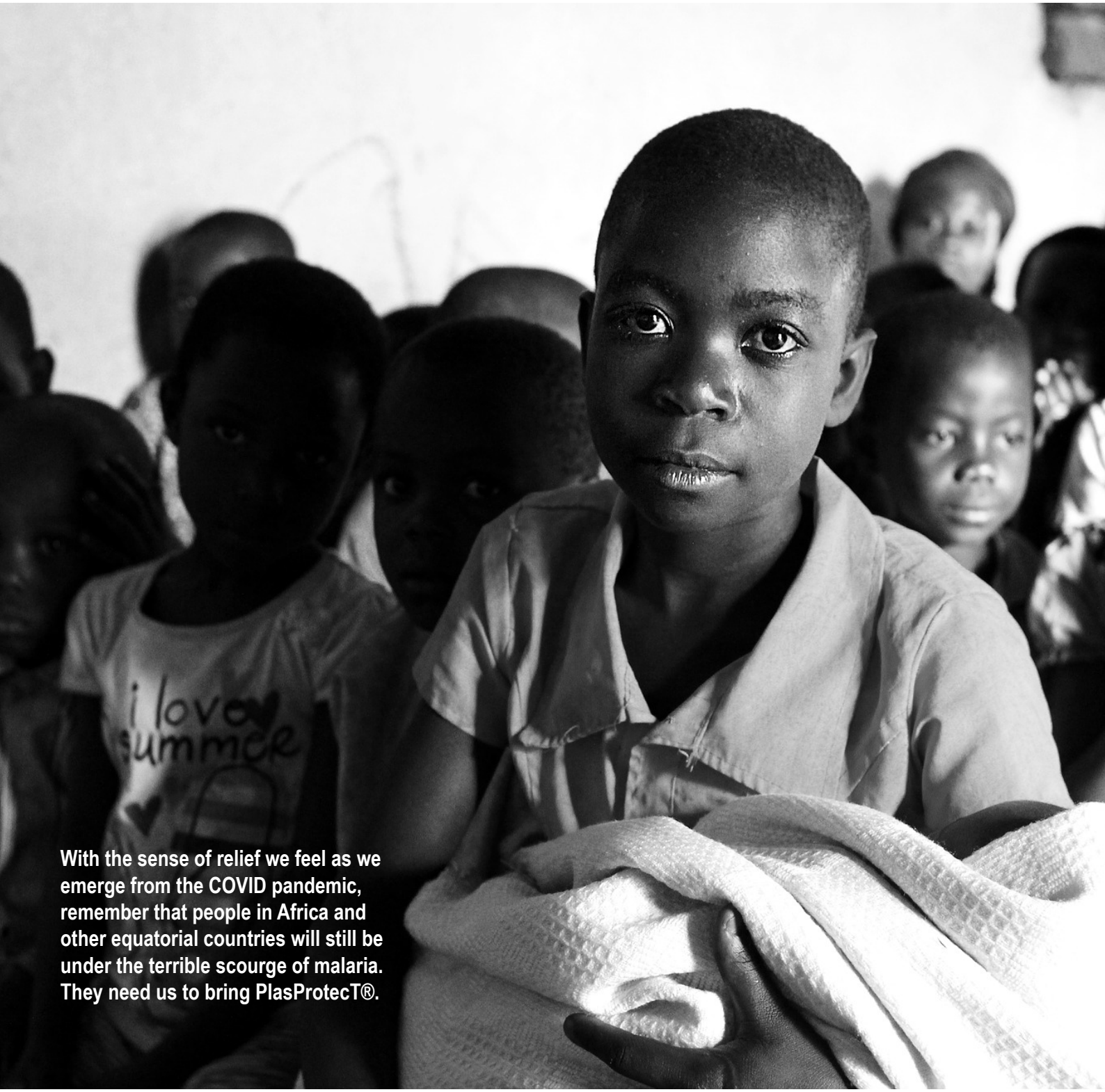
Griffith UNIVERSITY
Institute for Glycomics
Queensland, Australia

