

The Future of Neurology Now

Next Generation Neurological Treatment, Integration and Prevention

Times: Saturday 8 am - 6:45 pm, Sunday 8:00 am – 3:20pm

Instructor(s): Dr. Trevor Berry, DC, DACNB & Dr. Brandon Brock, DNP, DC, APRN, NP-C, DACNB, DCBCN, BCIM

Total CE hours: 15

Abstract Summary: The purpose of this lecture is to understand how cellular receptors and various treatment techniques alter neurological function. The concept of diagnosis, management and treatment along with documentation and outcome assessment with proven techniques is imperative in this lecture. Looking at genetic responses, antibody testing and basic serological testing is good for diagnostic parameters.

Treatment factors such LLLT, nutrition, receptor-based therapy and joint mobilization are supportive to establish function as it pertains to correction of the physiology noted as pathological on diagnostic testing. The underlying meaning of this concept is involved in conditions that range from aging to many varieties of dementia and encephalopathies as well as an aging brain and nervous system.

Main Objectives:

- Cellular physiology of neuronal excitotoxicity, immunology of brain function and nutritional, laser and rehabilitative concepts.
- Alterations in brain plasticity in mental and neurodegenerative disorders, genetic factors and antibody relationships.
- Comorbidities related to Brain function including hormones, gut function, inflammation, infectious disease, heavy metal issues, lipids, vascular function and receptor-based input.
- Simple linear models of testing, detecting and optimizing brain health with a novel and newly developed combination of photobiomodulation, biomechanical correction, brain-based exercises, nutrition and related labs and posture studies. This is a complete package with backed research and flowing treatment methodology.
- Be able to teach, chart, document and educate your patients while billing and scheduling appropriately.
- Review of medical necessity parameters for each study.
- Review of clinical findings to support the need and type of study.
- To provide case studies and clinical practice scenarios to promote proficiency pertaining to laboratory analysis.

Take Away Concepts: (The learner will be able to)

- ✓ Recognizing diagnostics that can immediately be used.
- ✓ Understanding treatment paradigms that can be used immediately.
- ✓ Understand outcomes assessments that demonstrate the efficacy and quality improvement of therapy that is performed based upon diagnostic direction.

Key Words: (Critical components and Concepts)

- ✓ Immunoexcitotoxicity, Plasticity, Oxidative stress, Hemisphericity, Neurodegenerative disease, Photobiomodulation, Alleles, SNPs, Antibodies, Photons, Various lab markers.

Targeted Clinicians:

This program is designed for the following provider types: (Those with state licensure and or practice and utilization parameters of the material taught as defined within their individual scope of practice).

- ✓ Doctors of Chiropractic
- ✓ Medical Doctors
- ✓ Doctors of Osteopathy
- ✓ Naturopaths
- ✓ Nurse Practitioners
- ✓ Physician Assistants
- ✓ Registered Dieticians
- ✓ Clinical Nutritionists
- ✓ Acupuncturists
- ✓ Oriental Medicine Providers
- ✓ Certified Health Coaches

Instructional Methods:

- On stage presentation
- Video recording
- Power point usage
- Dry erase board usage
- Hands on demonstrations
- Q and A sessions
- Case Studies
- Notes available
- Post session testing for credit as set forth by the standards needed per hour.

Summary:

The information in this lecture is designed to connect the practitioner to real life topics with material and concepts that are rapidly evolving. Many components of this lecture can be coupled with overall health and wellness which is supported by appropriate laboratory testing for the aforementioned topics. Students will have notes and references to utilize as a study tool along with cases and access to instructions during session times.

Program Outline:**Saturday**

7:30-8:00 Registration: Meet and greet and find your seat

8:00-9:45am Dr. Berry

- Weekend outline summary (Flow of material)
- Basic neurophysiology. Understanding the mechanism of healthy neuronal function and the foundation for neuroplasticity.
- Neuropathophysiology. Understanding the mechanisms of neuronal disruption and cell death.
- How lasers influence the common causes of neuronal injury and degeneration.
- How low-level lasers can influence the nervous system.
- Introduction to the Brain gut axis

9:45-10:00am Break

10:00-11:15am Dr. Brock

- Basic genes involved in neurological disorders
- Basic antibody categories involved in neurological disorders
- Introduction to Mast cells and Inflammation (With genetics, antibodies and MHC switching)
- Introduction to glial priming, phenotypical and genotypical alterations (MHC I and MHC II)

11:15-11:30am Break

11:30-12:30pm Dr. Berry (Ethics)

- Lab testing using objective biomarkers for assessment of barrier system (When to test: Ethics Section)
- Using Chiropractic, nutrition and Laser techniques for facilitating recovery of damaged barrier systems, inflammation reduction and glial priming

12:30-1:30pm Lunch

1:30-3:00pm Dr. Brock (Documentation section)

- Pulling together genetic and antibody markers
- Incorporating metabolic function into genetic and metabolic markers
- Reading labs and documenting findings

3:00-3:10pm Break

3:10-5:10pm

Dr. Berry

- Chiropractic Technique
- Condition specific technique and applications for the most common neurological and chiropractic conditions
- Pain syndromes
- Case studies over material.

