The Chronic Kidney Disease in Africa (CKD-Africa) collaboration: lessons from a new pan-African network

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ABSTRACT
Chronic kidney disease (CKD) is a global public health problem, seemingly affecting individuals from low-income and middle-income countries (LMICs) disproportionately, especially in sub-Saharan Africa. Despite the growing evidence pointing to an increasing prevalence of CKD across Africa, there has not been an Africa-wide concerted effort to provide reliable estimates that could adequately inform health services planning and policy development to address the consequences of CKD. Therefore, we established the CKD in Africa (CKD-Africa) Collaboration. To date, the network has curated data from 39 studies conducted in 12 African countries, totalling 35,747 participants, of which most are from sub-Saharan Africa. We are, however, continuously seeking further collaborations with other groups who have suitable data to grow the network. Although many successful research consortia exist, few papers have been published (with none from Africa) detailing the challenges faced and lessons learnt in setting up and managing a research consortium. Drawing on our experience, we describe the steps taken and the key factors required to establish a functional collaborative consortium among researchers in Africa. In addition, we present the challenges we encountered in building our network, how we managed those challenges and the benefit of such a collaboration for Africa. Although the CKD-Africa Collaboration is focused primarily on CKD research, many of the lessons learnt can be applied more widely in public health research in LMICs.

INTRODUCTION
Chronic kidney disease (CKD) is one of the leading causes of morbidity and mortality, affecting 10%–16% of the general adult populations of Asia, Australia, Europe and North America1,2 with heterogeneous prevalence in African populations.3,4 The rising burden of CKD is evidenced by its climb in ranking of global causes of disability-adjusted life-years, from 29th in 1990 to 18th in 2019.5 Currently, more than 850 million people have kidney disease,6 with a disproportionate burden of this number affecting people in low-income and middle-income countries (LMICs) where access to care is significantly limited.7 In recent years, studies have shown that Africans are seemingly at a high risk for developing CKD,8 are affected at a younger age9 and have a more rapid progression to kidney failure.9,10 This disproportionate risk is partly attributed to the rapid epidemiological transition, culminating in a high and rising prevalence of hypertension and type 2 diabetes mellitus,11,12 combined with a high burden of infectious diseases13 and a genetic predisposition to CKD.14 Moreover, there are different methods used to detect kidney damage, which can influence the diagnosis and staging of CKD, and consequently the reported population prevalence.15 Due to the lack of data in many African countries, and the limitations in the available data,3,4 the true burden of CKD in Africa (epidemiological, including age-standardised rates, as
well as cost of care and health impact on patients, their family and society) is probably underestimated and thus remains largely unknown.

Recognising the shortfall, in 2018/2019, the Non-Communicable Disease Research Unit of the South African Medical Research Council (SAMRC) established the CKD in Africa (CKD-Africa) Collaboration. The major goal of this network is to pool data at the individual participant data (IPD) level from all relevant existing African studies. This will enable the burden of CKD in Africa to be determined more accurately, create resources for the burden of CKD to be easily tracked in future and for projections of CKD to be made in Africa. This would provide reliable estimates to develop policy solutions to address the consequences of CKD in Africa, inform health services planning, and aid the understanding of the mechanisms driving CKD across the continent.

Globally, several successful research consortia focus on communicable and non-communicable diseases, and various studies across Africa successfully employ the use of IPD. One example of a successful consortium using IPD is the CKD-Prognosis Consortium (CKD-PC), established to compile and analyse the best available data on kidney disease and clinical outcomes. This consortium has made a significant contribution to the definition, staging and management of CKD. However, despite the large number of participating cohorts globally, the CKD-PC has no data from Africa and thus there are uncertainties around using its findings to inform CKD management and prevention strategies in Africa.

This Practice contribution will introduce the CKD-Africa Collaboration, through describing the steps taken to establish the collaborative research consortium, as well as briefly summarising the current participating studies. Since few published papers currently exist detailing the challenges faced and lessons learnt in setting up and running a research consortium, we will present the challenges we have encountered and how they were managed. Also, we will report on the novelty and effectiveness of this kidney disease network in Africa.

CONCEPTION OF THE NETWORK

Establishing the CKD-Africa Collaboration, by moving the idea of an African network of studies on kidney function and CKD to a functional continental resource, required several steps. These included forming the central structure responsible for initiating and managing the network, identifying research partners, inviting these partners to join the network, and establishing the database platform, by acquiring and processing the participant-level data.

