



# Joint Japan-New Zealand DOHaD Researchers Seminar

2 – 3 February 2016  
Auckland, New Zealand



LIGGINS  
INSTITUTE



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**Additional Information**

***Funding Opportunities for DOHaD Research Collaboration  
Maps***

**PROGRAM FOR  
NEW ZEALAND-JAPAN JOINT DOHaD SEMINAR  
2 – 3 FEBRUARY 2016**

*supported by The Japan Society for the Promotion of Science (JSPS)*

**DAY 1: TUESDAY 2 FEBRUARY**

*Moderators: Frank Bloomfield (NZ) and Hiroaki Itoh (Japan)*

**08.15am**

Participants arrive, tea and coffee provided

**08:30 – 8:40**

*Peter Gluckman, Frank Bloomfield, Hiroaki Itoh and Masahito Oyamada*

Greet the Consul-General of Japan in Auckland, Mr Yoshitaka Yokoyama and his attaché, Mr Kensuke Hayashi

**08:40 – 09:00**

Welcome: Frank Bloomfield

Remarks: Yoshihiro Ogawa

**Address: Consul-General of Japan in Auckland, Mr Yoshitaka Yokoyama**  
*(9am Consul-General departs)*

**09:00 – 10:30**

**Session 1: DOHaD epigenetics**

*Chairs – Sir Peter Gluckman (NZ) and Yoshihiro Ogawa (Japan)*

*15 minutes per speaker; 30 minute panel discussion*

- 1) Takeo Kubota (Japan)
- 2) Allan Sheppard (NZ)
- 3) Kenichiro Hata (Japan)
- 4) Peter Dearden (NZ)

**10:30 – 11:00 Morning tea and tour of the Liggins Institute Lab facilities**

*Frank Bloomfield, Eric Thorstensen & Mark Vickers*

**11:00 - 12:30**

**Session 2: DOHaD mechanisms – evidence from animal models and potential for interventions**

*Chairs – Peter Dearden (NZ) and Takeo Kubota (Japan)*

*15 minutes per speaker; 30 minute panel discussion*

- 1) Koshi Hashimoto (Japan)
- 2) Mark Vickers (NZ)
- 3) Hiroaki Itoh (Japan)
- 4) Anne Jaquiere (NZ)

**12:30 - 13:30 Lunch Break**

**13:30 – 15:00**

**Keynote Address: DOHaD: Setting the Scene**

*Lectures – 45 minutes per speaker*

DOHaD: Past, Present and Future

Sir Peter Gluckman (NZ)

**15:00 – 15:30 Tea Break and tour of the Liggins Institute Education Intervention facilities**

*Frank Bloomfield, Chandar Dewan and Jacquie Bay*

**15:30 – 16:30**

**Session 3: DOHaD – Public Health Implications**

*Chairs – Sir Peter Gluckman (NZ) and Yoshihiro Ogawa (Japan)*

*15 minutes per speaker; 30 minute panel discussion*

- 1) Susan Morton (NZ)
- 2) Kohta Suzuki (Japan)

**16:30 – 16:45**

**Session 4: Group discussion; identification of emerging collaboration opportunities**

*Presentation on potential funding opportunities - appointments, exchanges, student appointments*

F Bloomfield, D Cameron-Smith and M Vickers (NZ)

Hiroaki Itoh (Japan)

**16:45 - 17:30**

**Group A: Collaboration in human cohort study, intervention and education**

*Moderators: Peter Gluckman (NZ) and Masahito Oyamada (Japan)*

**NZ:** Jacquie Bay, Susan Morton, Anne Jaquiere, Clare Wall, Blakely Brown, Tim Kenealy, Chong Yap Seng, Anecita Lim

**Japan:** Hidemi Takimoto, Fumihito Sata, Kohta Suzuki, Yuya Nakano, Daishi Hirano, Naoko Arata, Tomoko Aoyama

**Group B: Collaboration in biological mechanism**

*Moderators: Frank Bloomfield (NZ) and Takeo Kubota (Japan)*

**NZ:** David Cameron-Smith, Mark Vickers, Peter Dearden, Justin O'Sullivan, Allan Sheppard, Tony Pleasants, Clare Reynolds, Wayne Cutfield, Ben Albert

**Japan:** Yoshihiro Ogawa, Koshi Hashimoto, Kenichiro Hata, Hideoki Fukuoka, Hiroaki Itoh

**17.30 DAY 1 CONCLUDES**

**19.30 – 22:00 DINNER: Safran Restaurant, Newmarket**

## **DAY 2: WEDNESDAY 3 FEBRUARY**

*Moderators: Frank Bloomfield (NZ) and Hiroaki Itoh (Japan)*

**08:30 – 10:00**

### **Session 5: DOHaD cohort studies**

*Chairs – Wayne Cutfield (NZ) and Hideoki Fukuoka (Japan)*

*15 minutes per speaker; 15 minute panel discussion*

- 1) Fumihiko Sata (Japan)
- 2) Susan Morton – Growing Up in New Zealand
- 3) Kohta Suzuki (Japan)
- 4) Tim Kenealy – NIPPER
- 5) Chong Yap Seng – GUSTO, Singapore

**10:00 – 10:30 Morning tea and tour of the Liggins Institute Clinical Research Unit**

*Frank Bloomfield and Wayne Cutfield*

**10:30 - 11:30**

### **Session 6: Nutrition: Population patterns and cultural perspectives**

*Chair – Blakely Brown (US)*

*15 minutes per speaker; 15 minute panel discussion*

- 1) Clare Wall (NZ)
- 2) Hidemi Takimoto (Japan)
- 3) Chong Yap Seng (Singapore)

**11:30 – 12:30**

### **Session 7: DOHaD Interventions: Opportunities during adolescence and the periconception period**

*Chairs – Susan Morton (NZ) and Masahito Oyamada (Japan)*

*15 minutes per speaker; 15 minute panel discussion*

- 1) Jacquie Bay (NZ)
- 2) Masahito Oyamada (Japan) and Anecita Lim (NZ)
- 3) Blakely Brown (US)

**12:15 - 13:00 Lunch Break**

**13:00 – 14:00**

### **Session 8: DOHaD Interventions: Opportunities during pregnancy and early-life**

*Chairs – Peter Dearden (NZ) and Hiroaki Itoh (Japan)*

*15 minutes per speaker; 15 minute panel discussion*

- 1) Anne Jaquiere (NZ)
- 2) Hidemi Takimoto (Japan)
- 3) Wayne Cutfield (NZ)

**14:00 – 15:30**

### **Session 9: DOHaD: Hot Topics**

*Chairs – Wayne Cutfield (NZ) and Kenichiro Hata (Japan)*

*15 minutes per speaker; 15 minute panel discussion*

- 1) Frank Bloomfield (NZ) Nutrition in the neonate
- 2) Naoko Arata (Japan) GDM in Japan
- 3) Tomoko Aoyama (Japan) Physical Activity in DOHaD
- 4) Justin O'Sullivan (NZ) The gut microbiome

**15:00 – 15:30 Tea Break**

**15:30 – 16:30**

**Session 10: Emerging DOHaD researchers**

*Chairs – Mark Vickers (NZ) and Koshi Hashimoto (Japan)*

*15 minutes per speaker; 15 minute panel discussion*

- 1) Daishi Hirano (Japan)
- 2) Clare Reynolds (NZ)
- 3) Yuya Nakano (Japan)
- 4) Ben Albert (NZ)

**16:30 – 17:30**

**Discussion session – opportunities emerging**

*Chairs –Frank Bloomfield (NZ) and Hideoki Fukuoka (Japan)*

- 1) How to standardize the protocols of on-going cohorts in NZ and Japan
- 2) How to promote collaborations between two countries in the annual meeting of DOHaD-Japan
- 3) Opportunities to study in Liggins Institute for Japanese young DOHaD researchers
- 4) Others

**Closing Remarks:**

Frank Bloomfield (NZ)

Yoshihiro Ogawa (Japan)

**17.45 DAY 2 CONCLUDES**

**19:30 – 22:00 DINNER: Banque Restaurant, Remuera**

## **EPIGENOMIC-BASIS OF PREEMPTIVE MEDICINE FOR NEURODEVELOPMENTAL DISORDERS**

***Professor Takeo Kubota***

*Department of Epigenetic Medicine*

*University of Yamanashi, Chuo, Japan*

Neurodevelopmental disorders (NDs) are currently thought to be caused by either congenital genetic defects or environmental factors. Recent studies have demonstrated that congenital NDs can result not only from changes in DNA sequence but also from changes to the epigenomic modifications of DNA and histone proteins. Thus, epigenomic assays are currently performed for diagnosis of the congenital NDs. It is recently known that the epigenomic modifications can be altered by various environmental factors, which potentially cause acquired NDs. Furthermore these alterations can potentially be restored taking advantage of use of reversibility in epigenomics. In this session, I would like to show examples of environmental factor-induced epigenomic changes and drug-induced epigenetic effects, and propose epigenomic-based preemptive medicine for acquired NDs based on our experience of early epigenomic testing and the subsequent intervention that prevented patients with Prader-Willi syndrome, a congenital ND, from having adulthood complications such as obesity and diabetes mellitus.

