

BIOGRAPHICAL SKETCH

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NAME: Strathearn, Lane

eRA COMMONS USER NAME (credential, e.g., agency login): strathearn

POSITION TITLE: Professor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Queensland, Medicine, Brisbane, QLD	MBBS	11/1992	Medicine (MD equivalent)
Royal Australasian College of Physicians, Paediatrics and Child Health, Sydney, NSW	OTH	11/2002	Pediatrics and Child Health (FRACP)
University of Queensland, Medicine, Brisbane, QLD	PHD	10/2009	Medicine (Topic: Maternal Neglect)
Mater Misericordiae Children's Hospital, Brisbane, Queensland	Resident	12/1998	Pediatrics, including appointment as Chief Resident
Mater Misericordiae Children's Hospital, Brisbane, QLD	Fellow	12/1999	Child Protection and Neurodevelopment
University of Queensland, Brisbane, QLD	Fellow	12/2000	Child Maltreatment Research
Baylor College of Medicine, Houston, TX	Postdoctoral Fellow	02/2004	Developmental Pediatrics

A. Personal Statement

I am a tenured professor of pediatrics at the University of Iowa and Division Director for Developmental and Behavioral Pediatrics, and hold an Endowed Chair for Pediatric Neurodevelopment. I have recently been appointed as the physician director of the Center for Disabilities and Development (CDD) at the University of Iowa Children's Hospital, which has been designated as a University Center for Excellence on Developmental Disabilities Education, Research and Service (UCEDD) since 1972. I am co-director for both the UCEDD and the LEND program (Leadership Education in Neurodevelopmental and related Disabilities), which provides long-term, graduate level interdisciplinary training and service, and has been continuously funded for over 20 years. My training as a developmental pediatrician, a child maltreatment specialist, and a neuroscientist has resulted in a broad perspective on the interactive effects of genes and environment on childhood neurodevelopment. This perspective and expertise will be utilized extensively in this research project. I have a proven track record of NIH funding, interdisciplinary collaboration, and leadership, with 2 recent R01 grants including a competitive renewal for which I am the corresponding MPI in a multi-site study. My experimental work has included epidemiological and longitudinal research of extreme prematurity and cognitive/emotional development, randomized controlled intervention trials of intranasal oxytocin in autism and parenting, and functional MRI studies exploring the neural basis of parent-infant attachment.

My research career has consistently focused on the translation of basic science to inform clinical practice. I have drawn upon animal models of infant development and parenting behavior to test novel hypotheses using functional MRI and behavioral phenotyping, then expanding to explore high-risk populations, such as prenatally substance-abusing mothers and mothers with unresolved childhood trauma or depression.

Overall, these skills and experiences will enable me to successfully contribute to this project.

B. Positions and Honors

Positions and Employment

2000 - 2000	Associate Lecturer, University of Queensland, Pediatrics and Child Health, Brisbane, QLD
2002 - 2004	Instructor, Baylor College of Medicine, Pediatrics, Houston, TX
2004 - 2007	Assistant Professor, Baylor College of Medicine, Pediatrics, Houston, TX
2006 - 2010	Research Associate, Baylor College of Medicine, Neuroscience, Houston, TX
2007 - 2014	Assistant Professor (tenure track), Baylor College of Medicine, Pediatrics, Houston, TX
2010 - 2014	Assistant Professor (joint appointment), Baylor College of Medicine, Menninger Department of Psychiatry and Behavioral Sciences, Houston, TX
2013 -	Honorary Senior Lecturer, University College London, Clinical, Educational and Health Psychology, London
2014 - 2015	Associate Professor (joint appointment), Baylor College of Medicine, Neuroscience, Houston, TX
2014 - 2015	Associate Professor, Baylor College of Medicine, Pediatrics and Psychiatry, Houston, TX
2015 -	Professor, Stead Department of Pediatrics, University of Iowa, Iowa City, IA
2015 -	Physician Director, Center for Disabilities and Development, University of Iowa Children's Hospital, Iowa City, IA
2015 -	Director, Division of Developmental and Behavioral Pediatrics, Stead Family Department of Pediatrics, University of Iowa, Iowa City, IA

