Nathalie Sumien, PhD
Institute for Healthy Aging
Pharmacology & Neuroscience
School of Biomedical Sciences
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Area of Expertise

My scientific interests are focused on identifying interventions improving motor and cognitive function during aging and disease state. Our focus has been on the interaction between antioxidant supplementation and exercise, and whether combining the two anti-aging interventions would further their benefit on brain function declines associated with aging and Alzheimer's disease.
My laboratory also works on other interventions for other conditions: sigma 1 compounds and chemobrain (brain dysfunction associated with chemotherapy), hyperbaric oxygen therapy to alleviate the symptoms of Alzheimer's disease, and new antiaging therapy manipulating internal acidity. Identifying successful interventions and their interaction with factors such as genes and gender will lead to specialized recommendations to patients. Furthermore, it will allow us to determine specific mechanisms involved in positive outcomes leading to the development of therapeutic methods to ultimately improve health span of individuals.
Another project of the laboratory is to study the interaction of stroke and/or aging with drugs of abuse and to determine whether drug use makes individuals more susceptible to stroke and development of accelerated aging.

Qualifications

PhD in Biochemistry, Southern Methodist University

BS in Physiology, University of Mont Saint Aigna

Recent Publications

The potential of hyperbaric oxygen as a therapy for neurodegenerative diseases
Mensah-Kane, P. & Sumien, N., Apr 2023, In: GeroScience. 45, 2, p. 747-756 10 p.

Clinical evaluation of fall risk in older adults who use lower-limb prostheses: A scoping review
Finco, M. G., Sumien, N. & Moudy, S. C., Mar 2023, In: Journal of the American Geriatrics Society. 71, 3, p. 959-967 9 p.

Comparison of locomotor stimulant and drug discrimination effects of four synthetic cathinones to commonly abused psychostimulants
Shetty, R. A., Hoch, A. C., Sumien, N., Forster, M. J. & Gatch, M. B., 2023, (Accepted/In press) In: Journal of Psychopharmacology.

Dietary genistein and 17β-estradiol implants differentially influence locomotor and cognitive functions following transient focal ischemia in middle-aged ovariectomized rats at different lengths of estrogen deprivation
Oppong-Gyebi, A., Metzger, D., Vann, P. H., Sumien, N. & Schreihofer, D. A., Aug 2022, In: Hormones and Behavior. 144 , 105201.

Sex differences in neurobehavioral consequences of methamphetamine exposure in adult mice
Davis, D. L., Metzger, D. B., Vann, P. H., Wong, J. M., Subasinghe, K. H., Garlotte, I. K., Phillips, N. R., Shetty, R. A., Forster, M. J. & Sumien, N., Jul 2022, In: Psychopharmacology. 239, 7, p. 2331-2349 19 p.

Long-term hypogonadism diminishes the neuroprotective effects of dietary genistein in young adult ovariectomized rats after transient focal ischemia
Oppong-Gyebi, A., Metzger, D., Doan, T., Han, J., Vann, P. H., Yockey, R. A., Sumien, N. & Schreihofer, D. A., Feb 2022, In: Journal of Neuroscience Research. 100, 2, p. 598-619 22 p.

Novel pharmacotherapy: NNI-362, an allosteric p70S6 kinase stimulator, reverses cognitive and neural regenerative deficits in models of aging and disease
Sumien, N., Wells, M. S., Sidhu, A., Wong, J. M., Forster, M. J., Zheng, Q. X. & Kelleher-Andersson, J. A., Dec 2021, In: Stem Cell Research and Therapy. 12, 1, 59.

Neurodegenerative Disease: Roles for Sex, Hormones, and Oxidative Stress
Sumien, N., Cunningham, J. T., Davis, D. L., Engelland, R., Fadeyibi, O., Farmer, G. E., Mabry, S., Mensah-Kane, P., Trinh, O. T. P., Vann, P. H., Wilson, E. N. & Cunningham, R. L., 1 Nov 2021, In: Endocrinology (United States). 162, 11, bqab185.

Behavioral effects of four novel synthetic cathinone analogs in rodents
Gatch, M. B., Shetty, R. A., Sumien, N. & Forster, M. J., Jul 2021, In: Addiction Biology. 26, 4, e12987.

Evaluation of substituted n-phenylpiperazine analogs as D3 vs. D2 dopamine receptor subtype selective ligands
Lee, B., Taylor, M., Griffin, S. A., McInnis, T., Sumien, N., Mach, R. H. & Luedtke, R. R., 1 Jun 2021, In: Molecules. 26, 11 , 3182.

Sponsored Projects

Acid-Sensing Ion Channels as Molecular Targets in the Improvement of Age-Related Cognitive Dysfunction
Sumien, N.
Intramural Research(UNTHSC)
15/10/14 → 14/04/16

AMPK and Cerebellar Aging
Yang, S. & Sumien, N.
William & Ella Owens Med Research Foun
1/12/16 → 31/12/18

Anti-Angiogenic Effect of Curcumin on Obesity-Related Inflammation and Oxidative Stress in Middle-Aged C57BL/6 Mice
Filipetto, F., Franks, S., Forster, M. & Sumien, N.
Intramural Research(UNTHSC)
15/01/12 → 14/01/13

Brain Stem Mechanisms for Altered Autonomic Regulation of Blood Pressure in Obesity
Schreihofer, A., Sumien, N. & Schreihofer, D.
NHLBI: Nat Heart, Lung & Blood Institute
1/07/17 → 31/08/21