Rotary
District 9640

Malaria Vaccine Project

PATRONS
Hon Lawrence Springborg
PRID Noel Trevaskis OAM
PRIP Glen W Kinross AO



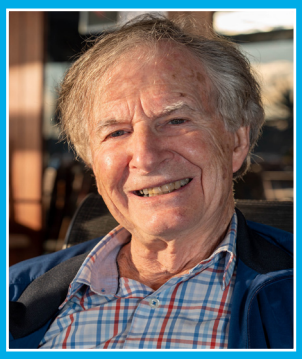
With the sense of relief we feel as we emerge from the COVID pandemic, remember that people in Africa and other equatorial countries will still be under the terrible scourge of malaria. They need us to bring PlasProtecT®.

MALARIA VACCINE PROJECT

Newsletter Issue 9 - March 2021

MALARIA VACCINE PROJECT NEWSLETTER COMMITTEE

PDG Sandy Doumany
Chair



Gerard Brennan OAM
Committee Member

Laraine Brennan
Committee Member

Nina Kristensen
Advancement Manager
Institute for Glycomics

OUR HISTORY

In 2015 Sam & PDG Sandy Doumany attended a Rotary Against Malaria Conference, with Dr Danielle Stanisic as the Guest Speaker on Research for a Malaria Vaccine. She mentioned that the Laboratory needed a Separator which would cost $8000.

Sam took that on board and approached PDG Graham Jones to see if we could raise the money required. Within a week, Graham, Sam & other Rotarians had raised the funds.

The Griffith Rotary Satellite Club was in the formation period and the cheque was presented to Dr Danielle Stanisic (a prospective member) at the next meeting. We all felt this sent a message to the new members "THIS IS THE POWER OF ROTARY".

In 2016 Gerard Brennan had discussions with the Governor General's Office in Canberra which led to the Governor General, Sir Peter Cosgrove, launching the Malaria Vaccine Project at a function in the Institute for Glycomics on 27 March 2017.

In 2019 the Australian Government made a Research Grant to the Project of $500,000 matching the amount raised by Rotarians to that time.

On learning more about the journey for Professor Michael Good and Dr Danielle Stanisic with their research, there was a core of Rotarians who developed a passion to be part of the quest to save the lives of so many men, women and children and eliminate malaria from the world.

Committee Chair	PDG Graham Jones AM
Committee	Neil Jones (Treasurer)
	Laraine Brennan (Secretary)
	Gerard Brennan OAM
	Hon Sam Doumany
	PDG Sandy Doumany
	Teresa Dawson
	Karin Kolenko
	Mervyn Powell
	PDG Ross Smith

Rotary
District 9640

CHAIRMANS' MESSAGE

The word vaccine has taken on a whole new meaning in 2021. We are all avid spectators in the manufacture and rollout of COVID vaccines in northern hemisphere countries and their imminent arrival in Australia. The terms Pfizer, AstraZeneca and Moderna have become household names in a world that longs for the abatement and elimination of COVID 19.This predilection with vaccines and the new insights gained in vaccine research could generate the very wave of heightened interest and financial support that is needed to propel the development of a malaria vaccine. There are already signs that malaria vaccine research is being recognised with renewed interest. In November 2020, the EU Malaria Fund (EUMF) gave a grant of €12.9 million to Sanaria (Dr Stephen Hoffman) for the development of two malaria vaccines that are whole organism vaccines similar to that of Professor Good's PlasProtecT®. While EUMF has been a strong supporter of prevention programs (nets, spraying, education) this is the first time it has provided major support for malaria vaccine development. This funding was heralded by Dr Pedro Alfonso (Director, WHO Global Malaria Program) especially as WHO had highlighted "a plateau of progress" and "a missing of malaria targets" in its 2020 World Malaria Report. This is good news for us and underscores the need for the Malaria Vaccine Project to position itself for similar funding opportunities. On the research side Professor Good is moving forward with key preliminary studies on the "lipid" form of the vaccine. This lipid vaccine will allow PlasProtecT® to be freeze-dried and transported anywhere in the world. Professor Good's plan for 2021 is to manufacture the lipid vaccine in Brisbane and test it pre-clinically, prior to undertaking a formal 'toxicology assessment'. He and his team will then proceed to a Phase 1(b) Clinical Trial that would assess safety and immunogenicity, prior to testing the vaccine in a malaria-endemic country. These preliminary studies are possible as a result of the money given by you and the Federal Government through the Malaria Vaccine Project. I say a huge thank you and at same time reach out for your support during 2021. If we can have another great year of fundraising from Rotary, individual supporters, foundations, sponsors, and business, we can take Professor Good and his team to the brink of a clinical trial in an endemic country. During the difficult COVID 2020 year, we raised nearly $100,000.

