tying shoes, and changing the occasional diaper, Head Start teachers have little time to learn optimal methods for nurturing the development of the children in their classes, especially children with special needs.

The nationwide Head Start program was established to encourage the development of young children from low-income families so that they are better prepared to learn in kindergarten. The program mandates that at least 10 percent of the children in each Head Start program have developmental or other disabilities. Therefore, Head Start teachers need to understand the needs of children with developmental disabilities and learning delays, as well as techniques for leading inclusive activities for children with a wide range of abilities.

To get the training they need, Head Start teachers come to the Experimental Education Unit (EEU) at the Center on Human Development and Disability (CHDD). Intensive, five-day internships sponsored by the Early Childhood Education Total Quality Outreach Project offer Head Start teachers an opportunity to learn and practice teaching methods away from the distractions and demands of their own classrooms. Internships are based at the EEU Infant and Toddler, and Preschool programs, which offer inclusive classes for children with and without disabilities. Since it began in 1996, the internship program has trained more than 120 Head Start coordinators, teachers, and teaching assistants from Washington, Oregon, California, Texas, and New Mexico. The current program, Migrant Head Start Outreach, offers internships to teachers from Migrant and Seasonal Head Start programs located in rural Washington State. Migrant and Seasonal Head Starts serve children of migrant and Hispanic families, a substantial population in Washington where the \$5.3 billion agriculture industry employs about 170,000 workers. Many interns come from Head Starts sponsored



Staff from Migrant Head Start programs learn and practice research-based teaching methods to promote the development of young children, especially those with special needs.

by the Washington State Migrant Council, a non-profit that has funded internship programs and serves as the EEU's primary partner in the Migrant Head Start Outreach program.

The internship program provides training for three staff members each from about five Migrant and Seasonal Head Start sites every year. To be eligible for the internships, staff members must be working toward associate or bachelor's degrees. They earn academic credit for their participation in the internship and follow-up activities.

The internship program emphasizes evidence-based teaching methods, or best practices, developed through research at the CHDD and other institutions, said Joseph Stowitschek, Ph.D., program director and a research professor of education. The interns are asked to select five children from their Head Start classrooms who have special needs, and to focus on best practices that are especially applicable to these children.

Several best practices encourage active engagement, which is crucial to learning. Children who are actively engaged are focused on a given lesson or activity. In contrast, children who are passively engaged may look attentive, but are not fully or consistently focused and, in fact, may be

daydreaming. Inappropriate engagement occurs when children disrupt the class. Children who are not engaged pay no attention whatsoever to the target activity.

Interns may learn a variety of techniques to encourage active engagement. Techniques for large groups, such as the "round rug" activities that typically begin a day at Head Start, include leading children in songs or dances, or reading interactive stories, such as ones that encourage children to call out "turn the page!" or to howl like a coyote. Interns focus on ways to encourage active engagement among children with learning delays or disabilities, such as those with difficulty in comprehending and expressing language. "If you have a child who isn't able to speak complete words or sentences, the teacher can read a pirate story," said Lynora Hirata M.H.D., project coordinator. "The teacher can ask, 'What do the pirates say?' and the kids can say 'Aaarghhh!' or 'har, har, har'."

A key practice to encourage active engagement in individual interactions is to allow children enough time to respond to questions. It can take as long as five seconds for a child with a language disability or delay to comprehend a teacher's question, decide

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on a response, and express it. “Five seconds is forever when you’re in conversation, so we’re really uncomfortable with doing that,” said Stowitschek. “But that five seconds can make a real difference in getting a response from a child.”

During their week at the EEU, interns hear lectures on the best practices they have opted to study, observe the practices in use, and use them while working with EEU students and staff. Interns then work with mentors to plan ways to implement the practices in their home classrooms. “Almost without exception, participants have regarded this collaborative approach as one of the most helpful steps of the internship,” said Stowitschek. “Interns and staff have an unprecedented opportunity to reflect and problem-solve on how they can adapt a particularly innovative or useful technique to a center or classroom.” The interns also commit to train and mentor teachers and assistants at their own and other Head Start sites.

Follow-up support for the teachers once they return to their classroom is extremely important, said Stowitschek. “From our experiences in several outreach projects, we have concluded that there is

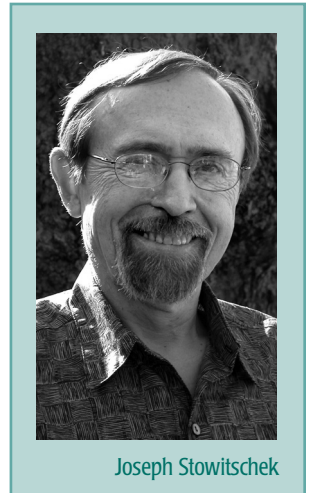
often a small logistical obstacle or missing step in an instructional technique that leads an unsupported teacher to prematurely conclude a sound practice does not work in his or her case.” Ongoing support for the interns includes teleconferences with project staff members and message boards on the program web site, which Stowitschek categorizes as being in the “toddler” stage of development. To encourage use of the message boards, participation is required for interns to receive academic credit for the internship program. Interns must not only post questions on the web site, but also offer advice to other teachers.

One example of successful online support involved a teacher who was having difficulties finding time to train her assistants in several best practices. Suggestions from other teachers included asking a parent to take over an easy-to-lead activity for 15 minutes so the teachers could have a brief meeting. The teacher with training needs reported positive results. “A parent stayed over this Wednesday and took over the big-round-rug time, while I met with staff. I was impressed at how quickly they picked up on the idea and used my tip (to wait 5 seconds after each request, giving the child time to

respond). One teaching assistant was so excited. A child said ‘My coat’ for the first time! Thank you!”

Other staff who have contributed to the Migrant Head Start Outreach

program include Eduardo Armijo, Ph.D., co-principal investigator; Ilene Schwartz, Ph.D., professor of education; and Romie Guillen and Delores Gonzalez, evaluation specialists. The training program is based on best practices published by the Division for Early Childhood, Council for Exceptional Children, and co-edited by Susan Sandall, Ph.D., associate professor of special education and director of the EEU Infant and Toddler Program. More information about the internship program is available online at http://depts.washington.edu/chdd/ucedd/eeu_7/migrantheadstart_7.html. ♦



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