Nouchine HADJIKHANI, MD, PhD

Curriculum Vitae

Martinos Center for Biomedical Imaging
Massachusetts General Hospital
Harvard Medical School
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Gillberg Neuropsychiatry Center
Sahlgrenska Academy
Gothenburg University
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Google scholar citations: ~19'700, h-index: 63

Current Research Topics

- Emotion perception in autism
- Face perception in neurodevelopmental disorders
- Biomarkers for mental health vulnerability
- Pain processing in migraine
- Neuroinflammation
- Methods: behavioral, neuropsychological: behavioral, psychophysics, eye-tracking, neuro-imaging (fMRI, MEG)

Employment & Degrees

2019 -	**Professor in Experimental Child and Adolescent Psychiatry,** Sahlgrenska Academy, Gothenburg University, Sweden
2016 -	**Associate Neuroscientist, Massachusetts General Hospital, Boston**
2015 -	**Director, Neurolimbic Research, Martinos Center for Biomedical Imaging, MGH, Boston**
2006 -	**Associate Professor in Radiology, Harvard Medical School, Boston**
2013 - 2019	Visiting Professor, Gillberg Center, Sahlgrenska Academy, Gothenburg University, Sweden
2006 – 2012	Director, Social Cognition Laboratory, Swiss Federal Institute of Technology, Lausanne
2006 - 2012	Professeur Boursier, Brain Mind Institute, Swiss Federal Institute of Technology, Lausanne
2005 – 2014	Affiliated Faculty, Massachusetts Institute of Technology, Cambridge
2002 – 2005	Assistant Professor, Radiology, Harvard Medical School, Boston
1999 – 2002	Instructor, Radiology, Harvard Medical School, Boston
1997 – 1999	Post-doctoral Research Fellow, Radiology, Harvard Medical School, Boston
1995 – 1996	Post-doctoral Research Fellow, Laboratory for Brain Research and Position Emission Tomography, Karolinska Institute, Stockholm, Sweden
1993 – 1995	Research Fellow, Anatomy and Physiology, University of Lausanne, Switzerland
1993	Research Fellow, Neuropediatric, Lausanne University Hospital, Switzerland
2017	Licensed Physician, Sweden
2010	PhD in Neuroscience, Tilburg University, The Netherlands
1995	Doctorate in Medicine, University of Lausanne, Switzerland
1992	Licensed Physician, University of Lausanne, Switzerland

Honors and Awards

1995	Fellowship award from Swedish Institute, Stockholm, Sweden
1995	Fellowship award from Grant, Swiss National Foundation

1995	Fellowship award from, Société Académique Vaudoise, Switzerland
2002	RO1, NINDS
2005	Swiss National Foundation Professeur Boursier Grant
2008	Velux Foundation Grant
2008	Stoicescu Fellowship Grant
2010	Leenaards Prize
2012	Chaire d'Excellence Pierre de Fermat, Toulouse, France
2014	MGH Scientific Advisory Committee Poster of Distinction award
2014	F1000 prime
2016	LifeWatch Award

Editorial activities

2002- Ad-Hoc Member, NINDS, National Institutes of Health; ZRG1 BBBP-6, NIH; VISB, NIH; NINDS, NIH; ZRG1 IFCN-E, NIH; NIDDK, NIH; Ad-Hoc Member, ZRG1 BBB-L, NIH; ARRA BBB-P, NIH; CP BBBP-IRG, NIH; NINDS Headache CDEs; DBD, NIH; ZRG1 CFS-N, NIH; ZRG F02B, NIH.

2000- Ad-Hoc Reviewer, Medical Research Council (MRC)UK; Agence d'évaluation de la recherche et de l'enseignement supérieur (AERES) France; Agence nationale de la recherche (ANR) France; The Netherlands Organisation for Health Research and Development (ZonMw); European Research Council (ERC); European Science Foundation (ESF); German-Israeli Foundation for Scientific Research and Development (GIF); Lundbeck Foundation; Swiss National Science Foundation (SNF); Harvard Catalyst Data Ideation Challenge

