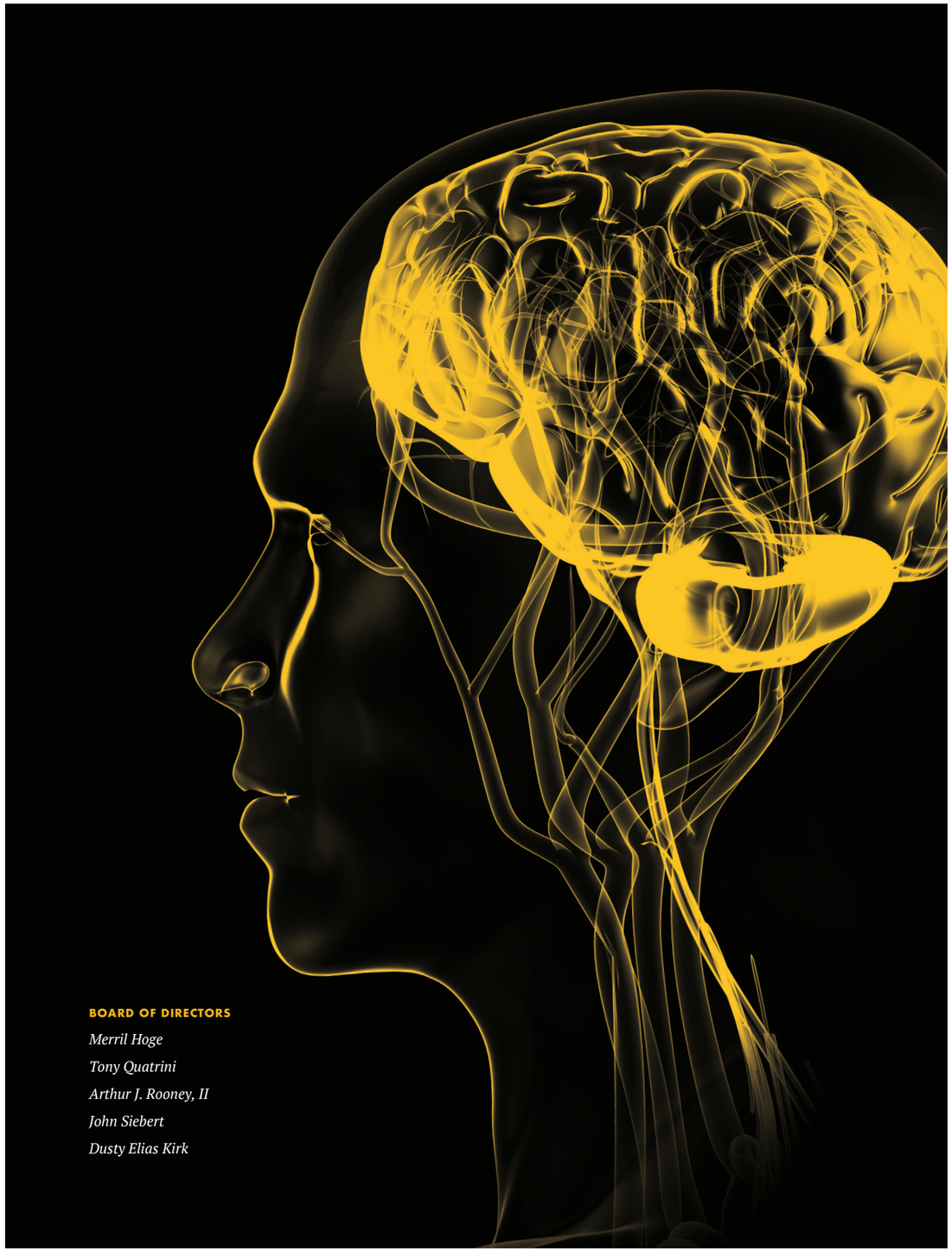
ANNUAL REPORT 2018

Chuck Noll Foundation

FOR BRAIN INJURY RESEARCH



“There has been tremendous progress regarding concussions and brain injury research, but there is still much work to be done and many questions to be answered. The Chuck Noll Foundation proudly supports groundbreaking research by renowned scientists in the field of traumatic brain injury.”