Identifying collaborators and setting up a functional database platform

Building a robust and sustainable collaborative research consortium requires identifying research partners. We found that a good way to identify potential partners was by first tapping into our existing research partnerships. Indeed, as the result of our cumulative existing networks as the central structure, we had access to IPD from cross-sectional studies for about 7000 individuals even before the first formal call for participation in the consortium was sent. Also, we found that forging new networks with researchers in the broader field of non-communicable diseases was beneficial. These new networks were mainly established at international conferences and events organised by specialty organisations, such as the European Society of Hypertension, the International Society of Hypertension, the European Renal Association-European Dialysis and Transplant Association and the International Diabetes Federation. We found that these in-person conversations, at conferences, were often useful when explaining the purpose of the network and discussing complicated issues (eg, security of data storage servers). These conversations also led to the development of personal relationships with our collaborators which we felt eased correspondence throughout the data sharing process. Further research partners were sought through the systematic search of published literature.

Search strategy

The reference list of the two most recently published systematic reviews of CKD prevalence in Africa was used as the basis to identify relevant studies, further supplemented by searches of Medline via PubMed, EMBASE, relevant African journals and WHO Global Health Library databases (which included the African Index Medicus, WHO Library Information System, and Scientific Electronic Library Online) to identify more recent publications. This comprehensive search strategy was developed using the African search filter and appropriate keywords, including “prevalence”, “incidence”, “screening”, “diagnosis”, “risk prediction”, “chronic kidney (or renal) disease”, “kidney (or renal) dysfunction”, “decreased kidney (renal) function”, “end-stage renal disease”, “glomerular filtration rate”, “albuminuria”, “proteinuria” “Cockcroft-Gault equation”, “Modification...
of Diet in Renal Disease equation”, “CKD Epidemiology Collaboration equation”, strung together by MeSH terms. Additional citations were also searched by scanning the reference lists of review papers and conference proceedings. Thus, to date, the searches covers the time frame from 1 January 1995 to 31 January 2021. The search results were uploaded into the citation management database EndNote (Clarivate Analytics, Philadelphia, USA), and the duplicate check function used to identify citations retrieved from multiple sources. Unique citations were uploaded into the systematic review software, Covidence (Covidence, Melbourne, Australia), used to store and track search results in the review process.

Process for selection of eligible studies
Using the Covidence software, two team members of the core working group (CG and SS) independently reviewed the articles referenced in the published systematic reviews and those obtained through the systematic search processes. In instances where either team member determined that a study may be eligible based on the title or abstract review, a full-text article review was conducted. Disagreements between reviewers, after full-text review, was resolved by discussion and consensus. There was no restriction on language since translators were available, if needed, to evaluate titles/abstracts and full-text articles. There was no language restriction on full-text language since translators were available, if needed, to evaluate titles/abstracts and full-text articles. Unique citations were uploaded into the systematic review software, Covidence (Covidence, Melbourne, Australia), used to store and track search results in the review process.

1. Studies of observational research design with a priori hypotheses and defined study objectives, participant-level information, and primary data collection.
2. Studies reporting, or allowing computation of, the prevalence of CKD. CKD could be defined based on estimated glomerular filtration rate (eGFR) and/or the presence of proteinuria/albuminuria, according to the Kidney Disease Improving Global Outcomes (KDIGO) guidelines. In the instance where eGFR is used to define CKD, investigators are required to report on the methods used to determine creatinine levels.
3. Studies with ethical approval from their respective ethics organisations, with deidentified data.
4. Studies with a minimum sample size of 300 participants for adult cohorts, aged 18 years and older. The justification for the selected sample size is that studies with small sample sizes are likely to include only few people with CKD, and consequently contribute little or nothing to the estimates in the meta-analyses, while remaining a major contributor to the heterogeneity across studies. Furthermore, we opted for participants aged above 18 years as the main aim of the consortium is to determine the burden of CKD and preventable risk factors driving the disease in Africa. The aetiology of CKD in children differs significantly from CKD in adults, with CKD in children generally caused by birth defects and hereditary diseases, whereas in adults the main drivers being diabetes and hypertension.
5. Studies with participants of African descent residing in Africa.