2000- Ad-Hoc reviewer: Acta Paediatrica; American Journal of Psychiatry; Annals of Neurology; Archives of General Psychiatry; Autism; Autism Research; Biological Psychiatry; Brain; Brain Research; Brain Topography; Cephalagia; Cerebral Cortex; Cognitive Computation; Consciousness and Cognition; Cortex; Current Biology; Development and Psychopathology; ECPN; Emotion; European Journal of Neuroscience; European Review of Applied Psychology; Headache; Human Brain Mapping; Journal of Autism and Developmental Disorders; Journal of Cognitive Neuroscience; Journal of Child Psychology and Psychiatry; Journal of Experimental Psychology; Journal of Nervous and Mental Disease; Journal of Neurodevelopmental Disorders; Journal of Neurophysiology; Journal of Neuroscience; Journal of Neuroradiology; Journal of Physiology; Journal of the International Neuropsychological Society; The Lancet Neurology; Magnetic Resonance in Medicine; Nature Clinical Practice Neurology ; Nature Neuroscience ; Neural Plasticity ; NeuroImage ; NeuroImage Clinical ; Neurologyl Neuropsychologial Neuropsychopharmacology; Neuroscience & Biobehavioral Reviews; Pain; Proceedings of the National Academy of Science, USA; The Proceeding B of the Royal Society; PLoS ONE; Psychiatry and Clinical Neurosciences; Psychiatry Research; Psychopharmacology; Research in Autism Spectrum Disorders; Scientific Reports; Social Cognitive Affective Neuroscience; Stroke; Trends in Cognitive Sciences; Trends in Neurosciences; Vision Research; Visual Neuroscience

2022- Member of the FWO Review College, Fonds Wetenschapplijk Onderzoel Vlaanderen

2013- Academic Editor, PLoS ONE

2019-24 Editorial Board Member, The Journal of Headache and Pain

2022- Editorial Board Member, Neurodiversity

Peer-Reviewed Publications:

1. Thorsson M, Galazka MA, Åsberg Johnels J, **Hadjikhani N**. Influence of autistic traits and communication role on eye contact behavior during face-to-face interaction. Scientific Reports 2024, accepted.
2. Galazka MA, Thorsson M, Kleberg JL, **Hadjikhani N**, Åsberg Johnels J. Pupil contagion variation with gaze, arousal and autistic traits. Scientific Reports 2024, accepted
3. Christensen RH, Ashina H, Al-Khazali AH, Zhang Y, Tolnai D, Poulsen AH, Cagol A, **Hadjikhani** N, Granziera C, Amin FM, Ashina M. Differences in cortical morphology in people with and without migraine: A Registry for Migraine (REFORM) MRI Study. Neurology 2024, accepted

4. Brusaferri L, Alshelh Z, Schnieders JH, Sandström A, Mohammadian M, Morrissey EJ, Kim M, Chane CA, Grmek GC, Murphy JP, Bialobrzewski J, DiPietro A, Klinke J, Zhang Y, Torrado-Carvajal A, Mercaldo N, Akeju O, Wu O, Rosen BR, Napadow V, **Hadjikhani** N, Loggia ML. Neuroimmune activation and increased brain aging in chronic pain patients after the COVID-19 pandemic onset. Brain Behav Immun 2023, 116:259-266 PMID 38081435
5. Thorsson M, Galazka M, Johnson M, Åsberg Johnels J, **Hadjikhani N**. Visuomotor tracking strategies in children: associations with neurodevelopmental symptoms. Experimental Brain Research 2023, epub ahead of print, PMID 38078961
6. Alarifi H, Aldhalaan H, **Hadjikhani** N, Åsberg Johnels J, Alarifi J, Ascenso G, Alabdulaziz R. Machine learning for distinguishing Saudi children with and without autism via eye-tracking data. Child and Adolescent Psychiatry and Mental Health, 2023, 17(1):112 PMID 37777792.