Other Experience and Professional Memberships

1994 -	Member, Royal Australasian College of Physicians - Chapter of Community Child Health
2002 -	Member, Society for Neuroscience
2005 - 2007	Member, Organization for Human Brain Mapping
2005 - 2011	Ad Hoc Reviewer, NIH (NICHD) Peer Review Committee
2007 -	Ad Hoc Reviewer, CDC Peer Review Committee, "Improving Public Health Practice through Translation Research"
2008 -	Board Member, International Association for the Study of Attachment
2009 -	Selected Attendee, Workshop of Autism Spectrum Disorders, Banbury Conference Center, Cold Springs Harbor Laboratory, NY.
2010 -	Treasurer, International Association for the Study of Attachment
2011 - 2011	Invited Referee, European Research Council
2011 - 2012	Conference Program Co-Chair, International Association for the Study of Attachment
2012 -	Panel Member, Child Psychopathology and Developmental Disabilities (CPDD) Study Section, Biobehavioral and Behavioral Processes Integrated Review Group, National Institutes of Health.
2013 - 2013	Reviewer, NIMH RDoC Scientific Review Committee
2014 -	Member, Society for Developmental and Behavioral Pediatrics

Honors

1999	Chief Pediatric Resident, Mater Children's Hospital, Brisbane, Queensland, Australia
1999	United Medical Protection Conference Prize, 7th Australasian Conference on Child Abuse and Neglect
1999	Pediatric Traveling Fellowship, The Royal Australasian College of Physicians
1999	Research Award, Annual Scientific Meeting of Advanced Trainees of the Royal Australasian College of Physicians, Queensland, Australia
2000	New Investigator Award, Perinatal Society of Australia and New Zealand. Research chosen as "President's Selection"
2009	Dean's Award for Outstanding Research Higher Degree Theses for the PhD dissertation, University of Queensland

- 2010 Fulbright and Jaworski L.L.P. Faculty Excellence Award for Educational Scholarship in Development of Enduring Educational Materials, Baylor College of Medicine
- 2010 - 2015 Membership in the Academy of Distinguished Educators, Baylor College of Medicine
- 2015 William E. Bell/Gail A. McGuiness Chair for Pediatric Neurodevelopment, University of Iowa
- 2015 Invited Speaker: NIH Workshop on "Oxytocin in Intellectual and Developmental Disabilities", National Institute on Child Health and Human Development

C. Contribution to Science

1. **Cognitive and Behavioral Outcomes of Child Maltreatment.** Previous research on the etiology of intellectual and developmental disabilities has traditionally focused on genetic abnormalities or factors associated with birth trauma or prematurity. My first paper, published in *Pediatrics*, revealed that a state-reported history of child neglect in extremely low birth weight infants was associated with a progressive decline in cognitive functioning over the first 4 years of life, eclipsing the effect of many of the major medical complications of extreme prematurity. The paper also highlighted the surprisingly high rate of maltreatment among this population of at-risk infants (around 15%). Subsequent research involving 14-year follow-up of a birth cohort of up to 8500 mothers and children confirmed this finding, showing cognitive deficits in maltreated children, as well as strong associations with serious mental health problems such as early substance abuse, aggressive behavior problems, and depression.
 - a. Mills R, Alati R, Strathearn L, Najman JM. Alcohol and tobacco use among maltreated and non-maltreated adolescents in a birth cohort. *Addiction*. 2014 Apr;109(4):672-80. PubMed PMID: [24325599](#); PubMed Central PMCID: [PMC4140564](#).
 - b. Mills R, Scott J, Alati R, O'Callaghan M, Najman JM, Strathearn L. Child maltreatment and adolescent mental health problems in a large birth cohort. *Child Abuse Negl*. 2013 May;37(5):292-302. PubMed PMID: [23380430](#); PubMed Central PMCID: [PMC3918944](#).
 - c. Mills R, Alati R, O'Callaghan M, Najman JM, Williams GM, Bor W, Strathearn L. Child abuse and neglect and cognitive function at 14 years of age: findings from a birth cohort. *Pediatrics*. 2011 Jan;127(1):4-10. PubMed PMID: [21135010](#).
 - d. Strathearn L, Gray PH, O'Callaghan MJ, Wood DO. Childhood neglect and cognitive development in extremely low birth weight infants: a prospective study. *Pediatrics*. 2001 Jul;108(1):142-51. PubMed PMID: [11433067](#).