Our first formal call for participation was organised in 2018 (online supplemental addendum B), where corresponding authors of studies containing datasets that met the inclusion criteria were contacted via email, inviting them to contribute primary data for inclusion into the network. From our experience, obtaining data sets through personal contact took as little as 4 months, however, not all contacted authors responded initially. In instances of non-response, we attempted to make contact several times, with at least 6 months between calls. Since many collaborators may lack time or organisational resources to support essential data sharing tasks (eg, converting data to prespecified digital formats, drafting data sharing agreement), we found a useful technique to obtain the IPD was to minimise the additional responsibilities on the collaborator, like allowing datasets in any digital format. In addition to the non-responding investigators, we also experienced an unwillingness to participate in the network in a very limited number of cases. The main reason for the unwillingness was due to the studies not being completed at the time of our request.

After agreement to participate in the network, a memorandum of understanding (online supplemental addendum C), and in some cases, a material transfer agreement (online supplemental addendum D), was signed by both parties as a declaration of mutual understanding. These documents highlighted the role of the parties, the area of focus, ethical and data sharing information, intellectual property rights, commercialisation and publications. This agreement was followed by the electronic version of the data requested. In our case, we used the expanded version of the WHO STEPSwise Approach to non-communicable disease risk factor Surveillance (STEPS) Instrument as the basis for the scope of variables required (online supplemental addendum B). In instances where investigators are unwilling or unable to transfer data, owing to legal or other logistical reasons, but are prepared to reanalyse their data according to a standard protocol, the CKD-Africa Collaboration secretariat data centre produce a computer code that can be used to generate the required summary statistics. All deidentified data are held centrally at the SAMRC. To maintain the data integrity, protective measures are employed, which include the data being kept on a virus-protected and access-restricted server at the SAMRC,
which is backed-up daily. This storing procedure is as per the ‘Ethics in health research: principles, processes and structures’, second edition (2015) requirements for electronic data storage, which is the SAMRC’s Ethics Committee’s terms of reference.

The process of searching for collaborators, getting everyone on board, finalising the legal aspects of the arrangement and data acquisition is a lengthy and sometimes challenging process. However, it is laudable how generally able and willing investigators conducting CKD research in Africa have been to participate in this network. This shows the level of awareness of the devastating consequences of the disease among the African CKD research community and the desire to work collectively to address the problem. The process of data management is also a labour-intensive process. The data coding and transfer from original studies into the IPD database is done by a senior staff member, or by a student under supervision of a senior staff member of the central structure. During this process, participant characteristics and screening accuracy results for each study, using the cleaned datasets, are compared with those from the original datasets to identify any potential discrepancies.

In addition to obtaining the original IPD, aggregate data are extracted from the published articles of included studies. At this point, cross-checks between the published data with the original IPD obtained from each dataset are conducted and any inconsistencies discussed with the original authors. It is crucial to record and update contact information as this will ease subsequent communication, which often occurred years after the first data request was sent.

PROGRESS TO DATE

As of 1 April 2021, through our scoping efforts, we had identified 108 researchers who were the principal investigators (PIs) of 120 potential studies. Of these, 92 PIs were contacted to gauge their interest in collaborating in the consortium, as 16 PIs had either no author contact information or incorrect contact details. Of the 92 PIs contacted, 36 consented to participate in the network, with the remaining 56 PIs being either non-responsive to our call or, in two cases, unwilling to participate in the network. The consenting studies span across 12 African countries with a total of 46,276 participant-level data. To date, the network has successfully curated data from 39 studies conducted in 12 African countries, totalling 35,747 participants. Most enrolled studies are from sub-Saharan Africa, with one study representing north Africa25 (figure 1). Of the included studies, the number of participants range between 300 and 2,543 per study. Some studies are still undergoing enrolment, and therefore, the number of study participants continues to grow.

Of the participating studies (table 1), data collection of 14 studies (36%) took place before 2010,25–38 with the remaining 64% sampled between 2010 and 2017. Four of the participating studies have not been published yet.

![Figure 1](http://gh.bmj.com/) Distribution of African countries enrolled in the CKD-Africa Collaboration. The individual participant data (IPD) ranges from 300 participants to 12,247 participants per study. The nine shaded countries represent those for which IPD are currently available. The shading from light blue to dark blue represents the increasing number of IPD available per country, thus, the darkest shading represents the countries with the most available IPD. CKD, chronic kidney disease.