5:10-5:15pm

Break

5:15-6:45pm

Dr. Brock

- Specific nutritional and neurological applications for the most common neurological and conditions.
- Demonstration on how the spine and other neuro-musculoskeletal conditions manifest with Tx.
- Case study

Sunday

8:00-10:00am

Dr. Brock

- Thyroid genetics, antibodies, labs and brain function
- Androgen genetics, antibodies, labs and brain function
- Blood sugar, Leptins, adiponectins genetics, antibodies, labs and brain function

10:00-10:15am

Break

10:15-12:15pm

Dr. Berry (Two-hour documentation and ethics portion)

- Documentation and ethics
- Supporting medical necessity with FDA cleared research
- Condition specific applications of LLLT and Nutrition protocols
- Hands-on Laser demonstration

12:15-1:15pm

Lunch

1:15-2:30pm

Dr. Berry (Research)

- Summary review of research, physiology, clinical applications, technique.
- Case studies

2:30-2:35pm

Break

2:35-3:20pm

Dr. Brock

- Case study Summary
- **10 minutes: Q and A (Dr. Brock and Dr. Berry)**

References:

1. Adeli, K., Higgins, V., Nieuwesteeg, M., Raizman, J. E., Chen, Y., Wong, S. L., & Blais, D. (2015). Biochemical Marker Reference Values across Pediatric, Adult, and Geriatric Ages: Establishment of Robust Pediatric and Adult Reference Intervals on the Basis of the Canadian Health Measures Survey. *Clinical Chemistry*, 61(8), 1049-1062. doi:10.1373/clinchem.2015.240515
2. Brian, M. J., & Pickering, L. K. (1992). Stool Cultures In Acute Gastroenteritis. *The Pediatric Infectious Disease Journal*, 11(6), 506. doi:10.1097/00006454-199206000-00025
3. Carlberg, C. (2012). The need for education in personalized medicine. *Personalized Medicine*, 9(2), 147-150. doi:10.2217/pme.11.96
4. Cooper, B. T. (1985). Small Intestinal Permeability as an Indicator of Jejunal Mucosal Recovery in Patients with Celiac Sprue on a Gluten-Free Diet. *Journal of Clinical Gastroenterology*, 7(3), 232-236. doi:10.1097/00004836-198506000-00009
5. Duerksen, D. R., Wilhelm-Boyles, C., Veitch, R., Kryszak, D., & Parry, D. M. (2009). A Comparison of Antibody Testing, Permeability Testing, and Zonulin Levels with Small-Bowel Biopsy in Celiac Disease Patients on a Gluten-Free Diet. *Digestive Diseases and Sciences*, 55(4), 1026-1031. doi:10.1007/s10620-009-0813-5
6. Elamreen, F. H., Abed, A. A., & Sharif, F. A. (2007). Detection and identification of bacterial enteropathogens by polymerase chain reaction and conventional techniques in childhood acute gastroenteritis in Gaza, Palestine. *International Journal of Infectious Diseases*, 11(6), 501-507. doi:10.1016/j.ijid.2007.01.010
7. Fueyo-Díaz, R., Gascón-Santos, S., & Magallón-Botaya, R. (2017). I Can't Eat That! Sticking to a Gluten-Free Diet. *Celiac Disease and Non-Celiac Gluten Sensitivity*. doi:10.5772/67462
8. Genomic analysis in personalized diagnostics. (2017). *Clinical Chemistry and Laboratory Medicine (CCLM)*, 55(S2). doi:10.1515/cclm-2017-7011
9. Iron Deficiency Anemia (IDA): A Review. (2016). *International Journal of Science and Research (IJSR)*, 5(4), 1999-2003. doi:10.21275/v5i4.nov163083
10. Salehpour, Farzad, et al. "Transcranial low-Level laser therapy improves brain mitochondrial function and cognitive impairment in D-Galactose induced aging mice." *Neurobiology of Aging*, vol. 58, 2017, pp. 140–150., doi:10.1016/j.neurobiolaging.2017.06.025.
11. Rojas, Julio C., and F. Gonzalez-Lima. "Neurological and psychological applications of transcranial lasers and LEDs." *Biochemical Pharmacology*, vol. 86, no. 4, 2013, pp. 447–457., doi:10.1016/j.bcp.2013.06.012.
12. Gonzalez-Lima, F., et al. "Mitochondrial respiration as a target for neuroprotection and cognitive enhancement." *Biochemical Pharmacology*, vol. 88, no. 4, 2014, pp. 584–593., doi:10.1016/j.bcp.2013.11.010.
13. Chen, Jian-Jiao, et al. "Potential Roles of Exosomal MicroRNAs as Diagnostic Biomarkers and Therapeutic Application in Alzheimer's Disease." *Neural Plasticity*, vol. 2017, 2017, pp. 1–12., doi:10.1155/2017/7027380
14. Lahner, D., and G. Fritsch. "Pathophysiologie intrakranieller Verletzungen." *Der Unfallchirurg*, 2017, doi:10.1007/s00113-017-0388-0.
15. Puentes, Fabiola, et al. "Neurofilament light as an immune target for pathogenic antibodies." *Immunology*, Nov. 2017, doi:10.1111/imm.12797.
16. Blaylock, Russell. "Immunoregulatory mechanisms in glioma proliferation, invasion and occasional metastasis." *Surgical Neurology International*, vol. 4, no. 1, 2013, p. 15., doi:10.4103/2152-7806.106577.
17. Bokara, Kiran Kumar, et al. "Influence of lead acetate on glutathione and its related enzymes in different regions of rat brain." *Journal of Applied Toxicology*, vol. 29, no. 5, 2009, pp. 452–458., doi:10.1002/jat.1423.
18. Zamroziewicz, Marta K., et al. "Nutritional status, brain network organization, and general intelligence." *NeuroImage*, 2017, doi:10.1016/j.neuroimage.2017.08.043.
19. Fernández, Shirley Steffany Muñoz, et al. "Nutritional Strategies in the Management of Alzheimer Disease: Systematic Review With Network Meta-Analysis." *Journal of the American Medical Directors Association*, 2017, doi:10.1016/j.jamda.2017.06.015.
20. Sarubbo, Fiorella, et al. "Effects of Resveratrol and other Polyphenols on the most common Brain Age-Related Diseases." *Current Medicinal Chemistry*, vol. 24, 2017, doi:10.2174/0929867324666170724102743.
21. Sherwin, Eoin, et al. "Recent developments in understanding the role of the gut microbiota in brain health and disease." *Annals of the New York Academy of Sciences*, Feb. 2017, doi:10.1111/nyas.13416.
22. Sherwin, Eoin, et al. "A gut (Microbiome) feeling about the brain." *Current Opinion in Gastroenterology*, vol. 32, no. 2, 2016, pp. 96–102., doi:10.1097/mog.0000000000000244.
23. Stocco, Andrea, et al. "Decreased Methylation of the Mitochondrial D-Loop Region in Late-Onset Alzheimer's Disease." *Journal of Alzheimers Disease*, vol. 59, no. 2, 2017, pp. 559–564., doi:10.3233/jad-170139.
24. Francesco, Andrea Di, et al. "Global changes in DNA methylation in Alzheimer's disease peripheral blood mononuclear cells." *Brain, Behavior, and Immunity*, vol. 45, 2015, pp. 139–144., doi:10.1016/j.bbi.2014.11.002.