PDG Graham Jones AM

INSIDE THIS ISSUE

MALARIA VACCINE PROJECT UPDATE

PROFESSOR MICHAEL GOOD AO

The laboratory team continues to make strong progress towards development of a 'whole parasite vaccine' employing killed parasites wrapped in a lipid membrane, which also contains special immunostimulatory molecules to help activate the immune system. Our novel vaccine approach aims to induce a cellular immune response to malaria – the induction of T-cells that will recognize all strains of the parasite. We are on track to commence a clinical study using this lipid-based vaccine this year.
The vaccine has proven highly effective in our animal models for malaria and furthermore it can be freeze-dried prior to use making it potentially very easy to deploy in all malaria-endemic areas of the world.

Given this is the first newsletter for this year, I thought I would remind readers a little of the biology of the parasite and the devastating consequences of infection. Malaria truly is a devastating disease for which a vaccine is urgently needed. The infection commences when an infected female Anopheline mosquito deposits malaria 'sporozoites' into the skin while taking a blood meal. These sporozoites travel throughout the body and those that reach the liver invade the cells of the liver (hepatocytes) and commence the first stage of their human expedition in that organ.

After about one week, the parasites have multiplied so that there are about 30,000 parasites in each infected liver cell. These rupture from the hepatocyte and invade red blood cells. Within the red cell, further reproduction leads to 16-24 new parasites per infected red cell over a 2-day period. There is exponential growth in the red blood cells until this process is stopped by an effective immune response or drugs. If untreated, a non-immune patient is at a high risk of severe disease or death due to anemia, cerebral malaria (infection of the brain), severe respiratory distress and organ failure.
Some parasites become committed to making gametocytes (male and female sexual forms) which remain inside the red blood cell.
These gametocyte-infected red cells are then taken up by a mosquito during her blood meal. Inside the mosquito gut the gametocytes leave the red cells and fertilize to start the next generation of parasites within the mosquito. These new parasites migrate through the insect's tissues to the salivary gland (where there can be up to 100,000 per salivary gland) – ready to be injected into the next person to be bitten. It is a complex life cycle and at each step the parasite has developed ways to avoid detection by the immune system. However, our approach to a vaccine is to induce a very novel type of immune response and our data show that the parasite is not good at avoiding these vaccine-induced immune responses.