Overall, 79% of the IPD are from studies in the general population,29 30–34 36 37 39–50 7% are from studies of people with HIV-infection,27 29 51–54 6% from studies of populations with hypertension35 55 56 and 4% consists of people with diabetes mellitus57 (figure 2). The final 4% of the IPD constitutes two studies in patients with kidney failure26 58 and one study conducted in first-degree relatives of people with CKD.25 Of the 25 studies conducted in general populations, 88% (n=22) are geographically defined cohorts, with two of the remaining studies conducted among teachers recruited from primary, secondary and intermediate public schools30 39 and one study (not yet published) conducted in undergraduate students. The participants in the high-risk subpopulations were recruited from outpatient diabetes, hypertension and HIV clinics.

Most studies included adults in a broad age range, with the included cohorts comprising adults between the ages of 18–100 years. One unpublished study from Nigeria included only undergraduate students and therefore selected individuals in the age range 18–30 years. All studies recruited both male and female participants, with most having greater female participation. All, except one study used serum creatinine to estimate GFR and characterise CKD, with 76% additionally determining the presence of albuminuria or proteinuria. Only one study satisfied the 3-month chronicity criterion for diagnosing CKD.56 

All the studies include participants with normal kidney function and mild-to-severe stages of CKD (CKD stages 1–4), with 32% not having participants in the most severe stage of kidney failure (stage 5 CKD). All included studies used standardised creatinine assays, with the Jaffe method59 being the most commonly used method for determining serum creatinine concentration. Three of the 38 studies44 48 50 used enzymatic methods to determine serum creatinine concentrations. All studies have data on...
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potential confounders of the associations between kidney function and outcomes including, but not limited to, age, ethnicity, smoking, medical history and treatment, and comorbidities like diabetes mellitus, hypertension, and obesity.

Given the timeframe, we have made considerable progress in establishing the consortium, with included studies covering a fair proportion of Africa.

**EXPANDING THE CONSORTIUM**

As a means of strengthening the network we plan to engage with the African Renal Association and the International Society of Nephrology’s Africa Regional Board, to form a broader platform which would assist in calls for funding for this project as well as funding of needed prevalence studies in the rest of Africa not yet represented in the consortium. Also, we have scheduled a process of updating our systematic search process to identify new studies every 6 months, as a means of expanding our database. Expansion of the consortium is indeed important to obtain a representative group of study participants and sufficient statistical power for the results to be meaningful, but we are cautious to not stretch resources too thin and risk failure of the project. We also recognised early on that a balance needed to be struck between awaiting adequate IPD to generate sufficiently powered evidence and getting this evidence out to policymakers and other researchers; bearing in mind that potential collaborators and funders are more likely to join and fund a successful consortium.

Interested research groups working in the field of CKD are welcome to join the network, by contacting the
Funding

There are more financial constraints in LMICs than in affluent high-income countries (HICs). Foreign funding for conducting research in Africa is sparse, so having partners from HICs could help acquire important resources for the consortium. Besides funding from the South African National Research Foundation, our research efforts have yet to receive major funding. However, there are concerted efforts being made to attract funding from various sources, with the purpose of the funding geared at (1) capacity development, by attracting and supporting junior African researchers to undertake their postgraduate and postdoctoral projects using the consortium as basis; (2) popularising the work of the consortium, through a website, and workshops and (3) database maintenance.

NOVELTY AND EFFECTIVENESS OF THE CKD-AFRICA COLLABORATION

There is a significant demand for research to direct and strengthen policies related to non-communicable diseases, in particular CKD research in Africa. This network is thus in the ideal position as we aim to provide evidence that could inform health services planning and shape policy and guidelines in Africa and drive the agenda for expanding CKD research. This would inevitably result in improved care for the vulnerable and most affected populations on the continent. The consortium is an ideal platform that will serve as background for future studies in which it is expected to play a major role. Indeed, this platform will allow for discussions centred on standardisation of approaches, related to study design, kidney function measurements and estimating prevalence, enhancing the interpretability of analyses, and integrating data from multiple cohort studies. Our work will create a forum for sharing analytical methods and enhance funding opportunities allowing for the development of ancillary studies using standardised methodology. Further, the potential to combine study data across the network will enhance the ability to examine multiple health outcomes related to CKD, in addition to the ability to report more accurate estimates on the burden of CKD across Africa. This will be used to inform prevention, detection and control strategies at a regional level. Through the evidence generated by the consortium we aim to actively engage policymakers to prioritise CKD reduction. Another major advantage of the large data capacity expected through this collaborative endeavour, is that this consortium could support the training of Masters students and Doctoral fellows across Africa. The consortium will also provide an opportunity for further research capacity training and networking for investigators across Africa.