25. Guillemin, Gilles J., et al. "Dietary Supplements/Antioxidants: Impact on Redox Status in Brain Diseases." *Oxidative Medicine and Cellular Longevity*, vol. 2017, 2017, pp. 1–2., doi:10.1155/2017/5048432.
26. Byun, Min Soo, et al. "Differential effects of blood insulin and HbA1c on cerebral amyloid burden and neurodegeneration in nondiabetic cognitively normal older adults." *Neurobiology of Aging*, vol. 59, 2017, pp. 15–21., doi:10.1016/j.neurobiolaging.2017.07.004.
27. Schreiber, Stefanie, et al. "Alzheimer Disease Signature Neurodegeneration and APOE Genotype in Mild Cognitive Impairment With Suspected Non-Alzheimer Disease Pathophysiology." *JAMA Neurology*, vol. 74, no. 6, Jan. 2017, p. 650., doi:10.1001/jamaneurol.2016.5349.
28. Kempuraj, Duraisamy, et al. "Brain and Peripheral Atypical Inflammatory Mediators Potentiate Neuroinflammation and Neurodegeneration." *Frontiers in Cellular Neuroscience*, vol. 11, 2017, doi:10.3389/fncel.2017.00216.
29. León-Olea, Martha, et al. "Current concepts in neuroendocrine disruption." *General and Comparative Endocrinology*, vol. 203, 2014, pp. 158–173., doi:10.1016/j.ygcen.2014.02.005.
30. American Congress of Rehabilitative Medicine [ACRM] (1993). Definition of mild traumatic brain injury. *Journal of Head Trauma Rehabil.* 1993;8:86–87. Retrieved from https://www.acrm.org/wp-content/uploads/pdf/TBIDef_English_10-10.pdf Bedard, M., Felteau, M., Cullen, N., Gibbons, C., Dubois, S., Maxwell, H., Moustgaard, A. (2014, August).
31. Mindfulness-based cognitive therapy reduces symptoms of depression in people with a traumatic brain injury: results from a randomized controlled trial. *J Head Trauma Rehabil.*, 29(4), 13-22. PubMed pmid: 24052092. doi: 10.1097/HTR.0b013e3182a615a0.
33. Bonds, B., Yang, S., Kalpakis, K., Stansbury, L., Scalea, T., Stein, DM. (2015, July). Predicting secondary insults after severe traumatic brain injury. *J Trauma AcuteCare Surg.* 79(1): 85-90. PubMed pmid: 26091319. doi: 10.1097/TA.0000000000000698
34. Brock, B., Kharrazian, D., Yanuck, S., Zielinski, G., Pierce, M., Noseworthy, S., Powell, M. (2013). The potential impact of various physiological mechanisms on outcomes in TBI, mTBI, concussion and PPCS. *Funct Neurol Rehabil Ergon*, 3(2-3)
35. Carrick, F. R., McLellan, K., Brock, J. B., Randall, C., & Oggero, E. (2015a). Evaluation of the Effectiveness of a Novel Brain and Vestibular Rehabilitation Treatment Modality in PTSD Patients Who have Suffered Combat-Related Traumatic Brain Injuries. *Frontiers in Public Health*, 3, 15. <http://doi.org.ezpprod1.hul.harvard.edu/10.3389/fpubh.2015.00015>
36. Carrick, F. R., Pagnacco, G., McLellan, K., Solis, R., Shores, J., Fredieu, A., ... Oggero, E. (2015b). Short- and Long-Term Effectiveness of a Subject's Specific Novel Brain and Vestibular Rehabilitation Treatment Modality in Combat Veterans Suffering from PTSD. *Frontiers in Public Health*, 3, 151. <http://doi.org.ezpprod1.hul.harvard.edu/10.3389/fpubh.2015.00151>
38. Carroll, LJ., Cassidy, JD., Peloso, PM., Borg J., Von Holst, H., Holm, L., Paniac, C.,
39. Pepin, M. (2004, Feb). Incidence, risk factors and prevention of mild traumatic brain injury: Results of the WHO collaborating centre task force on mild traumatic brain injury. *Journal of Rehabilitation Medicine*, 36(43) 28–60. PubMed pmid: 15083870. doi: 10.1080/16501960410023732
40. 28. Hadanny, A., & Efrati, S. (2016, July 4). Treatment of persistent post-concussion syndrome due to mild traumatic brain injury: current status and future directions. *Expert Review of Neurotherapeutics*, 16(8), 875–887. PubMed pmid: 27337294. doi: 10.1080/14737175.2016.1205487
41. Hitier, M., Besnard, S., & Smith, P. (2014, July, 2014). Vestibular pathways involved in cognition. *Integrative Neuroscience*, 8(59). PubMed pmid: 25100954. doi: 10.3389/fnint.2014.00059
42. Fauth, M., & Tetzlaff, C. (2016, June, 28). Opposing Effects of Neuronal Activity on Structural Plasticity. *Front. Neuroanat.* 10(75). PubMed pmid: 27445713. doi.org/http://dx.doi.org/10.3389/fnana.2016.00075
43. Gardner, R., & Yaffe, K. (2015, May 6). Epidemiology of mild traumatic brain injury and neurodegenerative disease. *Mol Cell Neurosci.* 66, 134-41. PubMed pmid: 25748121. PMID: PMC4461453. doi: 10.1016/j.mcn.2015.03.001 Gay, M. (2016, Sep). Treatment Perspectives Based on Our Current Understanding of Concussion. *Sports Med Arthrosc.*, 24(3):134-41. PubMed pmid: 27482780. doi: 10.1097/JSA.0000000000000124
44. Gottshall, K. (2011). Vestibular rehabilitation after mild traumatic brain injury with vestibular pathology. *NeuroRehabilitation.* 29, 167-71. PubMed pmid: 22027078. doi: 10.3233/NRE-2011-0691
45. Hitier, M., Besnard, S., & Smith, PF. (2014, July). Vestibular pathways involved in cognition. *INTEGRATIVE NEUROSCIENCE*. PubMed pmid: 25100954. PMID: PMC4107830. doi.org/10.3389/fnint.2014.00059
46. Jaramillo, C., Eapen, B., Tate, D., Balden, V., Kennedy, J., Bunner, A., & Cooper, D. B. (2015, September). Treatment of persistent post-concussive symptoms after mild traumatic brain injury: a systematic review of cognitive rehabilitation and behavioral health interventions in military service members and veterans. *Brain Imaging and Behavior*, 9(3):403-20. PubMed pmid: 26330376. doi: 10.1007/s11682-015-9440-2
47. Lew, H., Ochs, A., Cifu, D., Walker, W., & Frank, L. (2012, Nov). Sensory integrative dysfunction underlying vestibular disorders after traumatic brain injury: a review. *Rehabil Res Dev.*, 49(7), 985-94. doi.org/10.1682/JRRD.2011.12.0250
48. Lovell, M. (2015). ImPACT: An Evidence-Based and Comprehensive Concussion Management Program. ImPACT Research Report, 3. Retrieved from https://www.impacttest.com/_admin/uploads/research-report-q2-2015-final.pdf
49. Maroon, JC, Lepere, DB, Blaylock, RL, Bost, JW. (2012, Nov). Postconcussion syndrome: A review of pathophysiology and potential nonpharmacological approaches to treatment. *Phys Sportsmed.* 40(4):73-87. PubMed pmid: 23306417. doi: 10.3810/psm.2012.11.1990.