### **Proposal for research collaboration**

I would like to have collaboration with the researchers who are searching epigenomic signatures that are introduced by environmental factors during fetal and early period of life, which can be predictor of occurrence of adult-onset diseases and indicator of high risk of adult-onset diseases.

## CAUSALITY IN BIOLOGICAL PHENOTYPES FROM A COMPLEX SYSTEMS PERSPECTIVE

***Dr Allan Sheppard***

*Developmental Epigenetics, Nutrition*

*Liggins Institute, The University of Auckland, New Zealand*

The variety of biological phenotypes we observe in a population can be viewed as an ‘emergent property’ arising from the interplay of what ‘complex systems theory’ describes as “regulatory modes” of action. In the biological context these are most often defined in terms of a temporal profile of a set of expressed genes. Yet, a static measure at one time point, and of one biological feature (eg a single –omic data set), cannot sufficiently capture the complexity of the “intramolecular correlations” and the environmental stability of the features through time. As a consequence we often fail to identify the truly relevant biological variables which are critically determinant of a particular phenotype outcome and its expressed variance within the population. To rise to this challenge we are combining and applying principles of non-linear dynamics with traditional –omic based measures, with the key objective of establishing which regulatory gene interactions display a pivotal ‘causal arrow’ in driving a given phenotype variance. The concepts and questions encompassed by the DOHaD paradigm lend themselves particularly to this perspective as the phenotype outcomes emerge through a considerable temporal interval, and because we are able to potentially measure events at multiple time points in the trajectory. In collaboration with mathematical modellers we are then able to interrogate the strength of interactions between molecular measures and phenotype outcomes through the time course.

### **Proposal for research collaboration**

Epigenetic indicators have proven to be of particular interest in this regard as biological variance in features such as DNA methylation are dynamic in development and a product of both inherited and environmental cues during critical windows of the early life history.



# INADEQUATE MATERNAL GESTATIONAL WEIGHT GAIN INCREASED EPIGENETIC ALTERATIONS AT THE PROMOTERS OF TRANSCRIPTIONAL REGULATORS IN PLACENTA

***Dr Kenichiro Hata***

*Department of Maternal-Fetal Biology*

*National Research Institute for Child Health and Development, Tokyo*

Foetal environmental factors, including maternal nutrition, hormonal disturbance, and chemical exposure, affect foetal growth and are thought to serve as epigenetic memories. We analyzed genome-wide DNA methylation profiles for 33 postpartum placentas from pregnancies of normal and SGA cases with various extents of maternal gestational weight gain. Epigenetic alterations accumulate in the placenta under adverse *in utero* environments, as shown by application of Smirnov-Grubbs' outlier test. Moreover, hypermethylation occurs frequently at the promoter regions of transcriptional regulator genes, including polycomb targets and zinc-finger genes, as shown by annotations of the genomic and functional features of loci with altered DNA methylation. Aberrant epigenetic modifications at such developmental regulator loci, if occurring in foetuses as well, will elevate the risk of developing various diseases, including metabolic and mental disorders, later in life.

## **Proposal for research collaboration**

Epigenomics of human diseases and animal models.

## INSECT MODELS OF DOHaD PHENOMENA

**Professor Peter K Dearden**

*Biochemistry Department, School of Medical Sciences*

*University of Otago, Dunedin, New Zealand*

Understanding the biology and epigenetics behind DOHaD phenomena is vitally important if we are to ameliorate their effects. The complexity of interactions between organisms and their environment make this difficult to achieve. Insect models can provide insights into DOHaD processes as insects share many of the genes in the human genome and have similar mechanisms of gene regulation. Most importantly it is relatively easy to manipulate both genetics and environment in insect models systems allowing us to generate hypotheses and test them effectively.

We have used insect models to investigate a number of biological processes of importance to DOHaD, including mechanisms of developmental and adult plasticity, the inheritance of acquired characteristics and the implications of transgenerational inheritance. Most importantly we have begun to translate findings and hypotheses from these studies into human biology.

### **Proposal for research collaboration**

We can provide expertise in animal developmental genetics and epigenetics, and model systems in which to test key ideas in the DOHaD field.

## **EFFICACY OF EARLY LIFE INTERVENTIONS IN REVERSING ADVERSE METABOLIC AND CARDIOVASCULAR PROGRAMMING IN OFFSPRING: STUDIES IN THE RAT**

***Associate Professor Mark Vickers***

*Developmental Programming, Nutrition*

*Liggins Institute, The University of Auckland, New Zealand*

Obesity and related non-communicable diseases (NCDs) are major public health issues in both developed nations and those developing economies undergoing nutrition transitions. Both ends of the maternal nutrition spectrum can elicit similar adverse phenotypic outcomes in offspring with both maternal undernutrition and maternal obesity giving rise to increased adiposity and metabolic and cardiovascular disorders in offspring. It has now been shown that, at least in pre-clinical models, early life programming of postnatal metabolic disorders is potentially reversible by nutritional or targeted therapeutic interventions during critical periods of development. These include maternal supplementation with methyl donors, lipids and the sulfonic acid taurine and neonatal paradigms utilising leptin and growth hormone treatment. However, although these intervention approaches provide great promise, it may not be a “one-size” fits all approach. We have shown for example that the efficacy of early life treatment interventions on gene expression and epigenetic status in offspring in later life is *directionally dependent* on the mother’s nutritional status and the *in utero* environment. Translation of the preclinical findings to the clinical setting has the potential to have a major impact on reduction of obesity and NCD risk and provides an exciting opportunity for effective and lasting approaches to disease prevention rather than treating the disease once manifest.

### **Proposal for research collaboration**

- 1) Utilising small animal models to understand the mechanistic basis for adverse metabolic programming and potential intervention strategies – this covers models of both maternal undernutrition and maternal obesogenic environments
- 2) Translating of pre-clinical intervention approaches to clinic

## **UNDERNOURISHMENT *IN UTERO* PRIMES HEPATIC STEATOSIS IN ADULT MICE OFFSPRING ON AN OBESOGENIC DIET; INVOLVEMENT OF ENDOPLASMIC RETICULUM (ER) STRESS**

***Professor Hiroaki Itoh***

*Department of Obstetrics and Gynecology*

*Hamamatsu University School of Medicine, Hamamatsu, Japan*

We employed a fetal undernourishment mouse model by maternal caloric restriction in three cohorts; assessment of hepatic steatosis and the ER stress response at 9 wks before a high fat diet (HFD) (cohort 1), after HFD at 17 wks (cohort 2), at 22 wks on a HFD after the alleviation of ER stress with a chemical chaperone, tauroursodeoxycholic acid (TUDCA), from 17 wks to 22 wks (cohort 3). Undernourishment *in utero* significantly deteriorated hepatic steatosis and led to the significant integration of the ER stress response on a HFD at 17 wks. The alleviation of ER stress by the TUDCA treatment significantly improved the hepatic steatosis in pups with undernourishment *in utero*, but not in those with normal nourishment *in utero* at 22 wks. These results suggest a promising future intervention by ER stress alleviation targeting the developmental origins of hepatic steatosis in association with undernourishment *in utero*.

### **Proposal for research collaboration**

Field study of health and dietary habits, especially concerning foods including natural chaperones such as brown rice and/or peels of citrus fruits.

## **DESIGNING LARGE ANIMAL EXPERIMENTS TO STUDY THE LONG TERM EFFECTS OF PRETERM BIRTH**

***Dr Anne Jaquiery***

*Liggins Institute, The University of Auckland, New Zealand*

Neonatal medicine is a relatively new specialty. To date, management strategies have largely focussed on improving survival and short term outcomes for babies born preterm. These have been successful in that survival rates have increased considerably over the last 3-4 decades. However, long term health outcomes are not equal to those of babies born at term, including higher rates of cardiovascular disease in the ex-preterm population. We have designed experiments in preterm lambs to try to identify factors that contribute to later cardiovascular disease. We have studied the separate and combined effects of preterm birth and anaemia on myocardial development in the neonatal period and cardiac function in adulthood. The results will inform clinical studies aimed at improving both short and long term outcomes after preterm birth.