IPD meta-analysis, which is the primary methodology used by the CKD-Africa Collaboration, has major advantages above those of a conventional meta-analysis. Therefore, given the controversies surrounding the use of the various equations for estimating GFR to diagnose CKD, an IPD meta-analysis will provide standardised estimates across studies. Given the larger sample size through combined studies, IPD meta-analysis will also allow the performance of subgroup analyses (eg, by region, by country, epidemiological transition and over time), which would otherwise not have been possible by any primary study. Further, while there is little opportunity to check for biases from published aggregate data, IPD can be checked for missing, invalid, out-of-range and inconsistent datapoints in the datasets, before incorporating these into the larger merged dataset. Therefore, rather than implementing conventional meta-analyses, we seek opportunities to combine primary data from different groups to implement joint analyses, given the many commonalities between participating studies that will facilitate comparative research. By providing more detailed and reliable results, IPD meta-analyses offer greater potential than aggregate-data meta-analyses to impact on study design, conduct and analysis.

Naturally, this collaborative endeavour has both strengths and limitations. The variation in populations is one of the strengths of this network. Given the distribution of studies across Africa, the populations are genetically distinct, which will provide insights on possible genetic determinants of CKD. Furthermore, these populations also differ greatly with respect to health behaviours, healthcare delivery and environments. Conversely, while commonalities in study design will facilitate joint analysis, inconsistencies in the definition and capture of variables, as well as adjudication of outcomes, can complicate analyses. For example, the Jaffe method is less expensive and more readily used in the included studies compared with enzymatic assay but is more susceptible to interference from various biomolecules, like glucose. However, despite the lack of standardisation of measurements of common laboratory parameters, calibration may be achieved by statistical means, given detailed descriptions of the collection processes. Also, this network can provide a unique opportunity to improve the quality of creatinine measurements by examining External Quality Assurance data of participating laboratories and encouraging those laboratories that are not participating in such programmes to do so. This allows for peer comparison and to ensure that methods being used are traceable to an internationally recognised standard. This will allow for greater precision and accuracy of eGFR measurements and permit comparisons. We do acknowledge that a single time point for serum creatinine determination for CKD diagnosis by eGFR, rather than over 3 months as recommended, is not ideal. However, given the resource-poor settings in most of Africa, the probability of receiving data on repeated measures is low. Another limitation is the potential risk of participant duplication, where the same individual participates in different studies. Since we receive deidentified data, the various collaborators will...
CONCLUSION
This network will aid research in the field of CKD on the African continent. With this platform to facilitate interactions among active investigators, the commitment of all teams currently involved and the broadly defined research agenda, we are confident that there will be new studies across Africa, particular in the currently under-represented countries, that will join the network. In addition, we foresee the development of new studies originating from this collaboration. In that regard, this network has far-reaching potential for Africa, as it is in an ideal position to validate findings across geographical and national boundaries, to test hypotheses and to generate a new understanding of CKD progression and its complications. Although the CKD-Africa Collaboration is focused primarily on CKD, many of our lessons learnt can be applied more widely in public health research in LMICs.

Author affiliations
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Collaborators T A Adeleji; C Ayemang; A Akinsola; D D Alaola; O E Ayodele; E J Beune; P Bovet; J Calhoul; D R Chadwick; S P Choukem; S A Daad; M R Davids; M H Ekta; R T Erasmus; J Fabian; J A George; Z Gouda; H Grosskurth; R Kalyesubula; S Kapiga; F F Kaze; R Kruger; L Lammertyn; T E Matsia; C M C Mels; O C A Okoye; R Olyombo; C Osaf; N Peck; N Peer; R O Phillips; Y R Raji; M Ramsay; B Rayner; A A Salawu; A E Schutte; I Sainabuya; J W Stanifer; R Wanyama.