50. Mizobuchi, Y., & Nagahiro, S. (2016, April 12). A Review of Sport-Related Head Injuries. *J. Neurotrauma.*, (1):1-18. PubMed pmid: 27182494 PMCID: PMC4866563. doi: 10.1089/neu.2013.3079.
51. 39. Ostry, DJ., & Gribble, PL. (2016, Feb). Sensory Plasticity in Human Motor Learning. *Trends Neurosci.* 39(2):114-23. PubMed pmid: 26774345. PMCID: PMC4737984. doi: 10.1016/j.tins.2015.12.006
52. 40. Potter, SD., Brown, RG., & Fleminger, S. (2016, Aug 5). Randomised, waiting list controlled trial of cognitive-behavioural therapy for persistent postconcussional symptoms after predominantly mild-moderate traumatic brain injury. *J Neurol Neurosurg Psychiatry.* PubMed pmid: 27496149. doi.org/10.1136/jnnp-2015- 312838
53. 41. Shen, Q., Hiebert, JB., Hartwell, J., Thimmesch, AR., & Pierce, JD. (2016). SystematicReview of Traumatic Brain Injury and the Impact of Antioxidant Therapy on Clinical Outcomes. *Worldviews on Evidence-Based Nursing*, 13(5):380-389. PubMed pmid: 27243770. doi: 10.1111/wvn.12167
54. 42. Stephens, J., Williamson, K., & Berryhill, M. (2015, Jan). Cognitive Rehabilitation After Traumatic Brain Injury: A Reference for Occupational Therapists. *Occupation, Participation and Health (OTJR)*, 35(1), 5-22. doi: 10.1177/1539449214561765
55. 43. Teasdale, G., Jennett, B. (1974). Assessment of coma and impaired consciousness. A practical scale. *Lancet*, 304(7872), 81-84. doi:10.1016/S0140-6736(74)91639-0 McAllister, TW., Saykin, AJ., Flashman, LA., Sparling, MB., Johnson, SC., Guerin, SJ.,
56. 44. Mamourian, AC., Weaver, JB., Yanofsky, N. (1999, Oct). Brain activation during working memory 1 month after mild traumatic brain injury: a functional MRI study. *Neurology.* 53(6). PubMed pmid: 10522888. Doi: org/ 10. 1212/ WNL. 53. 6. 1300
57. 45. Krellman, WL, Krellman, JW, Dijkers, M. (2016, Feb). Can Cognitive Behavioral Therapy for Insomnia also treat fatigue, pain, and mood symptoms in individuals with traumatic brain injury? - A multiple case report. *NeuroRehabilitation.* 38(1):59-69. doi: 10.3233/NRE-151296
58. 46. Walls, A., et al. (2015). "Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcus Immunology: A Pilot Study." *Otolaryngol Head Neck Surg* 153(1): 130-136.
59. 47. Walls, A., et al. (2016). "Characterization of B-Cells in tonsils of patients diagnosed with pediatric autoimmune neuropsychiatric disorder associated streptococcus." *Int J Pediatr Otorhinolaryngol* 80: 49-52.
60. 48. Cox, C. J., et al. (2015). "Antineuronal antibodies in a heterogeneous group of youth and young adults with tics and obsessive-compulsive disorder." *J Child Adolesc Psychopharmacol* 25(1): 76-85.
61. 49. Gause, C., et al. (2009). "Antineuronal antibodies in OCD: comparisons in children with OCD-only, OCD+chronic tics and OCD+PANDAS." *J Neuroimmunol* 214(1-2): 118-124.
62. 50. Snider, L. A. and S. E. Swedo (2004). "PANDAS: current status and directions for research." *Mol Psychiatry* 9(10): 900-907.
63. 51. Helm, C. E. and R. A. Blackwood (2015). "Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal Infections (PANDAS): Experience at a Tertiary Referral Center." *Tremor Other Hyperkinet Mov (N Y)* 5: 270.
64. 52. Macerollo, A. and D. Martino (2013). "Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS): An Evolving Concept." *Tremor Other Hyperkinet Mov (N Y)*
65. 53. Orefici, G., et al. (2016). Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS). *Streptococcus pyogenes: Basic Biology to Clinical Manifestations.* J. J. Ferretti, D. L. Stevens and V. A. Fischetti. Oklahoma City (OK), University of Oklahoma Health Sciences Center
66. 54. [Pest Manag Sci](#). 2014 Jul 23. doi: 10.1002/ps.3863. [Epub ahead of print] Perspectives on Transgenic, Herbicide-Resistant Crops in the USA Almost 20 Years after Introduction.
67. APPLIED NUTRITIONAL SCIENCE REPORTS Copyright © 2002 by Advanced Nutrition Publications, Inc. The Role of Detoxification in the Prevention of Chronic Degenerative Diseases BY DEANN J. LISKA, PH.D
68. [Mol Microbiol](#). 2016 Jun;100(6):928-30. doi: 10.1111/mmi.13395. Epub 2016 Apr 29. A novel pathway of arsenate detoxification., [Zhao FJ](#)
69. Živković, S., Autoimmune Neurologic Disorders. *Current Neuropharmacology* 2011, 9 (3), 399. Rousset, B.; Bernier-Valentin, F.; Poncet, C.; Orgiazzi, J.; Madec, A. M.; Monier, J. C.; Mornex, R., Anti-tubulin antibodies in autoimmune thyroid disorders. *Clin Exp Immunol* 1983, 52 (2), 325-32.
70. Hedegaard, C. J.; Chen, N.; Sellebjerg, F.; Sørensen, P. S.; Leslie, R. G. Q.; Bendtzen, K.; Nielsen, C. H., Autoantibodies to myelin basic protein (MBP) in healthy individuals and in patients with multiple sclerosis: a role in regulating cytokine responses to MBP. *Immunology* 2009, 128 (1 Pt 2), e451-61.
71. Nakashima, I., Anti-myelin oligodendrocyte glycoprotein antibody in demyelinating diseases. *Clinical and Experimental Neuroimmunology* 2015, 6 (S1), 59-63.
72. Simons, M., Overexpression of the myelin proteolipid protein leads to accumulation of cholesterol and proteolipid protein in endosomes/lysosomes: implications for Pelizaeus-Merzbacher disease. 2002, 157 (2), 327-36.
73. Warren, K. G.; Catz, I., Relative frequency of autoantibodies to myelin basic protein and proteolipid protein in optic neuritis and multiple sclerosis cerebrospinal fluid. *J Neurol Sci* 1994, 121 (1), 66-73.