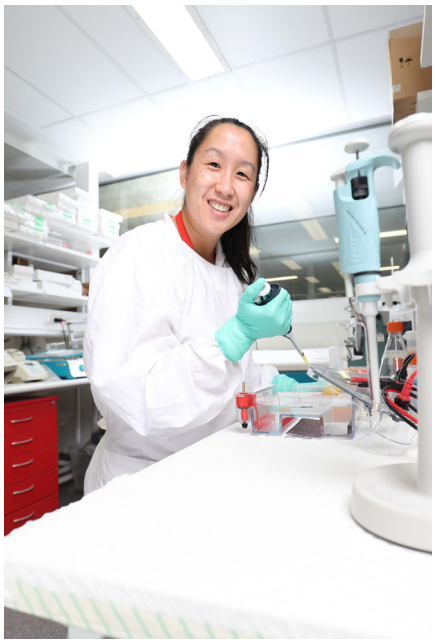
This issue of the Newsletter comes at a time when the world is experiencing its worst pandemic in 100 years, the first 12 months of which has resulted in the loss of over 2.6 million lives. As I write this article, it is exactly one year since WHO declared a pandemic. In that short period of time, the pace of development and licensing of novel vaccines for COVID-19 has been truly staggering. There are twelve vaccines that have been licensed for limited or full use, many of which are using technologies that have not previously been licensed for any vaccine. This pace is in stark contrast to the snail pace of malaria vaccine development, where RTS,S - a vaccine that induces only modest and very short term protection - remains the only vaccine for malaria that has moved beyond Phase III trials. It is currently in Phase IV trials in a small number of African countries. The difference in pace between malaria and COVID-19 vaccine development is due to the very different levels of funding that have been provided by the world's wealthiest countries to these diseases.

The data are not available to make a direct comparison between Disability Adjusted Life Years Lost (DALYs) for malaria versus COVID-19, but it is likely to be much higher for malaria as most of the 409,000 deaths for malaria occur in the first few years of life, whereas for COVID-19 they occur mostly amongst the elderly. Malaria simply does not attract the same level of interest from funders as does COVID-19.

Thus, the contribution of Rotary and of Rotarians to malaria is truly staggering and inspiring. If we are successful in our vision to develop a vaccine, a great deal of the credit will go to this wonderful organisation and its caring members.

BEHIND THE MICROSCOPE LENS

Ms Mei Fong Ho - Senior Research Assistant



The Road to 'Good'

I moved from Perth to Brisbane at the end of 2003 and worked in infectious disease research including Group A Streptococcus, scabies and malaria over a 10 year period. In 2015, my strong desire to be involved in clinical trials, and potentially a world changing vaccine, has led me to Professor Michael Good at Griffith University's Institute for Glycomics. I was promoted to Senior Research Assistant 3 years later.

Career History Highlight

My undergraduate studies were in molecular biology and throughout my career specialising in the area of PCR (polymerase chain reaction). This is a very sensitive technique that allows the detection of very small amounts of DNA in different sorts of samples eg blood samples. With my previous experiences in clinical trials and malaria, a position presented itself in this laboratory and I transitioned enthusiastically into this research.

"In 2015, my strong desire to be involved in clinical trials and potentially a world changing vaccine, has led me to Professor Michael Good at Griffith University's Institute for Glycomics"

Mei Fong's Role in this Intricate Puzzle

The malaria laboratory consists of eight personnel, including two students. All have different areas of expertise and are working on the development of an effective malaria vaccine. My responsibilities have expanded from applying the PCR technique to test for malaria parasites in blood samples from our human clinical trials to supervising, conducting and implementing new experiments in our pre-clinical vaccine studies. The focus involves developing an effective whole parasite malaria vaccine. It is exciting when pre-clinical studies show that the vaccine that is working. In tandem, we like to optimise the vaccine to improve effectiveness by investigations into why or how it works.

The Driving Factor

I started out studying cancer and thought it would be ideal to continue this, but after arriving in Brisbane and starting my first job in infectious diseases, my views have changed. It was apparent that diseases and cancers that were in the spotlight, received the most support. Learning about malaria and the devastation it causes fuelled my fire to join the research team and bring a vaccine to fruition for the good of health, globally.
It's a hard ask, but not impossible, I would love to be involved in finding a vaccine and this is what motivates me everyday.

Other Interests

Aside from all the hard work to achieve my career goals, I like to keep my mind and body active with aerials, self defence and fitness classes. I also like to indulge in movies, tv shows and where possible, food festivals.

