Trainee Expansion Programme

AWARDEES 2016

We are pleased to present the awardees of the TEP Bridge Funds and the TEP Travel Funds, who each received up to USD 100,000 or up to USD 10,000 respectively to advance in their academic career.

ALECIA-JANE TWIGGGER
Mini mammary gland culture
TBF Awardee 2016

KIMBERLY LACKEY
M. leprae in human milk
TTF Awardee 2016

KLARA STRYDOM
HMO in human milk of HIV+ mothers
TTF Awardee 2016

MELANIE WANGE LARSSON
Appetite hormones in human milk
TTF Awardee 2016
Extracting cells from milk provides direct access to live viable cells from the lactating mammary gland that can be compared to established characteristics and regenerative capabilities of mammary cells of non-pregnant, non-lactating women. Sorting and comparing gene expression and protein signatures of mammary cells obtained from breast mammoplasties and milk cells will elucidate differences in mammary cell function during the resting and highly plastic periods of normal development. This project brings together expertise in human milk cells and state-of-the art organoid culturing techniques to develop an in vitro model of human lactation that will revolutionise our understanding of the molecular characteristics of mammary cell development and function.

**Alecia-Jane Twigger** is a biomedical scientist working in the field of human lactation for the past four and a half years as a part of the Human Lactation Research Group at the University of Western Australia. After completing her Bachelor of Science with Honours, she pursued a PhD examining the characteristics of the lactating mammary gland using cells isolated from human milk. Recently, Alecia-Jane has submitted her PhD thesis and plans on moving abroad to enrich her experience in mammary gland biology and develop new techniques to examine the lactating breast.
In 2014, 80,544 women were newly diagnosed with leprosy, a bacterial infection caused by Mycobacterium leprae. To date, the mechanism(s) of transmission for leprosy is (are) still not understood, but we hypothesize that one potential mechanism could be during infancy via breastmilk. To test this hypothesis, I will travel to Nepal, a leprosy-endemic country, to collect milk samples \((n = 5)\) from lactating women with leprosy as well as healthy controls. In Nepal, I will also analyze these samples using an rtPCR assay that I developed for \(M. leprae\) in breastmilk. This project will serve as proof-of-concept that the leprosy bacterium is or is not present in human milk. We will then use this information as a starting point for more targeted investigations into breastfeeding’s potential role in leprosy transmission, or will provide concrete evidence that breastmilk is safe and still best for babies born to leprosy-affected mothers.

Kimberly Lackey is a PhD candidate in Biology at Washington State University under Dr. Shelley McGuire. Originally from Portland, OR, she also completed her BA and BS at Washington State. Her doctoral research focuses on methods to collect and preserve human milk samples collected in rural field conditions, as well as the subsequent analysis of these samples for both the overall microbial community structure and for \(M. leprae\), the causative agent of leprosy. Her work and PhD will culminate in a proof-of-concept project to determine if \(M. leprae\) is present in the milk of women with leprosy. Kimberly is especially interested in women’s health and infectious disease, and would like to pursue a career in public health after completion of her PhD.
HIV-exposed uninfected infants seem to have poorer growth and greater early mortality and morbidity rates than their HIV-unexposed counterparts. Human breast milk composition is very diverse and distinct and there is an array of factors that can have an effect on the concentration of human milk oligosaccharides (HMOs). Once ingested, HMOs prevent infections, stimulate beneficial bacterial growth promoting the gut microbiome and they have an anti-inflammatory effect. It has been hypothesized that the differences in breast milk HMO composition are related to the infant’s growth and body composition. HMOs have the ability to regulate the gut flora, improve gastrointestinal activities and influence the inflammatory processes, thus being directly proportional to the growth and body composition of the infant. However, there is a distinctive gap in literature whether HMO variety and uniformity are associated with the infant gut microbiome variety and uniformity and whether they are directly proportional to early infant growth and body composition, especially in the context of HIV.

**Klara Strydom** is a dynamic dietitian with a high standing academic record. Klara obtained her BSc Dietetics Degree in 2014 whereafter she was involved as a research assistant in a large cohort study. She is currently studying towards a Master’s degree in Nutrition at the University of Stellenbosch, South Africa. The title of her thesis is “Body composition, Growth and nutritional intake of HIV exposed preterm, very and extremely-low birth weight infants in Tygerberg hospital, Western Cape.” Her research assesses the effect of HIV-exposure on human milk oligosaccharides in mothers as well as body composition and gut microbiome in preterm infants living in a resource poor setting. Klara is looking forward to working alongside experts in her field of study at the Bode Laboratory during November 2016. Klara enjoys yoga, hiking and traveling and currently resides in the beautiful city of Cape Town, South Africa.
Early high weight gain is a risk factor for later obesity. For the SKOT III study factors such as milk volume, appetite hormones and growth factors in milk and plasma, feeding pattern, eating behavior, and body composition are measured. The Travel Trainee Award allows Melanie Wange Larsson to visit the Hartmann Human Lactation Research Group (HHLRG) at University of Western Australia and gives her a unique opportunity to gain more experience in the field of research in human milk and lactation. Several of HHLRG’s research areas are very relevant for the PhD project of Melanie Wange Larsson. A key area of her PhD study is appetite hormones in human milk, a research area which HHLRG have great experience and expert knowledge in. During the stay at the HHLRG Melanie analyze human milk from her study in Denmark. In addition, Melanie Wange Larsson will also have the opportunity to observe the ongoing research at the HHLRG and learn about 24 hour milk profiles.

Melanie Wange Larsson holds a Master degree in Human Nutrition from Copenhagen University and is an associate professor at the Institute of Nutrition and Midwifery, Metropolitan University College, Copenhagen, teaching nutrition and physiology including infant and child nutrition, growth and physiology of breastfeeding. Since 2014 Melanie has also been working on her Ph.D. at Copenhagen University.

The overall objective of Melanie’s PhD study is to examine exclusively breastfed infants with very high weight gain in the first months of life to have a better understanding of causes for the weight gain and consequences for these infants. The team has established a cohort (SKOT III) of exclusive breastfed infants with excessive weight gain (weight-for-age z-score ≥2.00 SD) during the first months of life. Factors as appetite hormones in milk and infant blood, milk volume, feeding pattern, baby eating behavior and body composition will be investigated.