Contributors CG, SS, IO, MW and APK, who formed the core Writing Committee, contributed to the preparation of the manuscript. All collaborators were sent the manuscript as prepared for submission and given the opportunity to comment on the draft manuscript. The Writing Committee accepts full responsibility for the content of this manuscript.

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Competing interests The members of the Writing Committee declare that they have no competing interests. No support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

Patient consent for publication Not required.

Ethics approval Ethical clearance was obtained from the SAMRCs Human Research Ethics Committee for the establishment of the consortium (reference: EC016-8/2017) and further ethical clearance are sought for individual projects pertaining to the consortium.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement The datasets depicted in this manuscript are available from the corresponding author of each primary study on reasonable request.

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REFERENCES
**GOVERNANCE**

The consortium will comprise the core scientific team, which includes, Dr Cindy George, Prof Ikechi G. Okpechi, Prof Mark Woodward and Prof Andre P. Kengne, along with additional office staff, including students and fellows. In addition, the principle investigators of the contributing studies and regional experts in the field of CKD will also be included in the scientific team.

*Dr Cindy George:* Senior Scientist in the Non-Communicable Diseases Research Unit (NCDRU) unit of the South African Medical Research Council (SAMRC). Dr George has a background in research related to non-communicable diseases (NCDs), particularly in African populations. She also has valuable experience in large database management, evident by her role in collating the database of the caregivers’ data of the Birth-2-Twenty study. In her role as project lead, she will oversee all day-to-day coordination of the consortium, thus monitoring progress on a day-to-day basis for all activities, monitoring progress against the baseline plans, managing risk and any issues as they arise as well as managing the overall configuration of the consortium.

*Prof Ikechi G. Okpechi:* Researcher in the Department of Medicine and Division of Nephrology University of Alberta, Edmonton, Canada and Specialist nephrologist and Professor in the Division of Nephrology and Hypertension at the University of Cape Town. As a nephrologist, Prof Okpechi has extensive expertise in the field of kidney diseases, in particular kidney disease in Africans. Furthermore, as a member of various national and international renal societies and associations, including the South Africa Renal Society (SARS), the Nigerian Association of Nephrologists (NAN), the International Society of Nephrology (ISN) and Steering committee member of the ISN Global Kidney Health Atlas (GKHA), Prof Okpechi has a far-reaching network in the field of CKD. He also has valuable expertise in setting up and successfully managing consortiums and large cohort studies, which is evident in his role as principle investigator (PI) of the African Lupus Genetics Network (ALUGEN) consortium, and the South African Cape study on induction Therapy with Mycophenolic Acid or cyclophosphamide in patients with lupus nephritis (CAPTAIN Trial), as well as his role as co-PI in the Comparison of Three Combination Therapies in Lowering Blood Pressure in Black Africans (CREOLE) study. In addition to contributing this expertise to the consortium, Prof Okpechi will assist in overseeing set-up, development and execution of the consortium.
Prof Mark Woodward: Professor of Statistics and Epidemiology at Imperial College, London, UK. Prof Woodward is a global leader in the application of individual participant data (IPD) for research. He is a co-founder of many major IPD consortia including the global CKD-Prognosis consortium, the Asia-Pacific Cohorts Studies Collaboration, The Prospective studies collaboration, the Blood Pressure Lowering Trialist collaboration to name a few. Professor Woodward will bring this experience to the African setting. He also has considerable experience in Africa, having undertaken more than 20 development aid missions, including more than two years in Zimbabwe.