2. **Potential Role of Oxytocin in Child Neglect.** Further analysis on this longitudinal dataset revealed that breastfeeding appeared to have a surprising protective factor against childhood neglect. Conversely, mothers who did not breastfeed were almost 4 times more likely to be reported for maternally-perpetrated neglect over the next 15 years, compared with mothers who breastfed for 4 or more months. This result led to further investigation into the potential effects of oxytocin on parenting behavior and neurobiology, showing that a mother's peripheral oxytocin response is associated with differences in caregiving temperament, brain response to infant face cues, and interactive mother-infant behavior.
 - a. Kim S, Fonagy P, Koos O, Dorsett K, Strathearn L. Maternal oxytocin response predicts mother-to-infant gaze. *Brain Res*. 2014 Sep 11;1580:133-42. PubMed PMID: [24184574](#); PubMed Central PMCID: [PMC4286383](#).
 - b. Strathearn L, Iyengar U, Fonagy P, Kim S. Maternal oxytocin response during mother-infant interaction: associations with adult temperament. *Horm Behav*. 2012 Mar;61(3):429-35. PubMed PMID: [22306668](#); PubMed Central PMCID: [PMC3358225](#).
 - c. Strathearn L. Maternal neglect: oxytocin, dopamine and the neurobiology of attachment. *J Neuroendocrinol*. 2011 Nov;23(11):1054-65. PubMed PMID: [21951160](#); PubMed Central PMCID: [PMC3319675](#).
 - d. Strathearn L, Mamun AA, Najman JM, O'Callaghan MJ. Does breastfeeding protect against substantiated child abuse and neglect? A 15-year cohort study. *Pediatrics*. 2009 Feb;123(2):483-93. PubMed PMID: [19171613](#); PubMed Central PMCID: [PMC2650825](#).