INSPIRATIONAL SUPPORTERS

Vince and Barbara Rehbein

While on a Rotary FAIM project in 1978 I contracted malaria. We were building some school buildings at the remote village of Araimiri in Papua. To get to the village required a flight from Port Moresby to Kerema on the Gulf of Papua. We then crossed the Kerema River (4km) in a 6m dugout canoe with an outboard motor on the back, followed by a 20km ride in a trailer pulled by a tractor along the beach to the village. It was a precarious ride with the front wheel of the tractor only loosely connected to the steering! Materials for the project had been dropped into the sea off the village and floated ashore and gravel for the concrete was made by a villager smashing pieces of coral with a pipe. However the two buildings we erected were magnificant and I am proud to say it appears they are still in use.

There was a wild bull in the jungle outside the village and with the approval of the villagers, we caught it and slaugertered it. There was enough meat for the people of Araimiri and for several surounuding villages as well. However, to corral the bull we had to chase him through the jungle which was peppered with mosquitoes. I am pretty sure that is where they got me! Although I was diligent in taking my anti-malerial tablets I discovered on returning home that I was infected with a new strain of the parasite.

A week or so after my return I started to experience the symptoms and visited my GP who said,"If you have been taking your meds you can't have malaria". His confidence was not well founded as the blood test proved positive for Falciparum. I spent a week or so in the Mater in Brisbane where I was pretty sick and they had to take me off quinine because of a reaction.
My GP said, "That is great you've survived Falciparum. Many don't -it is all over". However a week or so later I had "the sweats" again. My GP was amazed as this test confirmed Vivax! The effects went on for a couple of years with the attacks gradually abating. When I had an attack I was advised to go straight to a clinic on Wickham Terrace and I remember one day sitting in the summer sun, outside the clinic waiting my turn, yet shivering with a blanket over me. An old "digger" walked past and said, "I know what you've got young fella".

So you can see why Barbara and I have been enthusiastic supporters of the wonderful malaria vaccine research undertaken by Professor Michael Good, Dr. Danielle Stanisic and their team at Griffith University. When Graham Jones called me four years ago to say he needed some funds to purchase a "blood separator" for Dr. Stanisic's research I was all in: "How much do you need?". My Rotary club (Broadwater-Southport) subsequently invited Danielle to speak to us about her work.

Since then Barbara and I have been regular and enthusiastic supporters of the Malaria Vaccine Project as we understand what a vaccine would mean for people in Africa, PNG,Indonesia and the Solomon Islands

Pregnancy and the parasite

Malaria in pregnancy (MiP) is a major public health concern in malaria endemic areas. Pregnant women are more susceptible to malaria infection and symptomatic malarial disease than non-pregnant women. This increased susceptibility is seen most commonly in the first pregnancy and declines with subsequent pregnancies.

MiP results in placental malaria. A sub-set of malaria parasites are able to bind to special receptors in the placenta where they accumulate and sequester, resulting in a placenta that cannot function properly to support the developing foetus. During the first pregnancy, women will develop an immune response to these placental-binding malaria parasites which will decrease her risk of developing MiP during her next pregnancy.

MiP can result in a number of poor outcomes for the mother and her offspring, including maternal death, maternal anaemia, pre-term delivery, miscarriage, and stillbirth. The placental infection can also result in foetal growth restriction leading to low birthweight (LBW) of the infant. LBW is associated with infant death, increased life-long susceptibility to illnesses and poor developmental outcomes.

In 2019, approximately 12 million pregnancies were exposed to malaria infection, mainly in Africa. Annually it is estimated that MiP results in approximately 900,000 children with LBW and up to 10,000 maternal and 200,000 infant deaths.