7. Galazka M, Wallin L Thorsson M, Gillberg C, Billstedt E, **Hadjikhani** N, Åsberg Johnels J. Self-reported eye contact sensitivity and face processing in chromosome 22q11.2 deletion syndrome. Journal of Clinical and Experimental Neuropsychology, 2023, 45(6):570-578 PMID 37732542
8. Söderlund GBW, Torvanger S, **Hadjikhani** N, Åsberg Johnels J. Sentence memory recall in adolescents: Effects of motor enactment, keyboarding, and handwriting during encoding. Brain and Behavior 2023;e3226 PMID 37605367
9. **Hadjikhani** N, Åsberg Johnels J. Overwhelmed by the man in the moon? Pareidolic objects provoke increased amygdala activation in autism. Cortex 2023, 164 :144-151 PMID 37209610
10. Thorsson M, Galazka M, Hajjari P, Fernell E, Delafield-Butt J, Gillberg C, Johnson M, Åsberg Johnels J, **Hadjikhani** N. A novel tablet-based motor coordination test performs on par with the Beery VMI subtest and offers superior temporal metrics: findings from children with Pediatric Acute-onset Neuropsychiatric Syndrome. Experimental Brain Research 2023, 241(5):1421-1436 PMID 37052647
11. Thorsson M. Galazka M, Åsberg Johnels J, **Hadjikhani** N. A novel end-to-end dual camera system for eye gaze synchrony assessment in face-to-face interaction. Attention, Perception and Psychophysics 2023, Online ahead of print PMID 37099200.
12. Åsberg Johnels J, Galazka M, Sundqvist M, **Hadjikhani** N. The left visual field bias during face perception aligns with individual differences in reading skills, and is absent in dyslexia. British Journal of Educational Psychology 2022, online ahead of print, PMID 36317253
13. **Hadjikhani** N, Galazka M, Kenet T, Joseph RM, Åsberg Johnels J. Discrepancy between high non-verbal intelligence and low accuracy at reading emotional expressions in the eyes reflects the magnitude of social-emotional difficulties in autism. European Archives of Psychiatry and Clinical Neuroscience 2022, *accepted* PMID 35980452
14. Dinkler L, Yasumitsu-Lovell K, Eitoku M, Fujieda, M, Suganuma, N, Hatakenaka, Y, **Hadjikhani**, N, Bryant-Waugh, R, Råstam, M, Gillberg, C. Early neurodevelopmental problems and risk for avoidant/restrictive food intake disorder (ARFID) in 4-7-year-old children: a Japanese birth cohort study. JCPP Advances 2022, *accepted*
15. Christensen RH, Gollion C, Amin FM, Moskowitz MA, **Hadjikhani** N, Ashina M. Imaging the inflammatory phenotype in migraine. The Journal of Headache and Pain, 2022, 23(1):60 PMID 35650524
16. Brusaferri L, Alshelh Z, Martins D, Kim M, Weerasekera A, Housman H, Morrisey EJ, Knight PC, Castro-Blanco KA, Albrecht D, Tseng C, Zu□rcher NR, Ratai EM, Johnson-Akeju O, Makary M, Mercaldo ND, **Hadjikhani N**, Veronese M, Turkheimer F, Rosen BR, Hooker JM, Loggia M. The Pandemic Brain: neuroinflammation in non-infected individuals during the COVID-19 pandemic.Brain Behavior and Immunity, 2022, 102:89-97. PMID 35181440
17. Terrier LM, **Hadjikhani N**, Destrieux C. The trigeminal pathways – A review. Journal of Neurology 2022,269(7):3443-3460. PMID 35249132
18. Åsberg Johnels J, **Hadjikhani N**, Sundquist M, Galazka M. Face processing in school children with dyslexia: neuropsychological and eye-tracking findings. Developmental Neuropsychology 2022, 47(2):78-92 PMID 35148650
19. Müller J, Sinnecker T, Wendebourg MJ, Schläger R, Kuhle J, Schädelin S, Benkert P, Derfuss T, Cattin P, Jud C, Spiess F, Amann M, Lincke T, Barakovic M, Cagol A, Tsagkas C, Parmar K, Pröbstel AK, Reimann S, Asseyer S, Duchow A, Brandt A, Ruprecht K, **Hadjikhani** N, Fukumoto S, Watanabe M, Masaki K,