## EARLY INTERVENTIONS

### ***Associate Professor Susan Morton***

*Director, Growing Up in New Zealand and Centre for Longitudinal Research*

*The University of Auckland, New Zealand*

Recognition of the importance of DOHaD for health and wellbeing at a population level in New Zealand has been slow. Recently however optimising the health of all mothers and children from before conception has become a priority. Rapid increases in childhood obesity globally with its multitude of downstream effects has been a key driver of this shift. In NZ over 1 in 3 children are now overweight (11%) or obese (24%). Maori and Pacific children are 2-3 times more likely to be obese than NZ European children. These early ethnic differences will likely further exacerbate the adult inequalities in NCD outcomes in the future. Intervening to reduce childhood obesity and its downstream effects is an urgent problem with evidence suggesting interventions in early life are likely most cost-effective. Key challenges to be explored in the NZ population include how to target interventions to the most vulnerable children to optimize population wellbeing.

## LONGITUDINAL ANALYSES OF CHILDHOOD GROWTH: EVIDENCE FROM PUBLIC HEALTH ACTIVITY

***Associate Professor Kohta Suzuki***

*Department of Health Sciences, University of Yamanashi, Japan*

Based on the DOHaD hypothesis, childhood growth trajectories, which are described by multilevel analysis, might be important in examining the effects of early-life environment. We examined the association between maternal smoking during pregnancy and fetal/childhood growth, by using the dataset from a public health activity. Children born from smoking mothers were likely to have lower birth weights and, thereafter, to show an increase in body mass index. Then, differences in pubertal growth patterns by gender and childhood weight status were examined. Growth rate and height gain trajectories were similar between genders, although pubertal growth spurts were observed earlier in girls than in boys. The overweight/obese children grew faster than did the non-overweight children in the early pubertal stages, and the non-overweight children caught up and showed greater height gains at a later stage. Based on these results, leaflets to improve maternal and childhood lifestyles have been published.

### **Proposal for research collaboration**

Regarding the association between maternal smoking during pregnancy and fetal/childhood growth, racial and environmental difference could be compared by using population-based data between New Zealand and Japan.

## **DOHaD COHORT STUDIES IN JAPAN: CURRENT STATUS AND PERSPECTIVE**

***Dr Fumihiko Sata***

*Department of Molecular Epidemiology, Medical Research Institute*

*Tokyo Medical and Dental University, Tokyo, Japan*

Japan has the highest proportion of low birth weight infants among OECD countries over 20 years. In 2011, the proportion of low birth weight in Japan was 9.6%, whereas the mean proportion of OECD countries was only 6.8%. In particular, in Japan, it has been pointed out to be in the background is young Japanese women's strong desire for being thin. Actually, the frequencies of unhealthy thinness of Japanese female junior high school third grade and high school third grade students have reached about 20%.

Birth cohort studies are believed to be suitable for epidemiological studies to demonstrate the DOHaD theory. These studies and their collaborations are very popular in European countries, whereas those are lagged behind in Japan. However, there are numbers of birth cohort studies in Japan such as the Hokkaido Study on Environment and Children's Health, Japan Environment and Children's Study (JECS), and so on. In Japan, "Healthy Parents and Children 21" was launched in 2001 to promote a variety of approaches to improve health standards of mothers and children. Recently, a new paradigm "preemptive medicine" has been proposed in Japan. The importance of interdisciplinary studies focused on fetal and childhood periods was also recommended as a political strategy.

I will introduce the Hokkaido Study on Environment and Children's Health, together with several other birth cohort studies in Japan, and focus on their current status and perspective.

### **Proposal for research collaboration**

Networks of birth cohort studies between New Zealand and Japan for research collaboration of data harmonization and analyses, seminars and training for researchers.



## **THE *GROWING UP IN NEW ZEALAND* COHORT STUDY**

***Associate Professor Susan Morton***

*Director, Growing Up in New Zealand and Centre for Longitudinal Research*

*The University of Auckland, New Zealand*

*Growing Up in New Zealand* is the country's largest longitudinal study to date, following the lives of nearly 7000 children born in 2009 and 2010. The children and their families represent the ethnic and socioeconomic diversity of contemporary NZ pre-schoolers.

The multi-disciplinary cohort study has been designed to understand what shapes developmental trajectories of children growing up in New Zealand in the 21<sup>st</sup> century. From the outset, the team have engaged with policy stakeholders to collect and provide evidence that can inform policy to ensure all New Zealand children have the best start in life. The longitudinal information now collected from the children and their families from pregnancy to school entry represents a rich and valuable resource that is available for collaborative research projects. These opportunities to engage with the resource will be described.

## INTRODUCTION OF NATIONWIDE COHORT STUDIES IN JAPAN

***Associate Professor Kohta Suzuki***

*Department of Health Sciences, University of Yamanashi, Japan*

There are two nationwide cohort studies in Japan. One of these is “Longitudinal Survey of Newborns in the 21st Century” which is carried out by Ministry of Health, Labour and Welfare. This survey has two cohorts. The first cohort consists of children born in 2001. The second one consists of children born in 2010. Basic information of the participants was obtained by vital statistics. Moreover, the annual questionnaire survey which corrects the information about lifestyle and health status including childhood anthropometrical data is carried out. The other is “Japanese Environment and Children’s Study” which is conducted by Ministry of Environment. This is a nationwide birth cohort study involving 100,000 parent-child pairs, was launched in 2011 in order to evaluate the impact of various environmental factors on children's health and development. I will talk about the detail of these cohort studies and introduce some results from these.

### **Proposal of research collaboration**

Although these are huge nationwide cohort studies, I am getting involved in some local cohort studies which are both community and hospital based. If there are some studies which have same purpose in New Zealand, it might be possible to examine the confounding and/or interaction effect of racial and environmental differences on childhood health.

## THE NIPPER AND NZ DIABETES COHORT STUDIES

### **Associate Professor Timothy Kenealy**

*Integrated Care, South Auckland Medical School*

*The University of Auckland, New Zealand*

NiPPeR (**N**utritional **I**ntervention **P**reconception and during **P**regnancy to maintain healthy glucos**E** metabolism and offsp**R**ing health) is a randomised controlled trial, recruiting pre-pregnancy, testing a nutritional intervention.

The primary endpoint is maternal glucose levels at 28 weeks pregnant. Multiple secondary endpoints include maternal and infant wellbeing, metabolic and adiposity measures. A large biobank will allow investigations to continue. There are plans to extend the study into a longer term cohort focussed on metabolism, growth and development of offspring.

NZ Diabetes Cohort Study. We collected data on 70,000 people with type 2 diabetes, followed forward through anonymous data linkage and produced predictive risk equations for CVD, renal disease, amputations, mortality.

### **Proposal for research collaboration**

Opportunities could arise from access to the NiPPeR biobank. New data linkage cohort studies can include census, social services, tax records, border control and more.

## DIET AND LIFESTYLE BEFORE AND DURING PREGNANCY

***Associate Professor Clare Wall***

*Department of Nutrition, Faculty of Medical & Health Sciences*

*The University of Auckland, New Zealand*

Women's diet and lifestyle before and during pregnancy can positively or negatively influence the health of both mother and child. Utilising maternal dietary data collected from the 'Growing Up in New Zealand' cohort study, we have demonstrated poor adherence to the National Food and Nutrition Guidelines for Healthy Pregnant Women. We have also examined the dietary patterns of these women and investigated associations between these patterns and their socio-demographic, health and lifestyle characteristics, including ethnicity. Our analysis identified two more-healthy dietary patterns and two less-healthy dietary patterns and showed differences in associations by ethnicity, place of birth and a range of socio-demographic factors, and to the degree of adherence to the current guidelines. A greater understanding of the influence of migration and ethnicity on dietary patterns in association with other socio-demographic factors could allow for more targeted strategies to support good nutrition during pregnancy.

## CURRENT PROBLEMS REGARDING NUTRITIONAL STATUS OF REPRODUCTIVE AGE WOMEN IN JAPAN

***Dr Hidemi Takimoto***

*Department of Nutritional Epidemiology*

*National Institute of Biomedical Innovation, Health and Nutrition, Tokyo, Japan*

In Japan, we face the decline in the number of births and the increase in maternal age at first birth. Also, mean birthweight has steadily declined since the mid-1970s, and the proportion of low birthweight infants has increased collaterally, reaching a plateau of nearly 10% since 2005. This value is higher than that of 1950s, when Japan was still recovering from the devastation of the World War 2. The reason behind this increase is partly attributed to the development of perinatal medicine, which assists the decision in operative deliveries leading to shorter gestational length. Another possibility is the long observed trend in the increase in underweight young women, which may be the underlying cause of maternal undernutrition. I will discuss the background regarding these problems, mainly by using data from National Health and Nutrition Survey, Japan.