Current control measures for MiP include the use of insecticide-treated bed nets and intermittent preventive treatment in pregnancy (IPTp), which involves administering regular doses of effective anti-malarial drugs during pregnancy. Unfortunately, the malaria parasite has now developed resistance to some of the drugs that are commonly used for IPTp. Some of these anti-malarial drugs are also not recommended for use during the first trimester of pregnancy (up to week 12); women are susceptible to MiP during this time.

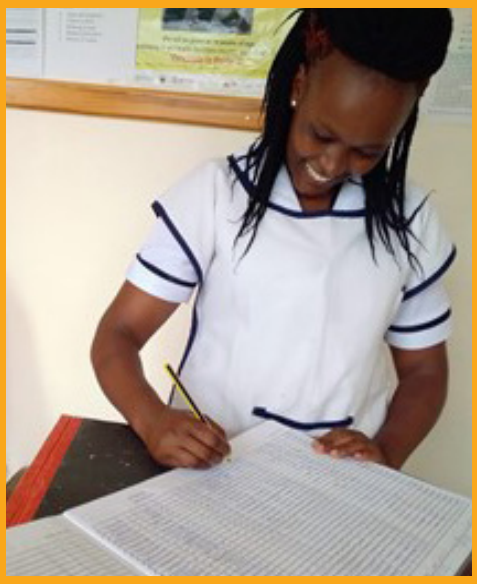
A number of research groups are now working on vaccines that will specifically target these placental-binding malaria parasites.

These vaccines aim to induce an immune response that will block the parasite from binding to the placenta.

Two MiP vaccine candidates, PAMVAC and PRIMVAC, have been tested in early Phase I trials in non-pregnant women.

For safety reasons, early vaccine trials are not conducted in pregnant women. These vaccine candidates were shown to be safe and induce an immune response. Future trials will focus on optimising these vaccine candidates so that they can induce a broad immune response and be effective against different strains of placental-binding malaria parasites.

Dr Danielle Stanisic
Associate Research Leader



ON THE MALARIA FRONTLINE

The following story sets out the experiences of Sr Margaret, a member of the Dimesse Sisters. She is also a nurse now living in Nairobi who has cared for malaria patients in Kenya.

In Kenya, we have the five malaria Plasmodium species and Plasmodium Falciparum which causes the greatest number of malaria cases and is fatal especially if not treated early. The most affected areas in Kenya are along the coastal and western region. During the short rainy season, we have few cases in the semi – arid low lands.

I have often worked in the semi-arid areas with few cases of malaria infections. The most painful thing was that most of the people I cared for who were suffering from malaria were children, ranging from neonates to 5 years of age. The rest of the population were less in numbers. The very common signs and symptoms that they presented with were high fevers that often caused convulsions, brain damage, vomiting, general malaise and headaches.

In severe malaria cases, patients also experienced anemia and at times, when the liver was infested heavily with the plasmodium, patients presented with jaundice and an enlarged liver. Sometimes I had cases of stillbirths and mothers carrying difficult pregnancies due to malaria complications.

The health facility that I have been working in serves a population of people from interior rural villages, where people have to walk as many as 100 kilometers through the bush, since they have no means of transportation. Its due to this reason that often, by the time they reached our facility they were already very sick with severe malaria.

Some patients suffered with cerebral malaria due to the heavy invasion of plasmodium falciparum that often caused death. It also occured because most of the patients needed admission and the nearest hospital was about 50km away with poor means of communication and financial constrains due to poverty.

The effects of malaria have been quite demanding on families due to the fact that quite often when one member of the family gets it, others too get infected since the female Anopheles mosquito carrying the plasmodium will definitely bite many more members and spread the malaria. Often times they experience deaths of their dear ones and heavy financial demands especially for admission in the hospitals.

In cases where a patient is in need of blood, it is often urgent since it is between life and death and the family members have to donate blood for their patient. It is very demanding in terms of finance and there is a lack of people who qualify for donation of blood due to poor nutrition and hence low blood levels.