Matsushita T, Isobe N, Kira JI, Kappos L, Würfel J, Granziera C, Friedemann P, Yaldizli Ö. Choroid Plexus Volume in Multiple Sclerosis versus Neuromyelitis Optica Spectrum Disorder: a retrospective, cross-sectional analysis Neurology: Neuroimmunology & Neuroinflammation 2022, Feb25;9(3):e1147.

20. Wiggers A, Ashina H, **Hadjikhani** N, Sagare A, Zlovic BV, Lauritzen M, Ashina M. Brain Barriers and Their Potential Role in Migraine Pathophysiology. Journal of Headache and Pain 2021 accepted.
21. Andréen L, Galazka M, **Hadjikhani** N, Jeuris S, Masulli P, Åsberg Johnels J. Developing tolerance to eye contact in autism: A feasibility study with adults using behavioral, interview, and psychophysiological data. Psychology of Language and Communication 2022 *accepted*.
22. Masulli P, Galazka M, Eberhard D, Åsberg Johnels J, Gillberg C, **Hadjikhani** N, Andersen TS. Data-driven analysis of gaze patterns in face perception: Methodological and clinical contributions. Cortex 2021 147:9-23. PMID 34998084
23. Dinkler L, Yasumitsu-Lovell K, Eitoku M, Fujieda, M, Suganuma, N, Hatakenaka, Y, **Hadjikhani**, N, Bryant-Waugh, R, Råstam, M, Gillberg, C. Development of a parent-reported screening tool for avoidant/restrictive food intake disorder (ARFID) : Initial validation and prevalence in 4-7-year-old Japanese children. Appetite 2022 168:105735. PMID 34626573
24. Fischi-Gomez E, Bonnier G, Ward N, Granziera C, **Hadjikhani N**. Ultra-high field in vivo characterization of microstructural abnormalities in the orbitofrontal cortex and amygdala in autism. European Journal of Neurosciences, 2021 54(6):6229-6236. PMID 34390517
25. Galazka M, **Hadjikhani** N, Sundqvist M, Åsberg Johnels J. Facial processing speech in children with and without dyslexia. Annals of Dyslexia. 2021, *in press*
26. **Hadjikhani N,** Vincent M. Visual perception in migraine: a narrative review. Vision.2021 April 28;5(2)20. PMID 33924855.
27. Ashina M, Terwindt GM, Al-Karagholi MA, de Boer I, Lee MJ, Hay DL, Schulte LH, **Hadjikhani** N, Sinclair AJ, Ashina H, Schwedt TJ, and Goadsby PJ. Migraine: disease characterisation, biomarkers, and precision medicine. Lancet. 2021 Apr 17;397(10583):1496-1504. PMID: 33773610.
28. Caly H, Rabiei H, Coste-Mazeau P, Hantz S, Alain S, Eyraud JL, Chianea T, Caly C, Makowski D, **Hadjikhani** N, Lemonnier E, and Ben-Ari Y. Machine learning analysis of pregnancy data enables early identification of a subpopulation of newborns with ASD. Sci Rep. 2021 Mar 25;11(1):6877. PMID: 33767300.
29. **Hadjikhani N,** Vincent M. Can you have a migraine aura without knowing it? Current Opinions in Neurology, 2021, Jun 1;34(3):350-355. PMID 33661163.
30. Terrier LM, **Hadjikhani** N, Velut S, Magnain C, Amelot A, Bernard F, Zöllei L. Destrieux C. The trigeminal system: the meningovascular complex. A review. Journal of Anatomy, 2021, *in press*
31. Xie Y, Ksander J, Gutchess A, **Hadjikhani** N, Ward N, Boshyan J, Zebrowitz L. Age differences in neural activation to face trustworthiness: Voxel pattern and activation level assessments. Cognitive, Affective, and Behavioral Neuroscience, 2021, *in press*
32. Dinkler L, Taylor MJ, Råstam M, **Hadjikhani** N, Bulik CM, Lichtenstein P, Gillberg C, Lundström S. Anorexia nervosa and autism: A prospective twin cohort study. Journal of Child Psychology and Psychiatry, 2021, Mar;62(3):316-326. PMID 32496594.
33. Dinkler L, Taylor MJ, Råstam M, **Hadjikhani** N, Bulik CM, Lichtenstein P, Gillberg C, Lundström S. Association of etiological factors across the extreme end and continuous variation in disordered eating in female Swedish twins. Psychological Medicine, 2021 Apr;51(5):750-760. PMID 31843035
34. Lemonnier E, Rabiei H, Makowski D, **Hadjikhani N**, Ben-Ari Y. Treating autism with bumetanide: are large multicentric and monocentric trials on selected populations complementary? Journal of the American Academy of Child & Adolescent Psychiatry, 2020, dec 29;S0890-8567(20)32224-3.PMID 33385505
35. Sotoodeh MS, Taheri-Torbati H, **Hadjikhani** N, Lassalle A. Preserved action recognition in children with autism spectrum disorders: evidence from an EEG and eye-tracking study. Psychophysiology 2020, in press.
36. Sarovic D, **Hadjikhani** N, Schneiderman J, Lundström S, Gillberg C. Autism classified by MRI: a pilot study of a potential diagnostic tool. International Journal of Methods in Psychiatric Research, 2020, Dec;29(4)1-18. PMID 32945591