### **Proposal for research collaboration**

Investigating the association between maternal dietary intakes, blood biomarkers and infant health outcomes, including epigenetic changes

## **REALISING THE POTENTIAL OF ADOLESCENCE TO PREVENT TRANSGENERATIONAL CONDITIONING OF NONCOMMUNICABLE DISEASE RISK**

***Mrs Jacquie Bay***

*Director LENScience*

*Liggins Institute, The University of Auckland, New Zealand*

Health prior to conception, and nutritional environments in the periconceptual period, contribute to programming/conditioning of later-life health and disease. Adolescence is a determining point for health-behaviors that persist into adulthood. Consequently, even when pregnancy is a considerable distance from adolescence, behaviors that develop during adolescence influence periconceptual environmental exposures and health prior to conception, contributing towards later-life NCD vulnerability in offspring. Thus adolescence is a life-stage offering significant potential for transgenerational primary prevention of obesity and NCD risk.

The Healthy Start to Life Education for Adolescents Project has developed school-based interventions, shown to empower adolescents as agents of sustained health-promoting behaviors in their families. Based on principles of multi-sectoral partnership, programs link equally to health and educational goals, validating sustained inclusion in schools. Socio-cultural contextualization is an essential component of such programs, which to date we have established in New Zealand, Tonga, the Cook Islands and the United Kingdom.

### **Proposal for research collaboration**

- 1) Investigation of efficacy of culturally adapted context-embedded education interventions to facilitate communication and translation of DOHaD evidence in school-based settings.
- 2) Development and testing of age-appropriate narratives exploring DOHaD research data and its relevance in different socio-cultural contexts.
- 3) Utilization of bio-markers to support medium- to long-term tracking of risk reduction potential in adolescent behavior-change programs.

## **THE POTENTIAL OF UNDERGRADUATE COURSES TO FACILITATE UNDERSTANDING OF DOHAD CONCEPTS IN POPULATIONS OF FUTURE HEALTH PROFESSIONALS**

***Professor Masahito Oyamada***

*Department of Food Science and Human Nutrition, Fuji Women's University, Hokkaido, Japan*

With the accumulation of compelling evidence, the DOHaD hypothesis has reached the stage of translational research for prevention of NCDs. Knowledge of baseline understanding of DOHaD concepts is required to inform the development of knowledge translational interventions. To address the lack of research surrounding public understanding of DOHaD concepts, we have initiated The Public Understanding of DOHaD Project (<http://urx.nu/dQJO>), a collaboration with LENSscience.

In this collaboration, we developed standardised questionnaires to ascertain knowledge of DOHaD concepts and conducted a survey of which participants were undergraduate nutrition students (Japan) and undergraduate nursing students (NZ). Our results showed that, although exposure to DOHaD concepts in the course was associated with a high level of awareness of the term 'DOHaD' in the students, the knowledge levels remained relatively low. We need to review the DOHaD aspects of the learning programme and design a revised programme to translate the concepts effectively.

### **Proposal for research collaboration**

Development of DOHaD-related curricula for health professional education

## RESEARCH IN NUTRITION AND CHRONIC DISEASE PREVENTION

### ***Professor Blakely Brown***

*Department of Health and Human Performance*

*The University of Montana, U.S.A.*

My research primarily focuses on nutrition and chronic disease prevention, maternal-child health, food security and access, childhood obesity and diabetes prevention, community-based participatory research methods, mixed methods research (qualitative and quantitative) and Native American health. My research gaps include international research collaborations for prevention of non-communicable diseases in children, with special emphasis on Indigenous populations.

### **Proposal for research collaboration**

Potential research and project collaborations include rural health interventions and programs focused on improving food access and security, increasing intake of nutritious and low-energy dense foods, and increasing physical activity in children and families.



## LIFE COURSE AND HEALTH INTERVENTIONS

***Dr Anne Jaquiery***

*Liggins Institute, The University of Auckland, New Zealand*

'Life course' theory suggests that pregnancy and early childhood are times when health interventions are likely to be most effective in decreasing later risk of non-communicable disease. It is also a time when people are likely to be in regular contact with health professionals, and may be receptive to education about healthy lifestyles. Nutrition is a key environmental factor in fetal and infant growth and development. Maternal diet, mode of infant feeding and nutrition in early childhood are all potentially modifiable factors that may impact on later health outcomes. Education is necessary for the Maternal and Child Health Workforce, translating research findings using consistent evidence-based messages to explain the principles on which current clinical guidelines are based and highlight areas of controversy. For relevant behaviour change to occur, effective communication strategies are needed to increase health literacy and self-efficacy in their clientele and support lifestyle changes they wish to make.

## FETAL AND NEONATAL NUTRITION IMPACT UPON LIFELONG METABOLIC HEALTH

***Professor Frank Bloomfield***

*Director Liggins Institute*

*The University of Auckland, New Zealand*

Research interests include fetal and neonatal nutrition and how these impact upon lifelong metabolic health. These questions can be approached both through experiments in animals, such as the fetal or preterm lamb, and in clinical trials.

We currently are pursuing both approaches, investigating the potential for nutrient supplements to restore beta cell mass in preterm lambs and the role of increased protein to optimise growth trajectory and metabolic health in extremely preterm babies (more participating sites are needed for this randomised controlled trial).

The next step is to investigate nutrition in moderate and late preterm babies, including not just macronutrient intakes but also breast milk composition and the role of smell and taste.

### **Proposal for research collaboration**

This is an area for potential collaboration, particularly the interaction between nutrition and sex of the infant. A further area of interest is twins: in particular, what are the signals that make twins develop differently from singletons *in utero* and have different lifelong risks for non-communicable disease? Can we use information from altered development in twins to understand the drivers of altered development in response to the environment in singletons?

## PHYSICAL ACTIVITY IN DOHaD

**Dr Tomoko Aoyama**

*Japan Society for the Promotion of Science*

*Department of Nutritional Science, National Institute of Health and Nutrition, NIBIOHN, Tokyo, Japan*

Low birthweight has been associated with lower levels of physical activity as assessed by questionnaires and lower cardiorespiratory fitness (CRF) in later life. We examined the association between birthweight and physical activity patterns objectively measured using accelerometry in 385 children aged 6–12 years. Our results showed an association between birthweight and sedentary behavior ( $\leq 1.5$  METs) patterns in Japanese children with birthweight  $\geq 1.5$  kg. We also examined whether physical activity may modify associations of birthweight with CRF in 535 children aged 7–12 years. The results showed that the association of birthweight with CRF was not modified by levels of physical activity assessed by questionnaires. However, vigorous physical activity was found to be a stronger predictor of CRF than was birthweight, suggesting that physically active lifestyle which focuses on vigorous intensity activity may have a much more important role in development of CRF than an individual's low birthweight.

### **Proposal of research collaboration**

We preliminarily found that earlier infant motor development such as walking unassisted might contribute to higher levels of physical activity in 6–12 years children in our retrospective study (under submission). Birth cohort studies including accurate assessment of physical activity by using accelerometer in infancy, childhood, and adolescence would be needed 1) to establish a causal association between infant motor development and physical activity patterns in later life and 2) to elucidate early predictors of infant motor development.

## THE 'GUT' MICROBIOME: CURRENT EVIDENCE, GAPS, AND OPPORTUNITIES

***Dr Justin M. O'Sullivan***

*Genetics and Genome Organisation*

*Liggins Institute, The University of Auckland, New Zealand*

There have been 18,962 papers on the microbiome published since 1956 (>5400 in 2015). These papers have typically been correlative, focussing on microbial composition and disease. The international human microbiome project is generating the resources to enable the comprehensive characterisation of the human microbiome and its role in human health and disease.

At the Liggins Institute, we have moved away from simply correlating structural changes at the community level with phenotypic outcomes. Instead, we are integrating existing (e.g. HMP) data and new metagenomic, metatranscriptomic, and metabolomics data to identify the timing and mechanism of microbe-host communication and the direct effects on the host. This approach will enable us to investigate the developmental origins by: 1) identifying the mechanism(s) and critical time-points for microbial-host communication; and 2) demonstrating that the effects are modifiable and reversible.

# ASSOCIATION BETWEEN LOW BIRTH WEIGHT AND CHILDHOOD-ONSET CHRONIC KIDNEY DISEASE IN JAPAN: A COMBINED ANALYSIS OF NATIONWIDE SURVEY FOR PEDIATRIC CKD AND NATIONAL REPORT OF VITAL STATISTICS

***Assistant Professor Daishi Hirano***

*Department of Pediatrics, The Jikei University School of Medicine, Tokyo, Japan*

Although the early programming of chronic kidney disease (CKD) involves various pathophysiological and molecular biological mechanisms, only a few have been elucidated. Reduced nephron endowment is currently thought to play an important role in the development of CKD. However, the associations of not only intrauterine growth restriction (IUGR) but also preterm birth (PTB) with later kidney dysfunction in children are subtle and require investigation.