74. Sellebjerg, F. T.; Frederiksen, J. L.; Olsson, T., Anti-myelin basic protein and anti-proteolipid protein antibody-secreting cells in the cerebrospinal fluid of patients with acute optic neuritis. *Archives of neurology* 1994, 51 (10), 1032-6.
75. Yamasaki, R., Anti-neurofascin antibody in combined central and peripheral demyelination. *Clinical and Experimental Neuroimmunology* 2013, 4 (s1), 68-75.
76. Ogata, H.; Yamasaki, R., Anti-neurofascin 155 antibody-related neuropathy. *Clinical and Experimental Neuroimmunology* 2018, 9 (1), 54-64.
77. Mathey, E. K.; Derfuss, T.; Storch, M. K.; Williams, K. R.; Hales, K.; Woolley, D. R.; Al-Hayani, A.; Davies, S. N.; Rasband, M. N.; Olsson, T.; Moldenhauer, A.; Velhin, S.; Hohlfeld, R.; Meinl, E.; Linington, C., Neurofascin as a novel target for autoantibody-mediated axonal injury. *The Journal of Experimental Medicine* 2007, 204 (10), 2363-2372.
78. Kawamura, N.; Yamasaki, R.; Yonekawa, T.; Matsushita, T.; Kusunoki, S.; Nagayama, S.; Fukuda, Y.; Ogata, H.; Matsuse, D.; Murai, H.; Kira, J.-i., Anti-neurofascin antibody in patients with combined central and peripheral demyelination. *Neurology* 2013, 81 (8), 714-722.
79. Svahn, J.; Petiot, P.; Antoine, J.-C.; Vial, C.; Delmont, E.; Viala, K.; Steck, A. J.; Magot, A.; Cauquil, C.; Zarea, A.; Echaniz-Laguna, A.; Iancu Ferfoglita, R.; Gueguen, A.; Magy, L.; Léger, J.-M.; Kuntzer, T.; Ferraud, K.; Lacour, A.; Camdessanché, J.-P., Anti-MAG antibodies in 202 patients: clinicopathological and therapeutic features. *Journal of Neurology, Neurosurgery & Psychiatry* 2017.
80. Bargerstock, E.; Puvenna, V.; Iffland, P.; Falcone, T.; Hossain, M.; Vetter, S.; Man, S.; Dickstein, L.; Marchi, N.; Ghosh, C.; Carvalho-Tavares, J.; Janigro, D., Is peripheral immunity regulated by blood-brain barrier permeability changes? *PLoS One* 2014, 9 (7), e101477.
81. Zhang, Z.; Zoltewicz, J. S.; Mondello, S.; Newsom, K. J.; Yang, Z.; Yang, B.; Kobeissy, F.; Guingab, J.; Glushakova, O.; Robicsek, S.; Heaton, S.; Buki, A.; Hannay, J.; Gold, M. S.; Rubenstein, R.; Lu, X. C.; Dave, J. R.; Schmid, K.; Tortella, F.; Robertson, C. S.; Wang, K. K., Human traumatic brain injury induces autoantibody response against glial fibrillary acidic protein and its breakdown products. *PLoS One* 2014, 9 (3), e92698.
82. Lemke, M. R.; Glatzel, M.; Henneberg, A. E., Antimicroglia antibodies in sera of Alzheimer's disease patients. *Biol Psychiatry* 1999, 45 (4), 508-11.
83. Shimizu, F.; Schaller, K. L.; Owens, G. P.; Cotleur, A. C.; Kellner, D.; Takeshita, Y.; Obermeier, B.; Kryzer, T. J.; Sano, Y.;
84. Kanda, T.; Lennon, V. A.; Ransohoff, R. M.; Bennett, J. L., Glucose-regulated protein 78 autoantibody associates with blood-brain barrier disruption in neuromyelitis optica. *Science Translational Medicine* 2017, 9 (397).
85. Vaishnav, R. A.; Liu, R.; Chapman, J.; Roberts, A. M.; Ye, H.; Rebolledo-Mendez, J. D.; Tabira, T.; Fitzpatrick, A. H.; Achiron, A.; Running, M. P.; Friedland, R. P., Aquaporin 4 Molecular Mimicry and Implications for Neuromyelitis Optica. *J Neuroimmunol* 2013, 260 (0), 92-8.
86. Antoine, J.-C.; Honnorat, J.; Camdessanché, J.-P.; Magistris, M.; Absi, L.; Mosnier, J.-F.; Petiot, P.; Kopp, N.; Michel, D., Paraneoplastic anti-CV2 antibodies react with peripheral nerve and are associated with a mixed axonal and demyelinating peripheral neuropathy. *Annals of Neurology* 2001, 49 (2), 214-221.
87. Yang, Y.; Shum, H.; Haigentz, M.; Mariuma, E.; Suhrland, M.; Maleki, S.; Acevedo, N.; Gulko, E.; Farinhas, J.; Welch, M., Anti-Ri antibody associated paraneoplastic brainstem and cerebellar dysfunction as the presenting sign of small cell lung carcinoma (P4.237). *Neurology* 2015, 84 (14 Supplement).
88. Lee, J. J.; Koh, K. M.; Kim, U. S., The Anti-Acetylcholine Receptor Antibody Test in Suspected Ocular Myasthenia Gravis. *Journal of Ophthalmology* 2014, 2014, 4.
89. Koneczny, I.; Cossins, J.; Vincent, A., The role of muscle-specific tyrosine kinase (MuSK) and mystery of MuSK myasthenia gravis. *Journal of Anatomy* 2014, 224 (1), 29-35.
90. Hill, M., The neuromuscular junction disorders. *Journal of Neurology, Neurosurgery & Psychiatry* 2003, 74 (suppl 2), ii32-ii37.
91. Meriggioli, M. N.; Sanders, D. B., Muscle autoantibodies in myasthenia gravis: beyond diagnosis? *Expert Rev Clin Immunol* 2012, 8 (5), 427-38.
92. Hadjivassiliou, M.; Boscolo, S.; Tongiorgi, E.; Grunewald, R. A.; Sharrack, B.; Sanders, D. S.; Woodroffe, N.; Davies-Jones, G. A., Cerebellar ataxia as a possible organ-specific autoimmune disease. *Mov Disord* 2008, 23 (10), 1370-7.
93. Goines, P., Autoantibodies to cerebellum in children with autism associate with behavior. 2011, 25 (3), 514-23.
94. Venkatraman, A.; Opal, P., Paraneoplastic cerebellar degeneration with antiYo antibodies – a review. *Ann Clin Transl Neurol* 2016, 3 (8), 655-63.
95. Rygiel, K., Novel strategies for Alzheimer's disease treatment: An overview of anti-amyloid beta monoclonal antibodies. *Indian Journal of Pharmacology* 2016, 48 (6), 629-36.
96. Wu, J.; Li, L., Autoantibodies in Alzheimer's disease: potential biomarkers, pathogenic roles, and therapeutic implications. *Journal of Biomedical Research* 2016, 30 (5), 361-72.
97. Levite, M., Glutamate receptor antibodies in neurological diseases: *Journal of Neural Transmission* 2014, 121 (8), 1029-1075.
98. Dale, R. C.; Merheb, V.; Pillai, S.; Wang, D.; Cantrill, L.; Murphy, T. K.; Ben-Pazi, H.; Varadkar, S.; Aumann, T. D.; Horne, M. K.; Church, A. J.; Fath, T.; Brilot, F., Antibodies to surface dopamine-2 receptor in autoimmune movement and psychiatric disorders. *Brain* 2012, 135 (Pt 11), 3453-68.
99. Platt, M. P.; Agalliu, D.; Cutforth, T., Hello from the Other Side: How Autoantibodies Circumvent the Blood–Brain Barrier in Autoimmune Encephalitis. *Front Immunol* 2017, 8.