37. **Hadjikhani** N, Albrecht DS, Mainero C, Ichijo E, Ward N, Granziera C, Zurcher NR, Akeju O, Bonnier G, Price J, Hooker J, Napadow V, Nahrendorf M, Loggia ML, Moskowitz MA. Extra-axial inflammatory signal in parameninges in migraine with visual aura. Annals of Neurology, 2020, Jun;87(6):939-949.
38. Zürcher NR, Loggia ML, Mullett JE, Tseng CE, Bhanot A, Richey L, Hightower B, Wu C, Parmar AJ, Butterfield RI, Dubois JM, Chonde D, Izquierdo-Garcia D, Wey HY, Catana C, **Hadjikhani** N, McDougle CJ, Hooker JM. [11C]PBR28 MR-PET imaging reveals lower regional brain expression of translocator protein (TSPO) in young adult males with autism. Molecular Psychiatry, 2020, *in press*
39. Kerem L, **Hadjikhani N**, Holsen L, Lawson E, Plessow F. Oxytocin reduces the functional connectivity between brain regions involved in eating behaviors in men with overweight and obesity. International Journal of Obesity 2020, May;44(5):980-989 PMID 31740723
40. Cárdenas-de-la-Parra A. Martin-Brevet,S. Moreau C. Rodriguez-Herreros B, Fonov VS, Maillard AM, Zu?rcher NR, 16p11.2 European Consortium, **Hadjikhani** N, Beckmann JS, Reymond A, Draganski B, Jacquemont S, Louis Collins D, Developmental trajectories of neuroanatomical alterations associated with the 16p11.2 Copy Number Variations, NeuroImage 2019, Dec; 203:116155 PMID 31494251
41. Karlsson M, Galazka M, Gillberg C, Cillberg C, Miniscalo C, Billstedt E, **Hadjikhani** N, Åsberg Johnels J. Social Scene Perception in Autism Spectrum Disorders: An Eye-tracking and Pupillometric study. Journal of Clinical and Experimental Neuropsychology, 2019, Dec;41(10)1024-1032. PMID 31362564
42. **Hadjikhani** N, Vincent M. Neuroimaging clues of migraine aura. The Journal of Headache and Pain 2019, Apr 3;20(1):32. PMID 30943894
43. Dinkler L, Rydberg Dobrescu S, Råstam M, Gillberg C, Gillberg C, Wentz E, **Hadjikhani** N. Visual scanning during emotion recognition in long-term recovered anorexia nervosa: an eye-tracking study. International Journal of Eating Disorders 2019, Mar 4. doi: 10.1002/eat.23066. [Epub ahead of print]. PMID 30828832
44. Albrecht D, Mainero C, Ichijo E, Ward N, Granziera C, Zurcher NR, Akeju O, Bonnier G, Price J, Hooker J, Napadow V, Loggia M, **Hadjikhani** N. Imaging of neuroinflammation in migraine with aura- a [11C]PBR28 PET/MRI study. Neurology 2019, Apr 23 ;92(17) :e2038-e2050 PMID 30918090
45. Orekhova EV, Stroganova TA, Schneiderman JF, Lundström S, Riaz B, Sarovic D, Sysoeva OV, Brant G, Gillberg C, **Hadjikhani** N. Neural gain control measured through cortical gamma oscillations is associated with sensory sensitivity. Human Brain Mapping, Human Brain Mapping 2019, Apr 1;40(5):1583-1593 PMID 30549144
46. Galazka-Carney M, Åsberg Johnels J, Zürcher NR, Hippolyte L, Lemonnier E, Billstedt E, Gillberg C, **Hadjikhani** N. Pupillary Contagion in Autism. *Psychological Science* 2019 Feb;30(2):309-315
47. Lassalle A, Zürcher NR, Hippolyte L, Billstedt E, Porro CA, Benuzzi F, Solomon P, Prkachin K, Lemonnier E, Gillberg C, Åsberg Johnels J, **Hadjikhani** N. Effect of visual stimuli of pain on empathy brain network in people with and without Autism Spectrum Disorder. *European Journal of Neuroscience* 2018, Sep ;48(6) :2333-2342. PMID 30168869.
48. Orekhova EV, Sysoeva OV, Schneiderman JF, Lundström S, Galuta IA, Goiaeva DE, Prokovyev AO, Riaz B, Keeler C, **Hadjikhani** N, Gillberg C, Stroganova TA. Input-dependent modulation of MEG gamma oscillations reflects gain control in the visual cortex. *Scientific Reports* 2018 May 31;8(1):8451 PMID 29855596
49. Lassalle A, Zürcher NR, Porro CA, Benuzzi F, Hippolyte L, Lemonnier E, Åsberg Johnels J, **Hadjikhani** N. Influence of anxiety and alexithymia on brain activation associated with the perception of others' pain in autism. *Social Neuroscience* 2018; 7(1-9). PMID: 29683406
50. Curie A, Friocourt G, des Portes V, Roy A, Nazir T, Brun A; Cheylus A, Marcorelles P, Retzepi K, Maleki N, Bussy G, Paulignan Y, Reboul A, Ibarrola D, Kong J, **Hadjikhani** N, Laquerrière A, Gollub RL. Basal ganglia involvement in ARX patients: the reason for ARX patients very specific grasping? *NeuroImage Clinical* 2018; Apr 5 ;19 :454-465. PMID 29984154
51. Martin-Brevet S, Rodriguez-Herreros B, Nilesen JA, Moreau C, Modenato C, Maillard AM, Pain A, Richetin S, Jønch AE, Qureshi AY, Zürcher NR, Conus P, 16p11.2 European Consortium, Simons Variation in Individuals Project (VIP) Consortium, Chung WK, Sherr EH, Spiro JE, Kherif F, Beckmann JS, **Hadjikhani** N, Reymond A, Buckner RL,Draganski B, Jacquemont S. Quantifying the effects of the 16p11.2 copy number variants on brain structure: A multi-site 'genetic-first' study. 2018, *Biological Psychiatry*, 2018 Aug 15;84(4):253-264. doi: 10.1016/j.biopsych.2018.02.1176. Epub 2018 Mar 27.