3. **The Neurobiology of Attachment.** Next, I sought to better understand the biological mechanisms that underlie a secure mother-infant attachment relationship, using functional MRI and measures of adult and child attachment. In general, we showed that when mothers viewed images of their own infants smiling, key dopamine-associated reward processing regions were activated. However, this was conditional upon the mother's own childhood experience, as measured by the Adult Attachment Interview. Mothers with "insecure" attachment patterns did not show reward activation to their own infant's smiling face, but showed increased insula activation to their infant's crying face, suggesting feelings of pain or disgust. Mothers with insecure attachment also showed behavioral differences when interacting with their infant, and those infants were far more likely to develop insecure attachment patterns at 14 months of age, based on the Strange Situation Procedure.
- Kim S, Fonagy P, Allen J, Martinez S, Iyengar U, Strathearn L. Mothers who are securely attached in pregnancy show more attuned infant mirroring 7 months postpartum. *Infant Behav Dev.* 2014 Nov;37(4):491-504. PubMed PMID: [25020112](#); PubMed Central PMCID: [PMC4301602](#).
 - Shah PE, Fonagy P, Strathearn L. Is attachment transmitted across generations? The plot thickens. *Clin Child Psychol Psychiatry.* 2010 Jul;15(3):329-45. PubMed PMID: [20603421](#); PubMed Central PMCID: [PMC3060612](#).
 - Strathearn L, Fonagy P, Amico J, Montague PR. Adult attachment predicts maternal brain and oxytocin response to infant cues. *Neuropsychopharmacology.* 2009 Dec;34(13):2655-66. PubMed PMID: [19710635](#); PubMed Central PMCID: [PMC3041266](#).
 - Strathearn L, Li J, Fonagy P, Montague PR. What's in a smile? Maternal brain responses to infant facial cues. *Pediatrics.* 2008 Jul;122(1):40-51. PubMed PMID: [18595985](#); PubMed Central PMCID: [PMC2597649](#).
4. **Parental Brain Responses and Psychopathology.** Our most recent work has focused on high risk parenting conditions, such as maternal depression, addiction and unresolved childhood trauma, showing variations in maternal brain response to reward and infant face cues in affected mothers. Unresolved trauma, for example, is associated with a blunted amygdala response to infant distress cues, as well as the development of insecure attachment in the offspring. We hypothesize that mothers with drug addiction problems, a majority of whom have unresolved trauma, will show a dampened brain reward response to "natural" reward cues, such as their infant's smiling face, which is reversed by intranasal oxytocin. Understanding the neurobiological mechanisms which underlie typical and pathological parenting may lead to early intervention which help prevent or ameliorate childhood cognitive and emotional dysfunction.
- Kim S, Kwok S, Mayes LC, Potenza MN, Rutherford HJ, Strathearn L. Early adverse experience and substance addiction: dopamine, oxytocin, and glucocorticoid pathways. *Ann N Y Acad Sci.* 2016 Aug 10;PubMed PMID: [27508337](#); PubMed Central PMCID: [PMC5303188](#).
 - Sharp C, Kim S, Herman L, Pane H, Reuter T, Strathearn L. Major depression in mothers predicts reduced ventral striatum activation in adolescent female offspring with and without depression. *J Abnorm Psychol.* 2014 May;123(2):298-309. PubMed PMID: [24886004](#).
 - Kim S, Fonagy P, Allen J, Strathearn L. Mothers' unresolved trauma blunts amygdala response to infant distress. *Soc Neurosci.* 2014;9(4):352-63. PubMed PMID: [24635646](#); PubMed Central PMCID: [PMC4260525](#).
 - Iyengar U, Kim S, Martinez S, Fonagy P, Strathearn L. Unresolved trauma in mothers: intergenerational effects and the role of reorganization. *Front Psychol.* 2014 Sep 1;5:966. PubMed PMID: [25225490](#); PubMed Central PMCID: [PMC4150444](#).

Complete List of Published Work in My Bibliography:
<http://bit.ly/1TAti5V>

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

R01 DA026437-07

Strathearn, Lane (MPI)

04/01/09-01/31/21

Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers

Role: PI

R03 HD080998-02

Strathearn, Lane (PI)

04/01/15-03/31/18 (NCE)

Paternal Brain Responses to Infant Face Cues: Effects of Intranasal Oxytocin

Role: PI

Completed Research Support

R01 HD065819-05

Strathearn, Lane (PI)

07/15/10-05/31/16

Intranasal Oxytocin: A Neuropharmacological Intervention for Maternal Neglect?

Role: PI

R01 DA026437-05S1

Strathearn, Lane (PI)

04/15/10-04/14/15

Maternal Brain and Behavioral Responses to Infant Cues in Cocaine Exposed Mothers

Role: PI

R01 DA026437-05

Strathearn, Lane (PI)

04/15/10-04/14/15

Maternal Brain and Behavioral Responses to Infant Cues in Cocaine Exposed Mothers

Role: PI

R01 DA026437-04S1

Strathearn, Lane (PI)

04/15/10-01/31/15

Maternal Brain and Behavioral Responses to Infant Cues in Cocaine Exposed Mothers

Role: PI

K23 HD043097-05

Strathearn, Lane (PI)

01/01/04-12/31/08

A Functional MRI Study of Mother-Infant Attachment

Role: PI