– ARTHUR J. ROONEY, II

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Pushing the Boundaries of Brain Injury Research

Whether mild or traumatic, whether caused on the playing field or the battlefield, brain injury is a serious heath issue that requires our full attention. In December 2016, the Chuck Noll Foundation for Brain Injury Research was founded to help doctors and researchers find the best methods to diagnose, treat and prevent brain injuries.

The Foundation is uniquely positioned to support research into sports-related brain injury for three key reasons. One, thousands of youth, college and professional athletes play on the fields and courts of southwestern Pennsylvania.

Two, Pittsburgh is fortunate to be home to some of the world's most cutting-edge research on brain injuries and sports concussions. The UPMC Center for Sports Medicine treats over 10,000 young athletes each year, more than most other places in the country.

And perhaps most importantly, legendary Steelers coach Chuck Noll's commitment to his players' well-being ultimately led to the development of the ImPACT test (Immediate Post-Concussion Assessment and Cognitive Testing) used by NFL team doctors since 2007, and by most schools across the country.

Now in our second full year of existence, the Foundation has granted over $1 million to research projects at four major academic and medical institutions in southwestern Pennsylvania and West Virginia. Guided by the Foundation's National Science Advisory Committee, these grants support research in basic and clinical science, as well as diagnosis and treatment.

As the Chuck Noll Foundation continues to grow and expand its reach, we hope you will join us in furthering our mission of one day perfecting diagnosis and treatment and preventing brain injuries for those who choose to play amateur or professional sports.

Sincerely,

"Every day we uncover more about how the brain reacts to traumatic injury in the short and long term. We must continue to leverage the latest technology and innovation to more accurately identify and understand brain injury and apply the best treatments and therapy. The support of the Chuck Noll Foundation allows us to continue this critical work."

– **PULKIT GROVER,**
Associate Professor, Electrical & Computer Engineering and Biomedical Engineering, CMU

Arthur J. Rooney, II
CHAIRMAN

John R. Denny, Jr.
EXECUTIVE DIRECTOR

OUR MISSION
Promoting Breakthroughs in Brain Injury Research

The Chuck Noll Foundation for Brain Injury Research awards grants in order to advance research related to the prevention, diagnosis, and treatment of injuries to the brain occurring primarily from sports activities. We share information on best practices and promising research with the community and partner with other foundations, companies, organizations, and individual donors who share our mission.

CHUCK NOLL. A LEGENDARY COACH. A VISIONARY LEADER.

You know Chuck Noll as the Hall of Fame coach who won four Super Bowls. But you may not know his role in creating the first concussion protocol for athletes. In 1990, at a time when little was known about concussions, Noll asked Steelers' neurosurgeon Dr. Joseph Maroon to look into head injuries and their effects.

Noll's commitment to his players' well-being ultimately led to the implementation of the ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing) protocol co-developed by Dr. Joseph Maroon and Dr. Mark Lovell. Today, ImPACT is one of the primary tools for assessing return to play in all contact sports, and is used to evaluate over 22 million athletes in 10 countries.

The Chuck Noll Foundation for Brain Injury Research is proud to honor the memory of a football legend and true innovator for his vital contribution to athlete safety.