52. **Hadjikhani** N, Åsberg Johnels J, Lassalle A, Zürcher NR, Hippolyte L, Gillberg C, Lemonnier E, Ben-Ari Y. Bumetanide for Autism : more eye-contact, less amygdala activation. *Scientific Reports 2018, 8:3602 | DOI:10.1038/s41598-018-21958-x*
53. Zebrowitz L, Ward N, Boshyan J, Gutchess A, **Hadjikhani** N. Older Adults' Neural Activation in the Reward Circuit is Sensitive to Face Trustworthiness. *Cognitive, Affective, & Behavioral Neuroscience*, 2017, Dec 6. doi: 10.3758/s13415-017-0549-1. [Epub ahead of print]
54. Bader M, Tannock R, **Hadjikhani** N. The Zappel-Philipp a historical example of ADHD Clinics. *Atten Defic Hyperact Disord*, 2017, Sep 13. doi: 10.1007/s12402-017-0239-4. [Epub ahead of print]
55. Schmelkin C, Plessow F, Thomas JJ, Gray EK, Marengi DA, Pulumo R, Miller KK, **Hadjikhani** N, Franko DL, Eddy K, Lawson EA. Low oxytocin levels are related to alexithymia in anorexia nervosa. *International Journal of Eating Disorders*, 2017 ;50 :1332-1338.
56. Lassalle A, Åsberg Johnels J, Zurcher NR, Hippolyte L, Billstedt E, Ward N, Lemonnier E, Gillberg C. **Hadjikhani N**. Hypersensitivity to low intensity fearful faces in autism when fixation is constrained to the eyes. *Human Brain Mapping* 2017, Dec;38(12):5943-5957. doi: 10.1002/hbm.23800.
57. **Hadjikhani N**, Åsberg Johnels J,Zurcher NR, Lassalle A, Guillon Q, Hippolyte L, Billstedt E, Ward N, Lemonnier E, Gillberg C. Look me in the eyes: constraining gaze in the eye region provokes abnormally high subcortical activation in autism. *Scientific Reports* 2017, 2017, Jun 9;7(1):3163. doi: 10.1038/s41598-017-03378-5
58. Garcia RG, Lin RL, Lee J, Kim J, Barbieri R, Sclocco R, Wasan A, Edwards R, Rosen BR, **Hadjikhani** N, Napadow V. Modulation of Brainstem Activity and Connectivity by Respiratory-gated Auricular Vagal Afferent Nerve Stimulation (RAVANS) in migraine patients. *PAIN* 2017, Aug;158(8):1461-1472. doi: 10.1097/j.pain.0000000000000930
59. **Hadjikhani** N, Zurcher N, Lassalle A, Hippolyte L, Ward N, Åsberg Johnels J. The effect of constraining eye-contact during emotional face perception – an fMRI study. *Social Cognitive and Affective Neuroscience* 2017, Apr 11. doi: 10.1093/scan/nsx046. [Epub ahead of print.
60. Zebrowitz L, Boshyan J, Ward N, Gutchess A, **Hadjikhani** N. The Older Adult Positivity Effect in Evaluations of Trustworthiness Emotion : Regulation or Cognitive Capacity ? *PLoS One* 2017, Jan 6;12(1):e0169823. doi: 10.1371/journal.pone.0169823.
61. Elllingsen DM, Garcia RG, Lee J, Lin RL, Kim J, Thurler AH, Castel S, Dimisko L, Rosen BR, **Hadjikhani** N, Kup B, Napadow V. Cyclic Vomiting Syndrome is characterized by altered functional brain connectivity of the insular cortex: A cross-comparison with migraine and healthy adults. *Neurogastroenterology and Motility* 2016 Dec 1. doi: 10.1111/nmo.13004. [Epub ahead of print]
62. Åsberg Johnels J, Hovey D, Zurcher N, Hippolyte L, Lemonnier E, Gillberg C, **Hadjikhani N**. Autism and emotional viewing. *Autism Research* 2016 Nov 28. doi: 10.1002/aur.1730. [Epub ahead of print]
63. Lee J, Lin RL, Garcia RG, Kim J, Loggia ML, Mawla I, Wasan AD, Edwards R, Rosen BR, **Hadjikhani** N, Napadow V. Reduced insula habituation associated with amplification of trigeminal brainstem input in migraine. *Cephalalgia*, 2016, May 6. pii: S0006-8993(16)30359-6. doi: 10.1016/j.brainres.2016.05.007. [Epub ahead of print].
64. Zebrowitz L, Ward N, Boshyan J, Gutchess A, **Hadjikhani** N. Dedifferentiated Face Processing in Older Adults is Linked to Lower Resting State Metabolic Activity in Fusiform Face Area. *Brain Research*, 2016, 1;1644:22-31.
65. Meeren HKM, **Hadjikhani** N, Ahlfors SP, Hämäläinen MS, de Gelder B. Early preferential response to fear stimuli in human right dosal visual stream – a MEG study. *Scientific Reports*, 2016, 6:24831.
66. Guillon Q, Roge B, Afzali MH, Baduel S, Kruck J, **Hadjikhani** N. Intact perception but abnormal orientation towards face-like objects in young children with ASD. *Scientific Reports*, 2016, 6;22119.
67. Curie A, Brun A, Cheylus A, Reboul A, Nazir T, Bussy G, Delange K, Paulignan Y, Mercier S, David A, Marigner S, Merle L, de Freminville B, Prieur F, Till M, Mortemousque I, Toutain A, Bieth E, Touraine R, Sanlaville D, Chelly J, Kong J, Ott D, Kassai B, **Hadjikhani** N, Gollub R, de Portes V. A novel analog reasoning paradigm: new insights in intellectually disabled patients. *PLoS One* 2016, 11(2):e0149717.
68. Hippolyte L, Maillard AM, Rodriguez-Herreros B, Pain A, Martin-Brevet S, Ferrari C, Conus P, Macé A, **Hadjikhani** N, Metspalu A, Reigo A, Kolk A, Männik K, Barker M, Isidor B, Le Caignec C, Mignot C, Schneider L, Mottron L, Keren B, Albert D, Doco-Fenzy M, Gérard M. Bernier R, Goin-Kochel RP, Hanson E, Green Snyder L, 16p11.2 European Consortium, The Simons VIP Consortium, Ramus F, Beckmann JS,