Therefore we conducted the study. Data on sex, low birth weight (LBW) incidence, and gestational age were compared between pediatric CKD cases and a control group. Pediatric CKD cases were obtained from a nationwide survey conducted by the Pediatric CKD Study Group in Japan. The population attributable fraction was calculated to evaluate the effects of reducing the prevalence of LBW infants (LBWI). In the results of this nationwide study, we found that both birth weight and gestational age are strongly associated with childhood-onset CKD.

## **Proposal of research collaboration**

- 1) IUGR animal model: kidney dysfunction and IUGR rat  
to investigate the number of nephron of Intrauterine growth restricted offspring rats
- 2) Prospective cohort study (using birth cohort): to investigate association between LBW and childhood-onset CKD

## **DAMPENING THE FLAMES OF INFLAMMATION: A ROLE FOR INFLAMMATORY SIGNALING IN MATERNAL DIET-INDUCED DEVELOPMENTAL PROGRAMMING**

***Dr Clare Reynolds***

*Developmental Programming, Nutrition*

*Liggins Institute, The University of Auckland, New Zealand*

The links between obesity, insulin resistance and immune function have provided the basis for the emerging field of immuno-metabolism. While evidence of immune cell infiltration and increased expression of inflammatory mediators have provided many clues as to the mechanisms through which “meta-inflammation” instigates metabolic dysfunction, there are many questions which remain unanswered, particularly in relation to the developmental programming of health and disease. These questions are central to my current research focus. We have recently concluded a study which examined high-fat-induced inflammation during pregnancy and subsequent offspring long-term metabolic disease in an established rat model of maternal diet-induced obesity. This study also investigated the therapeutic effectiveness of maternal diet supplementation with the anti-inflammatory lipid CLA.

Current research focuses on the mechanistic role of IL-1 signaling on maternal metabolic stress during pregnancy and subsequent offspring health. Improved mechanistic understanding may provide avenues for the development of either pharmaceutical or nutritional interventions.

### **Proposal of research collaboration**

As this research centers on pre-clinical models, avenues for effective translation are essential. We aim to access biological samples under differing early life conditions including maternal obesity, premature birth and gestational diabetes.

## **ADIPOSE TISSUE MAL-DEVELOPMENT IN PRETERM LOW BIRTH WEIGHT INFANTS**

***Assistant Professor Yuya Nakano***

*Department of Pediatrics*

*Showa University School of Medicine, Tokyo, Japan*

We investigate longitudinal changes in serum adiponectin levels during infancy in term and preterm infants. The serum levels of high-molecular-weight adiponectin (HMW-Ad) in preterm infants were significantly lower than the levels in term infants at birth. An accumulation of the subcutaneous fat contributes to increased production of HMW-Ad in preterm infants between birth and term-equivalent age, probably suggesting that an increased number of small adipocytes during this period may contribute to increased levels of adiponectin. Paradoxically decreased levels of adiponectin in adults and children with obesity are considered to result from adipocyte hypertrophy. Interestingly, postnatal growth between term-equivalent age and 12 months-equivalent age in term and preterm infants did not influence the changes in HMW-Ad levels during this period. Possibly, the period up to term-equivalent age in preterm infants might be a key age for the fat tissue development including the fat cell number throughout their life.

### **Proposal of research collaboration**

Retrospective or prospective study of mal-development in preterm infants, especially concerning changes in a number and size of fat cell associated with nutritional managements during the NICU stay

## PARTICIPANTS - JAPAN



**Yoshihiro Ogawa, Professor - Tokyo Medical and Dental University**

*Internal Medicine, Endocrinology and Metabolism, Diabetes*



**Hiroaki Itoh, Professor – Hamamatsu University School of Medicine**

*Obstetrics, Animal Models*



**Masahito Oyamada, Professor – Fuji Women's University**

*Fetal Epigenetics*



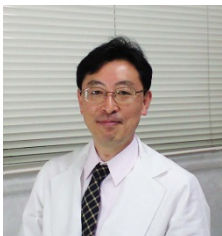
**Koshi Hashimoto, Assoc. Professor – Tokyo Medical and Dental University**

*Internal Medicine, Molecular Endocrinology*



**Hideoki Fukuoka, Professor – Waseda University**

*Fetal Epigenetics*



**Takeo Kubota, Professor – University of Yamanashi**

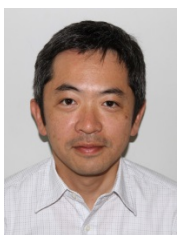
*Epigenetics, Molecular Biology*



**Fumihiro Sata, Adjunct Lecturer – Tokyo Medical and Dental University**

*Analytical Epidemiology*





**Kenichiroh Hata, Chief Scientist – National Center for Child Health & Development**  
*Epigenetics, Molecular Biology*



**Hidemi Takimoto, Chief Scientist – National Institute of Nutrition**  
*Maternal and Child Health*



**Daishi Hirano, Assist. Profesor – Jikei University School of Medicine**  
*Pediatrics, Nephrology*



**Yuya Nakano, Assist. Professor – Showa University**  
*Neonatology, Endocrinology*



**Kohta Suzuki, Assoc. Professor – University of Yamanashi**  
*Epidemiology: perinatal, maternal and child health*



**Tomoko Aoyama, Research Fellow – National Institute of Nutrition and Japan  
Society for the Promotion of Science** *Physical activity in DOHaD*



**Naoka Arata, Chief Scientist - National Center for Child Health and Development**  
*Endocrinology and diabetes associated pregnancy*

## **PARTICIPANTS – SINGAPORE and USA**



***Chong Yap Seng, Assoc. Professor – National University of Singapore, Singapore  
Institute for Clinical Sciences***

*Fetal Growth and Early Development, Metabolic Disease*



***Blakely Brown, Professor – Dept of Human Health & Performance, University of  
Montana, USA***

*Nutrition, Chronic Disease Prevention*

## PARTICIPANTS - NEW ZEALAND



**Sir Peter Gluckman, Professor – Liggins Institute, the University of Auckland**  
*Evolutionary Medicine, Developmental Epigenetics, International Healthy Start to Life project, Chief Science Advisor to the Prime Minister of New Zealand*



**Frank Bloomfield, Professor – Director Liggins Institute, the University of Auckland**  
*Fetus and Newborn, Nutrition*



**Jacquie Bay – Director LENSscience (Liggins Education Network for Science)**  
*Science Education*



**Mark Vickers, Assoc. Professor - Liggins Institute, the University of Auckland**  
*Developmental Programming, Nutrition*



**David Cameron-Smith, Professor – Research Director Liggins Institute, the University of Auckland**  
*Nutrition*



**Wayne Cutfield, Professor – Liggins Institute, the University of Auckland**  
*Paediatric Endocrinology, Nutrition*



**Susan Morton, Assoc. Professor – Faculty of Medical & Health Sciences, the University of Auckland**  
*Epidemiology, Public Health, Director Growing up in New Zealand*



**Peter Dearden, Assoc. Professor – the University of Otago, Scientific Director Genetics Otago**

*Evolution and Development, Epigenetics and Developmental plasticity*



**Clare Wall, Assoc. Professor – Faculty of Medical & Health Sciences, the University of Auckland**

*Nutrition*



**Timothy Kenealy, Associate Professor – Faculty of Medical & Health Sciences, the University of Auckland**

*Integrated Care, Diabetes in Primary Care*



**Allan Sheppard, Senior Researcher – Liggins Institute, the University of Auckland**

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**Anne Jaquery, Senior Lecturer Clinical and Medical – Liggins Institute, the University of Auckland**

*Neonatal and Paediatric Nutrition*



**Justin O'Sullivan, Senior Researcher – Liggins Institute, the University of Auckland**

*Genetics and Genome Organisation*



**Clare Reynolds, Research Fellow – Liggins Institute, the University of Auckland**

*Developmental Programming, Nutrition*



**Anecita (Gigi) Lim, Senior Lecturer – School of Nursing, FMHS, the University of Auckland (Nurse-Pharmacologist)**

*Primary Healthcare, Asian Health, Obesity*



**Tony Pleasants, Honorary Academic– Liggins Institute, the University of Auckland  
Senior Scientist, AgResearch NZ**

*Epigenetics and Developmental Plasticity*



**Ben Albert, Research Fellow – Liggins Institute, the University of Auckland**

*Paediatric Endocrinology*



**Jane Duffy, Project & Communications Manager, LENSscience – Liggins Institute, the University of Auckland**



**Megan Stünzner, Executive Assistant to Sir Peter Gluckman – Liggins Institute, the University of Auckland**

August 13, 2015

Consul-General's Greeting



My name is Yoshitaka Yokoyama and I arrived at the beginning of April to begin my post as Consul General of Japan in Auckland.