100. Brudek, T.; Winge, K.; Folke, J.; Christensen, S.; Fog, K.; Pakkenberg, B.; Pedersen, L. Ø., Autoimmune antibody decline in Parkinson's disease and Multiple System Atrophy; a step towards immunotherapeutic strategies. *Molecular Neurodegeneration* 2017, 12 (1), 44.
101. Wallukat, G.; Pruss, H.; Muller, J.; Schimke, I., Correction: Functional autoantibodies in patients with different forms of dementia. *PLoS One* 2018, 13 (8), e0203253.
102. Singh, M.; Prakash, A., Possible role of endothelin receptor against hyperhomocysteinemia and beta-amyloid induced AD type of vascular dementia in rats. *Brain research bulletin* 2017, 133, 31-41. Kayser, M. S.; Dalmau, J., Anti-NMDA Receptor Encephalitis in Psychiatry. *Current psychiatry reviews* 2011, 7 (3), 189-93.
103. Husebye, E. S.; Sthoeger, Z. M.; Dayan, M.; Zinger, H.; Elbirt, D.; Levite, M.; Mozes, E., Autoantibodies to a NR2A peptide of the glutamate/NMDA receptor in sera of patients with systemic lupus erythematosus. *Annals of the Rheumatic Diseases* 2005, 64 (8), 1210-1213.
104. Chang, P. K.; Verbich, D.; McKinney, R. A., AMPA receptors as drug targets in neurological disease--advantages, caveats, and future outlook. *The European journal of neuroscience* 2012, 35 (12), 1908-16. Ben-Pazi, H.; Stoner, J. A.; Cunningham, M. W., Dopamine receptor autoantibodies correlate with symptoms in Sydenham's chorea. *PLoS One* 2013, 8 (9), e73516.
105. Kleppner, S. R.; Tobin, A. J., GABA signalling: therapeutic targets for epilepsy, Parkinson's disease and Huntington's disease. *Expert opinion on therapeutic targets* 2001, 5 (2), 219-39.
106. Boronati, A.; Gelfand, J. M.; Gresa-Arribas, N.; Jeong, H. Y.; Walsh, M.; Roberts, K.; Martinez-Hernandez, E.; Rosenfeld, M. R.; Balice-Gordon, R.; Graus, F.; Rudy, B.; Dalmau, J., Encephalitis and antibodies to DPPX, a subunit of Kv4.2 potassium channels. *Ann Neurol* 2013, 73 (1), 120-8.
107. Carvajal-González, A.; Leite, M. I.; Waters, P.; Woodhall, M.; Coutinho, E.; Balint, B.; Lang, B.; Pettingill, P.; Carr, A.; Sheerin, U. M.; Press, R.; Lunn, M. P.; Lim, M.; Maddison, P.; Meinck, H.; Vandenberghe, W.; Vincent, A., Glycine receptor antibodies in PERM and related syndromes: characteristics, clinical features and outcomes. *Brain* 2014, 137 (8), 2178-92.
108. Gresa-Arribas, N.; Planaguma, J.; Petit-Pedrol, M.; Kawachi, I.; Katada, S.; Glaser, C. A.; Simabukuro, M. M.; Armangue, T.; Martinez-Hernandez, E.; Graus, F.; Dalmau, J., Human neurexin-3alpha antibodies associate with encephalitis and alter synapse development. *Neurology* 2016, 86 (24), 2235-42.
109. Joubert, B.; Saint-Martin, M.; Noraz, N.; Picard, G.; Rogemond, V.; Ducray, F.; Desestret, V.; Psimaras, D.; Delattre, J. Y.; Antoine, J. C.; Honnorat, J., Characterization of a Subtype of Autoimmune Encephalitis With Anti-Contactin-Associated Protein-like 2 Antibodies in the Cerebrospinal Fluid, Prominent Limbic Symptoms, and Seizures. *JAMA neurology* 2016, 73 (9), 1115-24.