In as much as I talk of how I have cared for people suffering from malaria, it is also worth mentioning that, I too have had episodes of malaria attacks. Twice in Kenya, I have suffered with plasmodium falciparum. The last bout was in 2004 while I was undergoing a course in Zambia. The worst of it was that I had plasmodium falciparum and plasmodium vivax. It was a very bad experience whereby I was comatosed for three days and in need of a blood transfusion. They did the best they could since I was in great danger and managed to save my life. It took me a full month before I was able to resume my normal life.

It will be therefore very good news if a vaccine is available to prevent the spread of malaria, which is one of the fatal diseases in most parts of Africa. This will improve the lives of people. Malaria has been one of the killer diseases in Africa and so if a vaccine is found it will reduce the mortality rate especially of the children and vulnerable adults.

Sr. Margaret Nderitu
Dimesse Sisters
Nairobi

Ron Borland looking into the microscope in the lab

CASH FOR REFUNDABLE CANS AND BOTTLES SUPPORTING THE MALARIA VACCINE PROJECT

MERMAID BEACH ROTARY CLUB COUNTING CHANGE FOR RESEARCH

With change in sight using change in hand, Mermaid Beach Rotary Club have taken community fundraising to the next level. As a simple, yet highly effective way to raise money for the Malaria Vaccine Project, it is an initiative that all members (and the community!) can partake in.

Get involved by chatting with your network of neighbours, friends, taverns, restaurants and anyone else that may be disposing of refundable cans and bottles. The project committee will collect from members who are unable to or do not wish to take the containers to the cash for containers depots.
The club has an account number at the recycling centres, crediting cash directly to the nominated account for convenience.

Cliff Harmsworth, President of Mermaid Beach Rotary Club is enthusiastic about this fundraising initaitive and believe we can all make a difference, one can or bottle at a time.

Having previously donated $5,000 to the Malaria Vaccine Project, Mermaid Beach Rotary Club intends on matching (or beating) this contribution and need your help to 'make it happen'.

For more information on how you can help, contact:
clifford.harmsworth@bigpond.com
Cliff Harmsworth
President
Mermaid Beach Rotary Club

Bin in driveway for residents to use

Robert Mensah, Ron Borland (holding Benji) and Cliff at Institute for Glycomics

Bottles loaded for the collection depot by Colin Welch, Community Services Director

AN EVENTFUL 2021 AHEAD

ROTARY SUPPORTS THE MALARIA VACCINE PROJECT

TEEING OFF FOR A MALARIA FREE FUTURE

Hope Island Rotary Club
Annual Charity Golf Day

The Rotary Club of Hope Island's Charity Golf Day is an Annual Event held at "The Links" Hope Island. Great support for this most enjoyable day enables the Club to support selected beneficiaries including the Malaria Vaccine Project. Chairman PDG Graham Jones with his team are always enthusiastic in their participation on the day.

The Rotary Club of Hope Island has 5 members on the Malaria Vaccine Project Committee and are passionate with their support. At present the Club have donated over $36,000.

Hope Island Rotary Club
Black Tie Dinner
25 September 2021
Sanctuary Cove Golf Club
Beneficiary: Malaria Vaccine Project
https://www.facebook.com/RotaryHopeIsland

Surfers Paradise Rotary Club
Annual Race Day
23rd October 2021
Gold Coast Turf Club
The Event Centre (North Hall)
Beneficiary: Malaria Vaccine Project
htttp://www.facebook.com/rcsurferssunrise

Planning an event to support the Malaria Vaccine Project?
Have the details included in the next newsletter by emailing:
n.kristensen@griffith.edu.au

OUR PARTNERS

Rotary District 9640

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Institute for Glycomics
Queensland, Australia