I have never had the chance to come to New Zealand before now, and as this is my first time in the Oceania region it is a new challenge for me. I look forward to bringing my best to this role.

My previous overseas postings with the Japanese Ministry of Foreign Affairs have included much experience in Eastern Europe and wider Europe, and at the Ministry's home office in Tokyo I have worked in several areas including the European Affairs Bureau, the Economic Cooperation Bureau, and the United Nations Policy Bureau. My recent work has been with Disarmament and Refugee Assistance.

The Consulate-General of Japan in Auckland oversees almost the entire upper half of the North Island, and there are so many Japanese people living and working in Auckland and across this region. I was really impressed to see the energetic activities of the Japanese Community in Auckland through the large-scale Japan Day 2015 cultural event which took place straight after my arrival here.

My role here includes supporting the Japanese community, encouraging Japan-affiliated businesses, and promoting Sister City relations as well as cultural and sports exchanges. I also look forward to working with the people of Auckland and New Zealand to deepen the relationship between our countries.

April 2015  
Consul-General of Japan in Auckland  
Yoshitaka Yokoyama

# Funding opportunities for DOHaD research collaborations between New Zealand and Japan

Sarah Taylor – Research Development Coordinator, Liggins Institute

## 1. INTRODUCTION

### Scope

Within the New Zealand research environment, a number of opportunities are available to secure funding for international collaborations between DOHaD researchers, both at a program level and for individual scientists. This paper identifies the key potential sources open to New Zealand researchers to fund both general collaborations, and those specific to New Zealand-Japan partnerships. The information has been collated from funders' websites, and as such is subject to change. Unless otherwise stated, the currency is in New Zealand dollars.

In addition to the opportunities below, many of the research grants offered by New Zealand-based funders encourage international collaborations as part of the wider research proposal, and may fund elements of this. A comprehensive list of funding rounds will be published by the University of Auckland Research Office in early 2016, with additional opportunities announced throughout the year, as information from the funders is released.

### New Zealand scientific investment context

In New Zealand, the key investment pool that specifically fosters international collaboration is the Ministry of Business, Innovation and Enterprise (MBIE) Catalyst Fund, which allocates approximately \$9 million per annum. Prior to 2015, this was known as MBIE International Partnerships Fund, which supported around 50 individual programmes and grants. This was redesigned to form the new overarching Catalyst Fund, which has been split into four investment streams: Strategic, Seeding, Leaders, and Influence with various grants underlying each of these. Some of the details of the new grants have yet to be announced, with more information likely to be released in early 2016. Details of grants likely to be applicable to DOHaD partnerships are contained in the relevant section below.

## 2. OPPORTUNITIES SPECIFIC TO NEW ZEALAND AND JAPAN/ASIA

A number of grants exist which specifically target collaborations between New Zealand and Japan/Asia. These include:

Funder/grant	Description	Value*	Grant term	Likely timeline*
NZ-Japan Scientist Exchange Programme <sup>1</sup> - Joint Research Projects  <i>(Administered by the Royal Society of New Zealand (RSNZ))</i>	Funds the establishment of cooperative research networks between New Zealand and Japan. Includes expenses for travel, local costs, symposiums and seminars, and research activities.	Up to \$30,000k per project	Up to two years	August 2016
NZ-Japan Scientist Exchange Programme – Postdoctoral Fellowships	Provides opportunities for young postdoctoral researchers from New Zealand to conduct co-operative research with leading research groups in Japanese	A round trip air-ticket and insurance; a monthly maintenance allowance of \$362,000; a settling in allowance of \$200,000	One to two years	March 2016

<sup>1</sup> The NZ-Japan Scientist Exchange Programme was established by the Japan Society for the Promotion of Science (JSPS) and MBIE to facilitate bilateral research, and various granting rounds operate under the umbrella programme.

<i>(Administered by the RSNZ)</i>	universities and research institutes.			
NZ-Japan Scientist Exchange Programme – Short Term and Long Term Fellowships  <i>(Administered by the RSNZ)</i>	Provides New Zealand scientists with opportunities for short-term and one long-term visits to Japan to strengthen science and technology cooperation between the two countries.	A round-trip air ticket; domestic travel costs of ¥150,000 (short-term exchange) or ¥100,000 (long-term exchange); a daily maintenance allowance of ¥18,000 (short-term exchange) or a monthly maintenance allowance of ¥369,000 (long-term exchange); research expenses up to ¥40,000 (long-term exchange only)	Short-term exchanges: 14 to 60 days  Long-term exchange: 2 to 10 months	March 2016
e-ASIA Joint Research Programme  <i>(Administered by the Health Research Council)</i>	To initiate multilateral joint-research programmes in the East Asian region – both NZ and Japan are members.	Up to 450,000 for one project	Three years	Second half of 2016

*\*Based on 2015 submission information – 2016 details have yet to be announced.*

### 3. PROGRAM-BASED COLLABORATIONS

The following grants provide for larger-scale program or project based collaborations, and are not specific to any one nationality:

Funder/grant	Description	Value	Grant term	Likely timeline
MBIE Catalyst Fund – Global Strategic Partnerships  <i>(Administered by MBIE)</i>	Enables New Zealand research teams to develop enduring large-scale science and innovation collaboration partnerships with world-class foreign counterparts. Defined international partner countries with priority topic areas.	\$80k to \$150k per annum to a maximum of \$450k total	One to three years	Up to two calls for proposals per year
MBIE Catalyst Fund – Seeding grants  <i>(Administered by the RSNZ)</i>	Funds new small and medium pre-research strategic partnerships between world-class research groups, with a view to developing full collaborations that could be supported through Catalyst: Strategic.	Up to \$80,000 total per project	Up to two years	Tri-annual call for proposals. First call likely late January 2016
Human Frontier Science Program – Program Grants and Young Investigators Grants	Supports innovative basic research into fundamental biological problems. Applicants must be integrated into an international team, with emphasis/preference for intercontinental collaborations. Number of team members should normally be 2 to 4.	Up to US\$450,000 per year, depending on the size of the team	Three years	Letter of intent due March 2016



#### 4. VISITING FELLOWSHIPS

There is a range of fellowship opportunities available for both incoming and outgoing researchers, including:

Funder/grant	Description	Value	Grant term	Likely timeline
MBIE Catalyst: Leaders  <i>(Administered by the RSNZ)</i>	Will support incoming and outgoing targeted international fellowships for exceptional individuals in key science and innovation hubs, to meet specific capability needs for New Zealand benefit. Details of specific grant value and structure yet to be announced.			Annual call for proposals – likely late January 2016
Auckland Medical Research Foundation (AMRF) Sir Harcourt Caughey Award	Supports both NZ medical graduates to train/undertake research overseas OR funds prestigious visitors to visit Auckland, to foster interest and research in a speciality.	Up to \$25,000	Variable	Applications closed January 2016
AMRF Gavin and Ann Kellaway Medical Research Fellowship	Supports medical researchers who are already established in a field in Auckland who would gain value in furthering their expertise at an overseas research institution.	Up to \$20,000 per month	Two to three months. Periods up to six months may be negotiated	Applications closed January 2016
Matsumae International Foundation Fellowships	Supports research projects by non-Japanese applicants to be conducted in Japan, with preference for the fields of natural science, engineering and medicine.	A monthly stipend of ¥220,000, insurance, round-trip air ticket, and a lump sum of ¥120,000 on arrival	Three to six months	August 2016
Distinguished Visitor Awards  <i>(University of Auckland (UoA) internal funding)</i>	Enables researchers who have made very significant contributions to their disciplines to visit the UoA and contribute to research activity, give seminars, etc.	Up to \$10,000, depending on time spent at the UoA	Minimum two weeks	Mid-2016
The Hood Fund Fellowships  <i>(UoA internal funding)</i>	Aims to enhance the interaction between UoA staff and leading international talent. The fund provides for both incoming and outgoing fellowships.	Up to \$20,000	Not defined	Likely mid-2016
Seelye Fellowships  <i>(UoA internal funding)</i>	Helps the UoA to attract distinguished researchers who are leaders in their field, and/or host internationally recognized experts for guest lectures and seminars.	\$10,000-\$20,000	Two weeks to three months	Likely late-2016
International Central Networks Fund (ICNF)  <i>(UoA internal funding)</i>	Supports outgoing visits by UoA staff to access collaborative opportunities in any of the University's three networks. This includes members of the Association of Pacific Rim Universities, which includes various Japanese institutions	Up to \$5,000 to attend <i>network-branded</i> events and/or visit network partners to explore opportunities for collaboration.  Up to \$8,000 for visiting fellowships in order to develop institutional links with two to four network partners	Not defined	Two rounds likely in 2016 (March and August)

## 5. TRAVEL GRANTS AND COLLABORATIVE FORA

A number smaller-value travel grants are also available to New Zealand-based researchers, as is funding for conferences, workshops and participation in other collaborative fora. Note, the JSPS New Zealand-Japan Scientist Exchange Programme Joint Workshops fund has been discontinued from 2016.