110. Mayasi, Y.; Takhtani, D.; Garg, N., Leucine-rich glioma-inactivated protein 1 antibody encephalitis: A case report. *Neurology® Neuroimmunology & Neuroinflammation* 2014, 1 (4).
111. György, B.; Breakefield, X. O.; Tanzi, R. E.; Moir, R. D., Alzheimer's Disease-Associated -Amyloid Is Rapidly Seeded by Herpesviridae to Protect against Brain Infection. *Neuron* 2018, 99 (1), 56-63.e3.
112. Ortega Suero, G.; Sola-Valls, N.; Escudero, D.; Saiz, A.; Graus, F., Anti-Ma and anti-Ma2-associated paraneoplastic neurological syndromes. *Neurologia (Barcelona, Spain)* 2018, 33 (1), 18-27.
113. Eimer, W. A.; Vijaya Kumar, D. K.; Shanmugam, N. K. N.; Rodriguez, A. S.; Mitchell, T.; Washicosky, K. J.; György, B.; Breakefield, X. O.; Tanzi, R. E.; Moir, R. D., Alzheimer's Disease-Associated -Amyloid Is Rapidly Seeded by Herpesviridae to Protect against Brain Infection. *Neuron* 2018, 99 (1), 56-63.e3.
114. Berger, J. R.; Houff, S., Neurological complications of herpes simplex virus type 2 infection. *Archives of neurology* 2008, 65 (5), 596-600.
115. Martelius, T.; Lappalainen, M.; Palomäki, M.; Anttila, V.-J., Clinical characteristics of patients with Epstein Barr virus in cerebrospinal fluid. *BMC Infectious Diseases* 2011, 11 (1), 281.
116. Munger, K. L.; Levin, L. I.; O'Reilly, E. J.; Falk, K. I.; Ascherio, A., Anti-Epstein-Barr virus antibodies as serological markers of multiple sclerosis: a prospective study among United States military personnel. *Multiple sclerosis (Houndmills, Basingstoke, England)* 2011, 17 (10), 1185-93.
117. Ang, C. W.; Jacobs, B. C.; Brandenburg, A. H.; Laman, J. D.; van der Meché, F. G. A.; Osterhaus, A. D. M. E.; van Doorn, P. A., Cross-reactive antibodies against GM2 and CMV-infected fibroblasts in Guillain-Barré syndrome. *Neurology* 2000, 54 (7), 1453-1458.
118. Khalili-Shirazi, A.; Gregson, N.; Gray, I.; Rees, J.; Winer, J.; Hughes, R., Antiganglioside antibodies in Guillain-Barré syndrome after a recent cytomegalovirus infection. *Journal of Neurology, Neurosurgery & Psychiatry* 1999, 66 (3), 376-379.
119. Tejada-Simon, M. V.; Zang, Y. C. Q.; Hong, J.; Rivera, V. M.; Zhang, J. Z., Cross-reactivity with myelin basic protein and human herpesvirus-6 in multiple sclerosis. *Annals of Neurology* 2003, 53 (2), 189-197.
120. Readhead, B.; Haure-Mirande, J. V.; Funk, C. C.; Richards, M. A.; Shannon, P.; Haroutunian, V.; Sano, M.; Liang, W. S.; Beckmann, N. D.; Price, N. D.; Reiman, E. M.; Schadt, E. E.; Ehrlich, M. E.; Gandy, S.; Dudley, J. T., Multiscale Analysis of Independent Alzheimer's Cohorts Finds Disruption of Molecular, Genetic, and Clinical Networks by Human Herpesvirus. *Neuron* 2018, 99 (1), 64-82.e7.
121. Cunningham, M. W., Rheumatic Fever, Autoimmunity and Molecular Mimicry: The Streptococcal Connection. *Int Rev Immunol* 2014, 33 (4), 314-29.
122. Liu, C. C.; Kanekiyo, T.; Xu, H.; Bu, G., Apolipoprotein E and Alzheimer disease: risk, mechanisms, and therapy. *Nature reviews. Neurology* 2013, 9 (2), 106-18.