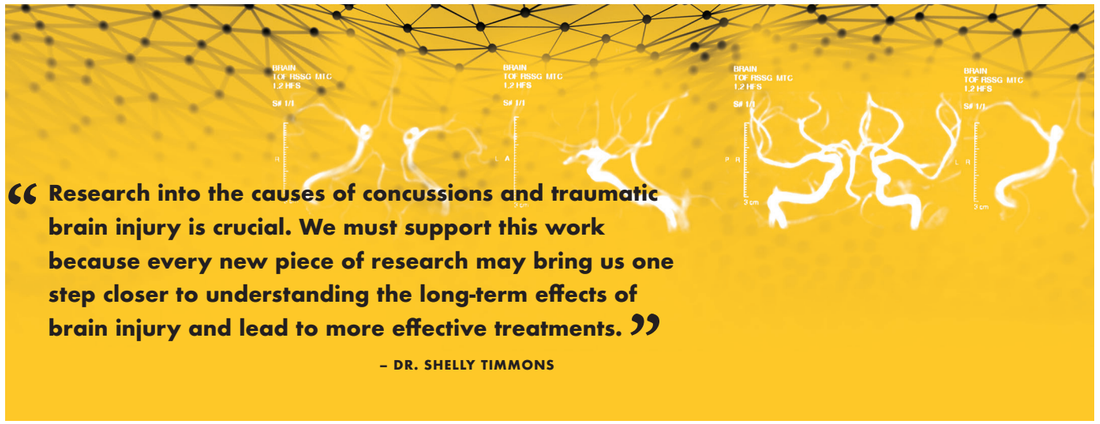
Research Grants Awarded
2017 – 2019

The Pittsburgh region is rich in medical expertise, and home to some of the world's top minds in brain research. In our first two cycles, the Chuck Noll Foundation for Brain Injury Research received an overwhelming number of incredibly impressive research proposals. With the recommendation of the Foundation's National Science Advisory Committee and the approval of the Board of Directors, the Chuck Noll Foundation awarded 9 grants in the areas of prevention, diagnosis and treatment of brain injuries. To date, the Foundation has awarded just over $1.2 million in grants.

Randomized Controlled Trial of a Precision Vestibular Treatment in Adolescent Patients following Sports-Related Concussion

MICHAEL COLLINS, PHD
ANTHONY P. KONTOS, PHD
UPMC

Each year in the U.S., nearly two million children and adolescents suffer sports-related concussions. Most don't receive appropriate clinical care for their injuries, which present a wide range of symptoms. This is a one-year randomized controlled study of a specific treatment to determine the effectiveness of precision vestibular treatment compared to standard care for reducing recovery time, symptoms, and cognitive impairment in adolescent patients with specific symptoms.



"Research into the causes of concussions and traumatic brain injury is crucial. We must support this work because every new piece of research may bring us one step closer to understanding the long-term effects of brain injury and lead to more effective treatments."

– DR. SHELLY TIMMONS

Biomarker Panel for Inflammation and Tau in Concussed Athletes

AVA PUCCIO, RN, PHD
JESSICA M. GILL, RN, PHD
UNIVERSITY OF PITTSBURGH
AND NATIONAL INSTITUTES OF HEALTH

There is growing interest in determining not only when it's safe for concussion patients to return to play, but also creating objective measures to monitor a tipping point of repeated damage. Sweat can be measured to provide an objective, non-invasive biomarker. The goal of this study is to generate a temporal timeline of biological pathways implicated in concussion, using novel sweat patch analyses and correlation to objective symptomology.

Novel Systems for Concussion Monitoring and Treatment Automated Detection and Suppression of Brain Tsunamis for Alleviating Brain Damage from Concussive Injuries

DR. PULKIT GROVER
CARNEGIE MELLON UNIVERSITY

In concussion patients, the presence of Cortical Spreading Depolarizations (CSDs), also known as brain tsunamis, is an indicator of worsening brain injury. It is believed that waves of CSDs spread slowly and undetectably on the brain surface following a concussion, causing further injuries with no obvious symptoms. This study will bring scientific leaders in engineering and neuroscience together with clinicians in brain injury to develop automated, noninvasive monitoring and concussion treatments to non-invasively detect and suppress waves of CSDs.

Decosahexaenoid Acid and Presynaptic Mechanisms in Mild Traumatic Brain Injury

DR. C. EDWARD DIXON
AND DR. SHAUN CARLSON
UNIVERSITY OF PITTSBURGH

A three-year study to use one of the brain's fatty acids to improve the functioning of neurons damaged by multiple mild traumatic brain injuries.

Use of Brain Diffusion MRI Connectometry to Quantitate Connectome Changes

DR. JUAN FERNANDEZ-MIRANDA
AND DR. FANG-CHENG (FRANK) YEH
UPMC

A one-year study to assess changes in the brains of retired contact-sport athletes with post traumatic disorders.

Sulfonylurea Receptor-1 and Glyburide: Preventing Brain Swelling and Providing Neuroprotection in Mild Repetitive Traumatic Brain Injury

RUCHIRA M. JHA, MD
PATRICK M. KOCHANEK, MD
UNIVERSITY OF PITTSBURGH

Using a pre-clinical approach to develop new understanding and therapy for the devastating second impact syndrome reported in high school and college athletes.

Levetiracetam as a Therapy for Synaptic Dysfunction After Repetitive Mild Traumatic Brain Injury

SHAUN CARLSON, PH.D.
UNIVERSITY OF PITTSBURGH

Examining the effect of levetiracetam treatment on neurotransmission deficits and cognitive dysfunction after experimental repetitive mild traumatic brain injury.