Cocaine-induced Stroke Susceptibility: Brain Function and Metabolism Signaling Pathways
Sumien, N., Forster, M. & Yang, S.
Intramural Research(UNTHSC)
1/05/16 → 31/08/18

Dietary Targeting of Dihydrolipoamide Dehydrogenase for Stroke Tolerance
Forster, M., Huang, R. & Sumien, N.
NINDS: Neurological Disorders & Stroke
1/04/13 → 31/03/18

Effect of Novel Compound on Auditory Function and on Biochemical Markers in Aged Mice
Sumien, N.
Neuronascent, Inc.
1/06/19 → 30/06/20

Effect of Novel Compound on Neurogenesis in Aged Mice
Sumien, N.
Neuronascent, Inc.
1/06/13 → 30/06/14

Effects of Aging on Blood Vessels in the Cerebellar Vermis
Jin, K., Forster, M. & Sumien, N.
NIA: National Institute on Aging
1/04/19 → 31/01/21

Effects of antioxidants and exercise on protein oxidation (For: Saad Jafri)
Sumien, N.
Intramural Research(UNTHSC)
5/06/17 → 31/05/18

Exercise Antioxidants and APOE Interactions in Cognitively Impaired Mice
Sumien, N.
National Alzheimer's Association
1/10/10 → 30/09/12

Exercise, Antioxidants and APOE Interactions in Cognitively-Impaired Mice (For: Kiran Chaudhari)
Sumien, N.
Intramural Research(UNTHSC)
1/09/13 → 31/08/14

Identify the Molecular Targets Involved in Cognitive Improvement of Aged Mice Supplemented with Ammonium Chloride
Sumien, N.
Intramural Research(UNTHSC)
1/09/14 → 31/12/15

Improving Cognitive Impairments: Role of Acid Sensing Ion Channels
Sumien, N.
William & Ella Owens Med Research Foun
5/01/15 → 30/06/17

Improving Impaired Cognitive Function with Novel Neurogenic Agent, NNI-362: A Dose Response Study
Sumien, N.
Classified
1/06/12 → 30/06/13

Interactions between Testosterone and Oxidative Stress in Dopamine Neurons
Cunningham, R. & Sumien, N.
NINDS: Neurological Disorders & Stroke
1/07/15 → 30/06/20

Interactive Effect of Exercise and Antioxidants on Age-Related Functional Declines
Sumien, N.
Intramural Research(UNTHSC)
1/10/13 → 31/08/15

Mechanisms of Cognitive Decline During Aging - Core B
Sumien, N. & Forster, M.
NIA: National Institute on Aging
1/03/13 → 29/02/16

Mechanisms of Cognitive Decline During Aging - Project 1
Forster, M., Sumien, N. & Yan, L.
NIA: National Institute on Aging
1/03/13 → 29/02/16

Metformin and Cognition
Liu, R., Huang, R., Yang, S. & Sumien, N.
Intramural Research(UNTHSC)
1/05/16 → 31/08/17

Neuronal Survival, HIV-1 and Astrocyte-TIMP-1
Ghorpade, A. & Sumien, N.
NINDS: Neurological Disorders & Stroke
15/05/14 → 30/04/19

Neuroprotection of Nonfeminizing Estrogens Against Cognitive Deficits of Alzheimer's Disease
Huang, R. & Sumien, N.
Texas A&M Health Science Center
1/10/15 → 31/03/18

Novel Mechanistic Targets of Steroid Hormones in the Brain - Core B
Forster, M., Shetty, R., Yang, S., Liu, R. & Sumien, N.
NIA: National Institute on Aging
1/12/12 → 30/11/18

Pilot Study on the Risks of Testosterone Replacement to the Brain
Schreihofer, D., Sumien, N. & Cunningham, R.
NIA: National Institute on Aging
15/08/15 → 31/05/18

Post Stroke Cognitive Impairment: Mechanism and Therapy
Yang, S., Liu, R., Sumien, N. & Jin, K.
NINDS: Neurological Disorders & Stroke
1/02/19 → 31/01/24

Predoctoral Training in the Neurobiology of Aging
Forster, M., Sumien, N., Singh, M., SIMPKINS, J., SINGH, M., FORSTER, M., SUMIEN, N., Simpkins, J. W., FORSTER, M. & SUMIEN, N.
National Institute on Aging
1/05/02 → 30/04/22

Sigma 1 Receptor as a Target for Repetitive Concussive Brain Injury
Schreihofer, D., Luedtke, R. & Sumien, N.
Intramural Research(UNTHSC)
1/08/16 → 30/04/18

Training in the Neurobiology of Aging and Alzheimer's Disease
Sumien, N. & Forster, M.
NIA: National Institute on Aging
1/05/19 → 30/04/24

Training in the Neurobiology of Aging and Alzheimer's Disease
Sumien, N. & Forster, M.
NIA: National Institute on Aging
1/05/19 → 30/04/24

Training in the Neurobiology of Aging and Alzheimer's Disease
FORSTER, M., SINGH, M., SUMIEN, N., Sumien, N., Forster, M. & Singh, M.
National Institute on Aging
1/05/02 → 30/04/23

Using rodent behavioral models to identify substance abuse pharmacotherapies
Forster, M., Gatch, M., Sumien, N. & Shetty, R.
NIDA: National Institute on Drug Abuse
20/09/18 → 3/01/23