123. Fasano, A., Intestinal permeability and its regulation by zonulin: diagnostic and therapeutic implications. *Clin Gastroenterol Hepatol* 2012, 10 (10), 1096-100.
124. Caito, S.; Aschner, M., Neurotoxicity of metals. *Handbook of clinical neurology* 2015, 131, 169-89.
125. Reinhard, M. J.; Satz, P.; Scaglione, C. A.; D'Elia, L. F.; Rassovsky, Y.; Arita, A. A.; Hinkin, C. H.; Thrasher, D.; Ordog, G., Neuropsychological exploration of alleged mold neurotoxicity. *Arch Clin Neuropsychol* 2007, 22 (4), 533-43.
126. Bredeisen, D. E., Reversal of cognitive decline: A novel therapeutic program. *Aging (Albany NY)* 2014, 6 (9), 707-17.
127. Dye, R. V.; Miller, K. J.; Singer, E. J.; Levine, A. J., Hormone Replacement Therapy and Risk for Neurodegenerative Diseases. *International Journal of Alzheimer's Disease* 2012, 2012.
128. Carmeli, E., Physical Therapy for Neurological Conditions in Geriatric Populations. *Frontiers in Public Health* 2017, Sijobert, B.; Azevedo-Coste, C.; Andreu, D.; Verna, C.; Geny, C., Effects of Sensitive Electrical Stimulation Based Cueing in Parkinson's Disease: A Preliminary Study. *European Journal of Translational Myology* 2016, 26 (2).
129. Aldehri, M.; Temel, Y.; Alnaami, I.; Jahanshahi, A.; Heschem, S., Deep brain stimulation for Alzheimer's Disease: An update. *Surgical Neurology International* 2018, 9.
130. Muhammad, C. M.; Moonaz, S. H., Yoga as Therapy for Neurodegenerative Disorders: A Case Report of Therapeutic Yoga for Adrenomyeloneuropathy. *Integrative Medicine: A Clinician's Journal* 2014, 13 (3), 33-9.
131. Asakawa, T.; Xia, Y., Can Acupuncture Treat Alzheimer's Disease and Other Neurodegenerative Disorders? In *Current Research in Acupuncture*, Xia, Y.; Ding, G.; Wu, G.-C., Eds. Springer New York: New York, NY, 2013; pp 255-301.
132. Douris, P. C.; Cogen, Z. S.; Fields, H. T.; Greco, L. C.; Hasley, M. R.; Machado, C. M.; Romagnuolo, P. M.; Stamboulis, G.; DiFrancisco-Donoghue, J., The effects of blood flow restriction training on functional improvements in an active single subject with parkinson disease. *International Journal of Sports Physical Therapy* 2018, 13 (2), 247-54.
133. Dommerholt, J., Dry needling — peripheral and central considerations. *J Man Manip Ther* 2011, 19 (4), 223-7.
134. Laukkanen, T.; Kunutsor, S.; Kauhanen, J.; Laukkanen, J. A., Sauna bathing is inversely associated with dementia and Alzheimer's disease in middle-aged Finnish men. *Age Ageing* 2017, 46 (2), 245-249.
135. Scarmeas, N.; Stern, Y.; Tang, M. X.; Mayeux, R.; Luchsinger, J. A., Mediterranean Diet and Risk for Alzheimer's Disease. *Ann Neurol* 2006, 59 (6), 912-21.
136. Kerkick, C.; Willoughby, D., The Antioxidant Role of Glutathione and N-Acetyl-Cysteine Supplements and Exercise-Induced Oxidative Stress. *Journal of the International Society of Sports Nutrition* 2005, 2 (2), 38-44.
137. Brustolin, S.; Giuliani, R.; Félix, T. M., Genetics of homocysteine metabolism and associated disorders. *Braz J Med Biol Res* 2010, 43 (1), 1-7.
138. Stover, P. J., Vitamin B12 and older adults. *Current opinion in clinical nutrition and metabolic care* 2010, 13 (1), 24-7.
139. Gomes, M. B.; Negrato, C. A., Alpha-lipoic acid as a pleiotropic compound with potential therapeutic use in diabetes and other chronic diseases. *Diabetology & Metabolic Syndrome* 2014, 6.