Fundamental and Applied Concussion Recovery Modality Research and Development: Applications for Enhanced Recovery and Neuroprotection

JOSHUA HAGEN, PHD
WEST VIRGINIA UNIVERSITY

Understanding the fundamental mechanisms of recovery from concussion and the impact of forward thinking recovery modalities.

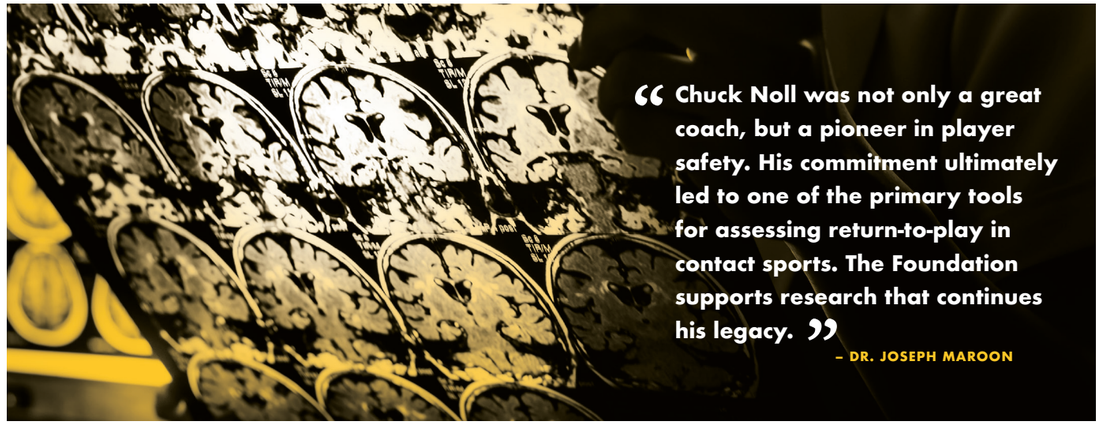
Toward the Identification of Saliva Biomarkers Predicting the Clinical Course and Outcome of Adolescents with Mild Traumatic Brain Injury

AMEILA VERSACE, MD
UNIVERSITY OF PITTSBURGH

To examine the extent to which levels of saliva microRNAs in the early phase of injury can predict the severity of short-and long-term symptomatology.

Meet our National Science Advisory Committee

One of the Foundation's strengths is its National Science Advisory Committee. The NSAC comprises leading neurosurgeons and scientists across the U.S. The NSAC reviews, interviews and recommends research proposals seeking support from the Chuck Noll Foundation. The NSAC provides the Foundation with critical information on recent developments and trends in brain injury research.



Dr. Julian E. Bailes, MD

CHAIRMAN OF THE DEPARTMENT OF NEUROSURGERY AND CO-DIRECTOR OF THE NORTHSHORE NEUROLOGICAL INSTITUTE

An expert in neurovascular disease, Dr. Bailes is a recognized leader in neurosurgery and the impact of brain injury on brain function. He has been instrumental in the understanding of the clinical evidence of chronic traumatic encephalopathy (CTE). His research is focused on mechanisms and treatment of cerebral concussions.

Dr. Bailes is a founding member and director of the Brain Injury Research Institute, which studies traumatic brain injuries and their prevention. He served 11 years as professor and chairman of the department of neurosurgery at West Virginia University School of Medicine, specializing in the diagnosis and surgical treatment of cerebrovascular disease, stroke, and traumatic brain injury.

Dr. Bailes has been honored as one of the nation's best surgeons for eight consecutive years in U.S. News & World Report's "America's Best Doctors" and "America's Top Surgeons."

Regis W. Haid, Jr., M.D.

FOUNDING PARTNER OF ATLANTA SPINAL CARE AND MEDICAL DIRECTOR OF ATLANTA'S PIEDMONT SPINE CENTER AND NEUROSCIENCE SERVICE LINE

A renowned surgeon and educator, Dr. Haid has been visiting professor at 30 universities around the word, taught over 190 spinal courses, presented over 500 papers, and contributed more than 135 scientific articles to peer-reviewed journals. His research includes spinal reconstruction techniques.

He has been named Richard C. Schneider Lecturer for the American Association of Neurological Surgeons; Charles Drake Lecturer for the University of Virginia; and Canadian Neurosurgical Society (CNSS) Penfield Lecturer for the Canadian Congress of Neurological Sciences. Dr. Haid has been named one of the "Best Doctors of America" since 1994, and is listed by Consumers Research of America as a Top Surgeon.