Draganski B, Reymond A, Jacquemont S. The number of genomic copies at the 16p11.2 locus modulates language, verbal memory and inhibition. *Biological Psychiatry* 2016, 80(2):129-39.

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70. Guillon Q, Afzali MH, Roge B, Baduel S, Kruck J, **Hadjikhani** N. The importance of networking in autism gaze analysis. *PLoS One* 2015 10(10)e0141191.
71. Østergaard L, Dreier JP, **Hadjikhani** N, Jespersen SN, Dirnagl U, Dalkara T. Neurovascular coupling during cortical spreading depolarization and depression. *Stroke* 2015 46(5) :1395-401
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Participation in TV scientific programs

Emission 36.9, Au ?ase? du cerveau autiste, TSR 2010
Emission Spécimen, La Peur au Ventre, TSR 2011
The History Channel – How the Earth Made Man, 2012
France 2 – Le Cerveau d'Hugo, Escazal Productions 2012 (scientific advisor)
Emission Specimen, Comment avoir une idée géniale, TSR 2012
Autisme: Lire les intentions Webdocumentaire 2012
Emission 36.9, Migraine: le ?ase-tête, TSR 2013
Le Webdoc de l'Autisme 2013
Kobra, Swedish Television – We see faces everywhere 2014
Fear: Wherefore, Whence – The Helix Center, 2016
Autism and the Mind/Brain – The Helix Center 2016
Migraine de Folie, movie, TSR 2017
Ministère de l'Education Nationale (France): Enfants autistes: bienvenue à l'école! 2018

Selected Press Coverage

2006 Clinical Neurology News: Pain and Headache, Image of the Month
2007 The Washington Post: Brain Differences Seen in Migraine Sufferers
2007 The Boston Globe: Migraine study shows brain change
2007 The Guardian: Severe headaches may cause other pains, study suggests
2007 BBC news: Migraine brains 'are different'
2007 Reuters: Brain Differences detected in Migraine Sufferers
2007 American Academy of Neurology: Brain Differences found in people with migraine.
2007 WebMD: Migraine sufferers have different brains
2007 U.S. News & World Report: Migraine Tied to Thickening in Brain Area
2007 CBS News: Migraine sufferer's brain show changes in pain-sensing areas
2007 Science Daily: Brain Differences Found in People with Migraine
2007- Listing in Who's Who
2008 Nature Clinical Practice Neurology: Somatosensory cortex thickening in patients with migraine
2008 L'Hebdo (Switzerland): Autistes Hypersensibles ou indifferents aux autres?
2010 L'Hebdo (Switzerland): Forum des 100 award, Awarded to the 100 most influential persons in French-Speaking Switzerland
2010 L'Hebdo (Switzerland): "Obèses, autistes, migraineux, votre cerveau m'intéresse"
2010 Swissinfo.ch (Switzerland): Advocates want turnaround in autism treatment
2010 RSR.ch (Switzerland): Journée internationale de sensibilisation à l'autisme
2010 24Heures (Switzerland): Vous Cherchez? Nouchine Hadjikhani
2010 L'Hebdo (Switzerland): Forum des 100, Nouchine Hadjikhani: Le cerveau au scanner
2011 TSR Swiss National Television news (Switzerland): Autism Day 2011
2011 Harvard Medicine: The Chill of Fear
2011 CNN.com (July 2011): Antidepressant use in pregnancy may raise autism risk
2013 Le Temps (Switzerland): Le cerveau hyper-connecté des autistes