Funder	Purpose	Value	Likely timeline
Auckland Medical Research Foundation	Support medical researchers to present their research at a meeting/conference; attend training courses on research methods; or visit a laboratory to learn a new research technique.	Up to NZ\$3,000	Two to three calls throughout 2016
Maurice and Phyllis Paykel Trust	Helps health researchers travel to scientific meetings, research centres, training, or short-term work in laboratories.	Up to NZ\$3,000	Three calls throughout 2016
NZ-Japan Scientist Exchange Programme – HOPE Meetings <i>(Administered by the RSNZ)</i>	To support up to 5 PhD students or young postdoctoral researchers to attend the annual HOPE meeting in Japan.	Return airfare and insurance	August 2016 (based on 2015 round)
MBIE Catalyst: Influence <i>(Administered by MBIE)</i>	A total funding pool of approximately \$450k to support New Zealand's science sector participation in key international science fora and targeted engagement that cannot be supported through other means.	More information will become available in 2016	
The Japan Foundation – Intellectual Exchange Conferences Grants	Supports international conferences and other dialogue activities on global issues and/or strengthening the ties between Japan and other countries. Grants have generally been targeted at cultural issues, rather than health/science.	Recent grant value is approximately ¥2 million (NZ\$25k)	Late 2016

## ATTACHMENT 1 – SOURCES OF FURTHER INFORMATION

Fund	Link
Auckland Medical Research Foundation	<a href="http://help.medicalresearch.org.nz/?src=34978#147-en">http://help.medicalresearch.org.nz/?src=34978#147-en</a>
Distinguished Visitor Award*	<a href="https://www.staff.auckland.ac.nz/en/research-36/funding-application-support-services/university-sponsored-funding/distinguished-visitor-award-dva.html">https://www.staff.auckland.ac.nz/en/research-36/funding-application-support-services/university-sponsored-funding/distinguished-visitor-award-dva.html</a>
e-ASIA Joint Research Programme	<a href="http://www.the-easia.org/jrp/index.html">http://www.the-easia.org/jrp/index.html</a>
The Hood Fund Fellowships	<a href="http://www.uoafoundation.org.nz/hood.html">http://www.uoafoundation.org.nz/hood.html</a>
Human Frontier Science Program	<a href="http://www.hfsp.org/funding/research-grants/information-and-guidelines">http://www.hfsp.org/funding/research-grants/information-and-guidelines</a>
International Central Networks Fund*	<a href="https://www.staff.auckland.ac.nz/en/how-the-university-works/international-opportunities-and-linkages/international-networks/network-related-funding-opportunities.html">https://www.staff.auckland.ac.nz/en/how-the-university-works/international-opportunities-and-linkages/international-networks/network-related-funding-opportunities.html</a>
The Japan Foundation Intellectual Exchange Conference Grants	<a href="https://www.jpf.go.jp/e/project/intel/exchange/support/">https://www.jpf.go.jp/e/project/intel/exchange/support/</a>
Maurice and Phyllis Paykel Trust Travel Grants	<a href="http://www.paykeltrust.co.nz/travel-grants/">http://www.paykeltrust.co.nz/travel-grants/</a>
Matsumae International Foundation Fellowship	<a href="http://www.mif-japan.org/fellowship/announcement/?hl=en">http://www.mif-japan.org/fellowship/announcement/?hl=en</a>
MBIE Catalyst Funds	<a href="http://www.mbie.govt.nz/info-services/science-innovation/investment-funding/current-funding/funding-for-international-partnerships">http://www.mbie.govt.nz/info-services/science-innovation/investment-funding/current-funding/funding-for-international-partnerships</a>
NZ-Japan Scientist Exchange Programme	<a href="http://www.royalsociety.org.nz/programmes/funds/international-relationships/nz-japan/">http://www.royalsociety.org.nz/programmes/funds/international-relationships/nz-japan/</a>
Seelye Fellowships	<a href="http://www.uoafoundation.org.nz/seelye.html">http://www.uoafoundation.org.nz/seelye.html</a>