Dr. Joseph C. Maroon

PROFESSOR AND VICE CHAIRMAN, HEINDL SCHOLAR IN NEUROSCIENCE DEPARTMENT OF NEUROLOGICAL SURGERY UNIVERSITY OF PITTSBURGH MEDICAL CENTER

Dr. Maroon has been Pittsburgh Steelers' team neurosurgeon for 30 years. In 1990, he co-developed, along with Dr. Mark Lovell, the only FDA-approved test for concussion assessment, which remains the standard of care in most amateur and professional sports organizations.

Dr. Maroon serves on the board of directors of Mylan Laboratories and chairs their science and technology committee. He is chairman of the scientific advisory board to General Nutrition Corporation, chairman of the medical and scientific advisory board of Stemedica, a pioneering company in the therapeutic use of stem cells, and senior vice president of the American Academy of Anti-Aging Medicine (A4M), one of the world's largest medical societies for preventive medicine. He has published over 270 peer review papers and five books.

Shelly D. Timmons, MD, PhD, FACS, FAANS

PROFESSOR OF NEUROSURGERY AT PENN STATE UNIVERSITY MILTON S. HERSHEY MEDICAL CENTER

Dr. Timmons practices neurosurgery and neurocritical care at PSU, where she is vice chair for administration for the department of neurosurgery and director of neurotrauma.

Among her professional positions is president of the American Association of Neurological Surgeons. She has been chair of the Washington Committee of the American Association of Neurological Surgeons (AANS) and Congress of Neurological Surgeons (CNS), chair of the Neurosurgery Advisory Council of the American College of Surgeons, and chair of the Joint Section on Neurotrauma and Critical Care of the AANS and CNS. She is president of the Pennsylvania Neurosurgical Society.

She has been principal investigator in many clinical trials related to traumatic brain injury. She has published and lectured on traumatic brain injury (TBI), neurocritical care, spinal cord injury, blunt vascular injury, and health care delivery. Her primary research interests include clinical trials in TBI, multi-modality monitoring in neurocritical care, prognostication in TBI, diagnosis and treatment of blunt vascular injury, effects of antithrombotic medications on TBI outcomes, and optimal organization of healthcare delivery for brain-injured patients.

Grants and Sponsorships BY THE NUMBERS

Total Grant Commitments,
2017-18 and 2018-19 cycles **$1,287,836**

Clinical Research **$992,400**

Basic Science ... **$300,000**

Total Grant Payouts, 2018 - 2019 ..... **$740,418**

Sponsorships **$20,000**

Chuck Noll Foundation for Brain Injury Research Lecture Series with the American Association of Neurosurgeons/Congress of Neurosurgeons **$15,000**

Annual Conference of the National Neurotrauma Society **$5,000**

“My son and daughter both suffered sports-related concussions, so my interest in the Chuck Noll Foundation is personal. I support the research that the Foundation funds so parents can know the facts about brain injury based on the best science.”

– DUSTY ELIAS KIRK
Member of the Board

Introducing the Chuck Noll Lecture Series on Sports-Related Trauma

This year, the Foundation launched the Chuck Noll Foundation Lecture Series on Sports Related Trauma. The first lecture was hosted by the American Association of Neurosurgeons (AANS) and the Congress of Neurosurgeons (CNS), two of the country’s most highly respected medical associations, representing thousands of neurosurgeons worldwide. The lecture was held during this year’s AANS/CNS Joint Section on Neurotrauma and Critical Care in San Diego, featuring Dr. Maroon as the inaugural speaker with his presentation, “Concussion and CTE—Personal Reflection and Perspective.”

The AANS and the CNS are dedicated to advancing the specialty of neurosurgery and providing the highest quality of patient care.

This new sponsorship was initiated by Dr. Julian Bailes and Dr. Joseph Maroon, members of the Chuck Noll Foundation’s National Science Advisory Committee. Dr. Bailes is also chairperson of the AANS/CNS Joint Section on Neurotrauma and Critical Care, which will host the new Chuck Noll Foundation lecture series.

Chuck Noll Foundation

FOR BRAIN INJURY RESEARCH

If you would like to make a contribution to the Chuck Noll foundation for Brain Injury Research, checks can be made payable to "The Chuck Noll Foundation for Brain Injury Research" Attn: John Denny, 3400 South Water Street Pittsburgh, PA 15203