2013 BBC news (2013): Pareidolia: Why we see faces in hills, the Moon and toasties
2013 Dagens Nyheter (Sweden): Därfor är Hitler en tekanna
2014 National Geographic: Why Do People See Faces in the Moon
2014 Tech Times: Why Do We See Faces and Mysterious Objects On the Surfaces of Other Planets?
2014 The Huffington Post: Is This Perfect Face In The Clouds For Real?
2014 The Week: The Science of Fear
2015 Vice: The Futility of Modern Fears
2015 Spectrum News: Rare glimpse of neurons refine understanding of the amygdala
2016 Swedish TV4 News: Hennes forskning kan lösa autismens gåtor
2017 The Philadelphia Enquirer: Study: Overstimulation, not indifference, makes eye contact hard for people with autism
2017 Science Daily: Why do those with autism avoid eye contact.
2017 MedicalXpress: Researchers explore why those with autism avoid eye contact
2017 Science Alert: For Those With Autism, Eye Contact Isn't Just Weird, It's Distressing
2017 DoctorsLounge: Why People with Autism Avoid Eye Contact
2017 Sioux City Journal: Why People with Autism Avoid Eye Contact
2017 Harvard Medical School News: Ocular Overdrive
2017 The Mass General Research Institute Blog: More Than Meets the Eye: Researchers Find Eye Contact Causes Stress and Overactivation in the Brains of Autistic Individuals
2017 New York Magazine: Here is why Eye Contact Is So Awkward for Some People
2017 U.S. News & World Report: Why People With Autism Avoid Eye Contact
2017 The Huffington Post: Why Eye Contact Is So Distressing For People With Autism
2017 Massachusetts General Hospital Research Institute: Brain imaging studies provide new insights into biological basis of behaviors in schizophrenia and autism
2017 AutisMag: Can Your Child's Eye Movement Help You Visualize their Future Well-Being?
2017 Omaha Herald: Cooking up just the right scare
2018 Les Echos (France): Vers un premier traitement contre l'autisme?
2018 Tagesspiegel (Germany): Fatal Giant Waves in the head
2019 Medscape: Brain Imaging Reveals Neuroinflammation in Migraine with Aura.
2020 Express.co.uk: Autism symptoms: Study delves into why lack of eye contact is often a symptom of condition
2023 PsyPost: Eye contact avoidance in autism may stem from abnormal sensitivity of brain's threat processing system, study suggests.
2023 Special Nest: New research: Autism may be due to different activity
2024 Special Nest: Fortsatt forskining om urindrivande lakemedel som behadnling vid autism

Narrative

Nouchine Hadjikhani, MD, PhD, is Associate Professor in Radiology at Harvard Medical School, where she directs the Neurolimbic Research Laboratory, and Professor in Experimental Child and Adolescent Psychiatry at the Sahlgrenska Academy, Gothenburg University, Sweden. She is also an Assistant in Radiology at Mass General Hospital in Boston. She is an author of 145 peer-review articles, and of 16 books, book chapters and other publications. She is highly cited, with an h-index of 63 and more than 19000 citations.

In her work, she has employed neuroanatomy, histology, Positron Emission Tomography (PET), functional Magnetic Resonance Imaging (fMRI), Diffusion Tensor Imaging (DTI), electroencephalography (EEG), magnetoencephalography (MEG) as well as behavioral methods, including eye-tracking, to study the normal and the diseased brain.

Early in her career study she discovered and characterized the area of the brain that is responsible for color vision with use of fMRI. She then showed that the aura of migraine was a phenomenon similar to cortical spreading depression and has since studied the long-term effects of migraine on the brain. This was a ground-breaking paper that has been cited more than 1800 times. More recently, she showed that migraine with aura was accompanied by neuroinflammation, and that the meninges and the adjacent bone were participating in the process. In the field of

autism, she demonstrated that "low level" visual processing is normal in individuals with autism, ruling out a bottom-up deficit. She was also the first to provide data disproving a popular theory stating that individuals with autism are lacking the brain area devoted to face identification (the "fusiform face area", or FFA). Anatomical and functional studies conducted by her team have evidenced the presence of abnormalities in the so-called "mirror neuron" areas (which enable us to mimic and mentally simulate the emotions, behavior and movement of others) of young adults with high-functioning autism. She also demonstrated that affective empathy is preserved in individuals with autism. Her current work is dedicated to understanding the neural bases of ASD and other neurodevelopmental disorders, and to develop neural biomarkers that will help to objectify the effect of therapeutic approaches, both behavioral and pharmacological. In her current research she is trying to understand the roots of eye-contact difficulties in autism, and how to improve them.

For her outstanding research in the field of autism she received Niclas Öberg Life Watch Award in 2016 and The Leenaards Award in 2010.