\*Website only accessible to UoA staff members





# THE UNIVERSITY OF AUCKLAND

## GRAFTON

Te Whare Wananga o Tamaki Makaurau

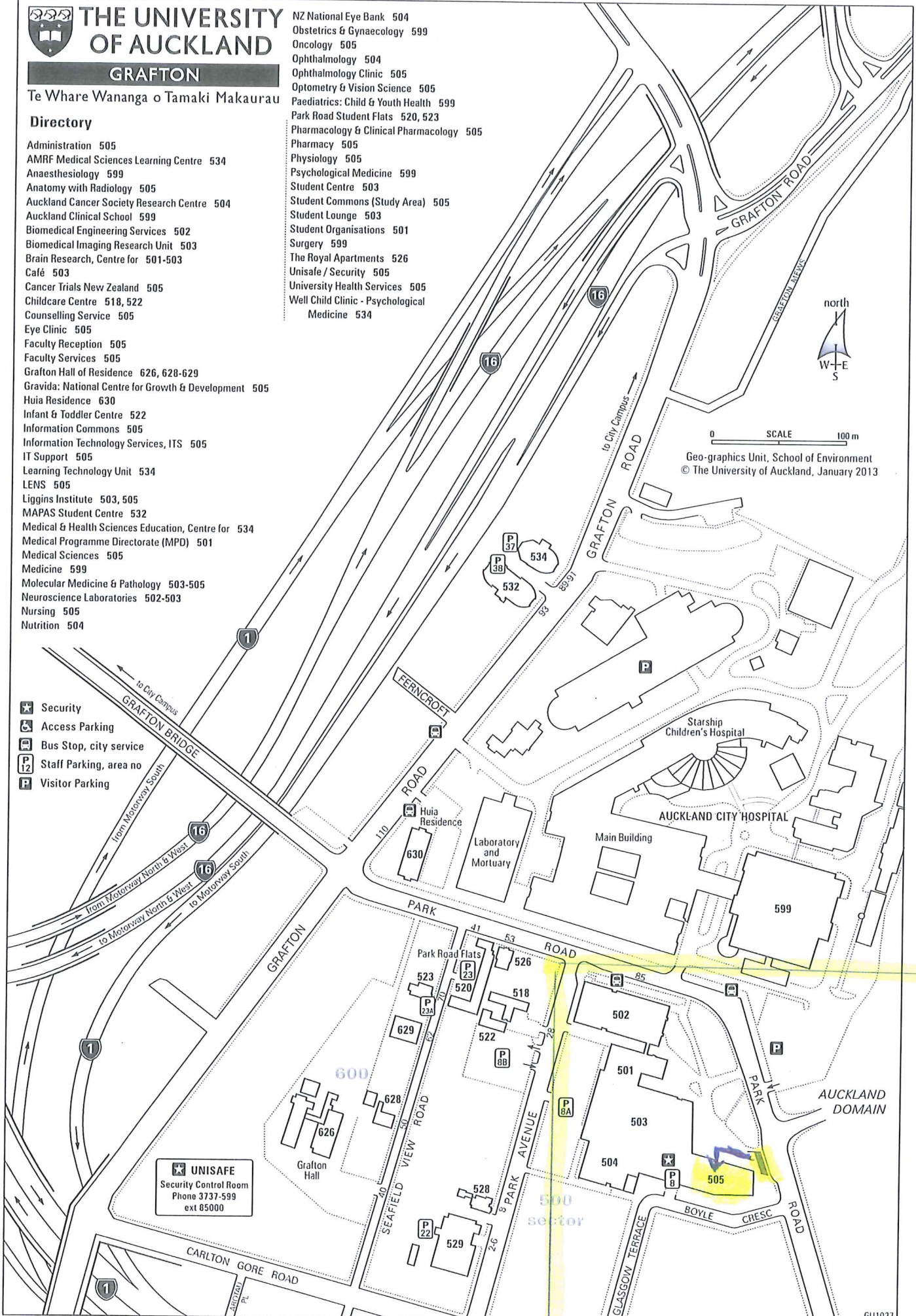
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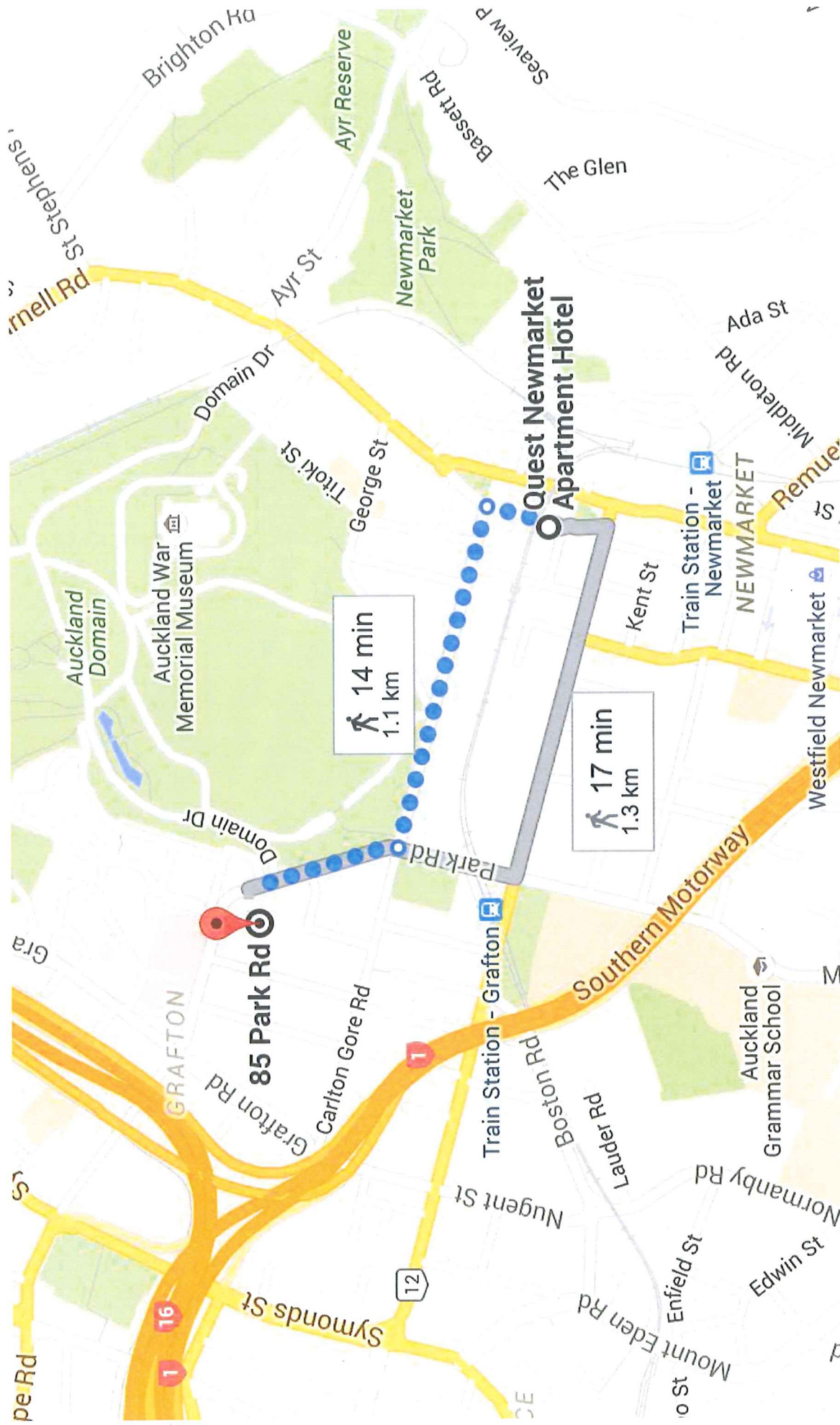
**UNISAFE**  
Security Control Room  
Phone 3737-599  
ext 85000



Geo-graphics Unit, School of Environment  
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SEE NEXT MAP

# Directions from Quest Newmarket Apartment Hotel to 85 Park Rd



**Quest Newmarket Apartment Hotel**

31-39 Davis Crescent, Newmarket, Auckland 1023

↑ Head north on Davis Cres toward Carilton Gore Rd

120 m

↩ Turn left onto Carilton Gore Rd

650 m

↪ Turn right onto Park Rd

290 m

**85 Park Rd**

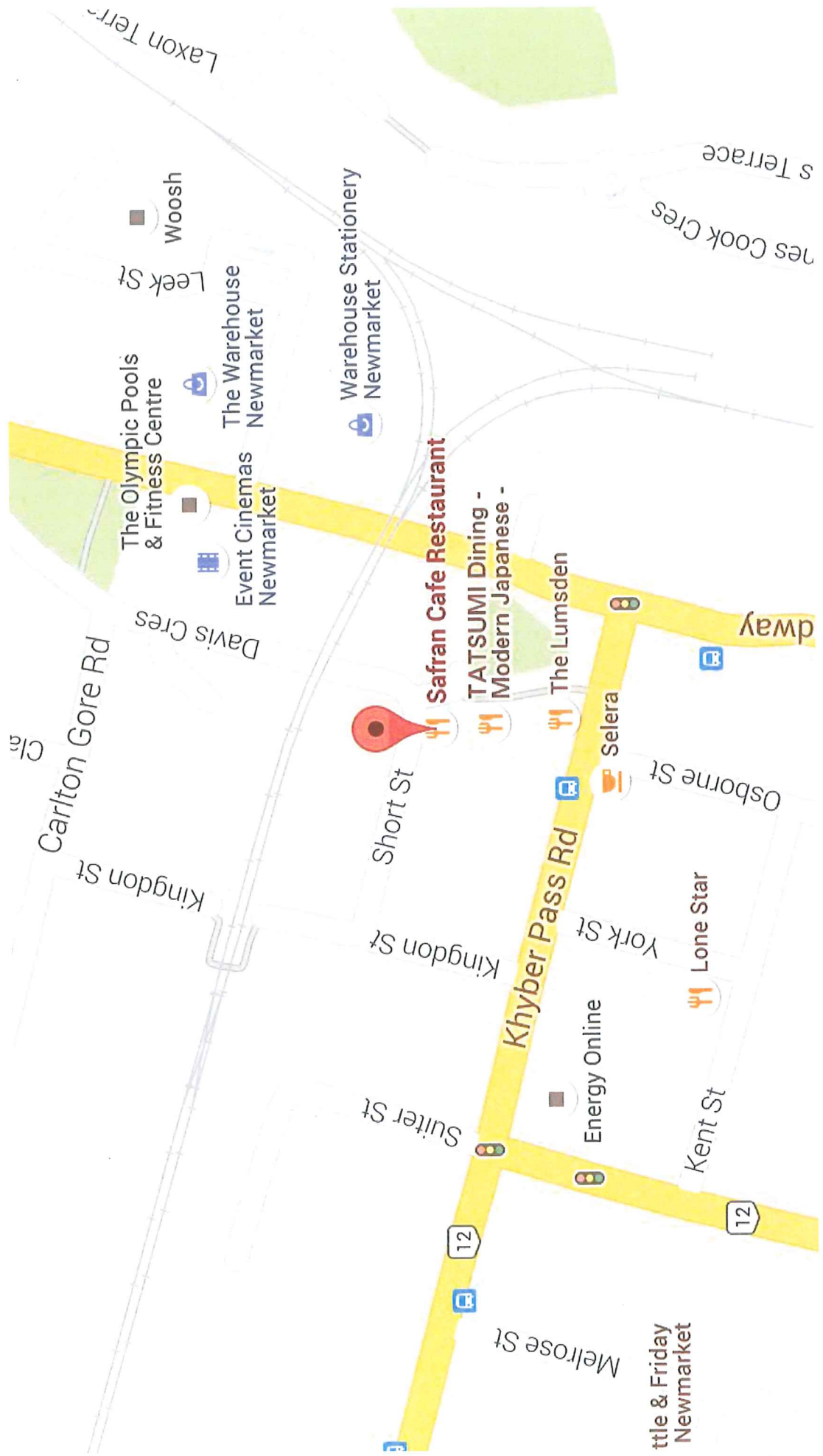
Grafton, Auckland 1023

These directions are for planning purposes only. You may find that road works, traffic, weather or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



### Safran Cafe Restaurant

71 Davis Cres, Newmarket, Auckland 1023  
09-520 5664





# Banque Oyster Bar & Eatery

311 Remuera Rd, Remuera 1050

09-522 6688