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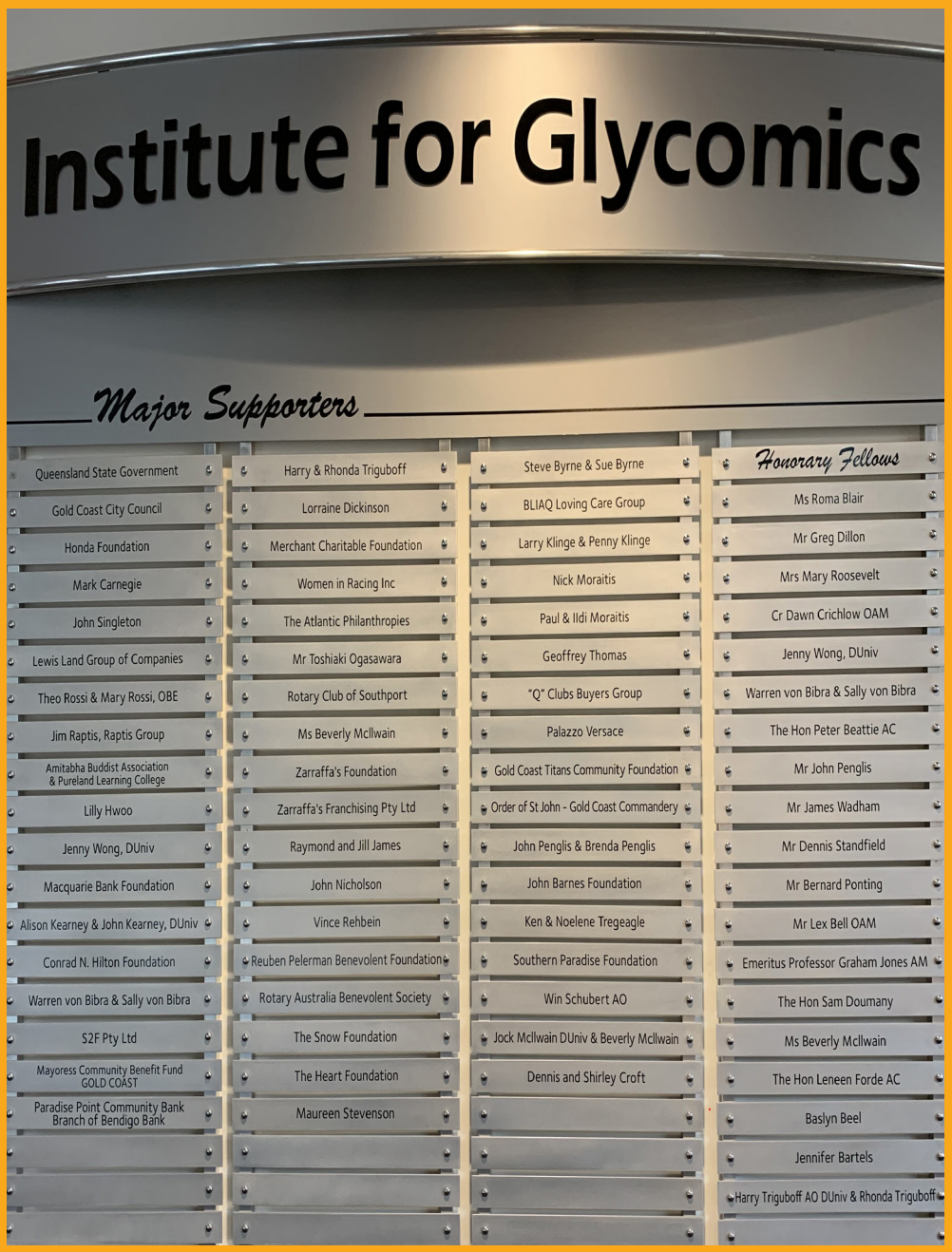
RAM
Rotarians Against Malaria

ZARRAFFA'S COFFEE®

MBA LAWYERS



WE'RE SOCIAL - JOIN US ON FACEBOOK!
Facebook.com/malariavaccineproject