Prof Andre P. Kengne: Director of the NCDRU unit of the SAMRC and Professor at the Department of Medicine of the University of Cape Town. Prof Kengne has extensive experience on research relating to chronic diseases in Africa and globally. As a result, he has a far-reaching network, which is of significant importance to the consortium. He has great expertise in conducting large multi-centres/multi-national trials and collaborative studies. This is evident through his work as a member of the central coordinating team of the global Action in Diabetes and Vascular disease: PreterAx and DiamicroN MR Controlled Evaluation (ADVANCE) trial, he was also actively involved in the monitoring of the Asian Centres who took part in the Systolic Heart failure treatment with the If inhibitor Ivabradine (SHIFT) trial, as well as being involved in the pan-European EPIC-InterAct cohort study, which is the world's largest study of incident type 2 diabetes. He is also the secretariat for the Asia Pacific Cohort Study Collaboration (APCSC). The APCSC database now has data on over 650,000 participants from 44 separate cohort studies in mainland China, Hong Kong, Taiwan, Japan, South Korea, Singapore, Thailand, New Zealand and Australia. It is considered the largest epidemiological collaboration in the southern hemisphere and in the top five of the world's largest medical studies. He also leads the African working group of the NCD Risk Factor Collaboration (NCD-RisC), which currently includes nearly 80 investigators from across Africa and beyond. He is internationally known as a leader in the field of NCD research in developing countries. In his role as director of the consortium, he will oversee all activities relating to the development, execution and scalability of the consortium.

Office staff: The central office staff consists of students and fellows who (1) assisting Dr George with the development and maintenance of the network of collaboration, (2) assisting the core scientific team in identifying research opportunities, initiatives and advances, (3) assist in identifying and planning appropriate workshops and conferences, (4) scientific contributions to
the preparation and co-authoring kidney disease-related scientific articles and reports and (5) presenting research findings at national and international conferences.

* Principle investigators of the contributing studies: The consortium will appoint an executive committee of about 10 members in charge of overseeing the activities of the consortium. *
Dear ..............................................................(name of potential collaborator)

Re: Call for participation in the CKD-Africa Collaboration network

With this letter, we would like to extend an invitation to you to join the Chronic Kidney Disease in Africa (CKD-Africa) Collaboration, which is an initiative led by the Non-Communicable Diseases Research Unit of the South African Medical Research Council. This is a novel collaborative effort aimed at advancing evidence-based medicine within the field of chronic kidney disease (CKD) in the context of Africa.

As you are aware, CKD is a global public health problem, seemingly affecting African countries disproportionately. Unfortunately, due to the lack of data from various African countries or the limitations of available data, the burden of CKD in Africa is still unknown. Over recent years, there has been an increase in the number of reports on CKD prevalence across Africa; however, these studies remain largely underpowered, and taken individually cannot address the between-country variations and time trend in the prevalence of CKD. It is thus difficult to generalize the available evidence and to provide evidence-based recommendations. In order to overcome these limitations, we have established the CKD-Africa Collaboration, through which we will seek to address these limitations by collating data, at individual participant data (IPD) level, from existing African studies, in order to answer vital research questions related to the CKD burden. The goal of this collaboration is to create a formal platform for cooperation between researchers and cohorts that facilitates high-quality studies on the burden of CKD in Africa, with the strength of such a collective endeavor having far-reaching potential.

To date, the network has curated data from 39 studies conducted in 12 African countries, totalling 35,747 participants, and we are very interested in ............................................ (study of interest).

As a basis we use the WHO STEPS Instrument for data request, so we ask collaborators to supply data on the following variables (if they captured it in their studies):

1. **Demographic and general information**: Gender, age, level of education, employment, income (estimate of total household income), indicators of the study setting (rural vs. urban), variables reflecting the design (if complex design used)

2. **Behavioral measurements**: Tobacco use, alcohol consumption, diet and dietary salt intake, physical activity, personal and family history of (raised blood pressure, diabetes, raised total cholesterol, cardiovascular disease, chronic kidney disease), received lifestyle advise, list of chronic medication use (including traditional medicine)

3. **Past medical history**: Any previous dialysis treatment for acute kidney injury

4. **Physical measurements**
   - Blood pressure and heart rate, weight, height, waist circumference, hip circumference, blood glucose, blood lipids
   - Measures of kidney function: creatinine, urea, urinary albumin excretion (also urinary protein creatinine ratio), cystatin C
   - Measures of CKD impact: serum electrolytes (Na+, K+, Cl-, calcium, phosphates), haematological profile, serum protein,
   - Other biological markers: markers of inflammation (CRP, fibrinogen etc)
Kidney imaging (e.g. ultrasound of the kidney for size, echogenicity and corticomedullary differentiation)

Histology of kidneys (i.e. renal biopsy report)

We are aware of the enormous workload on primary investigators, therefore to keep the burden minimal we request electronic databases, including formats such as Excel, CSV, Dbase format, or formats of common statistical software, which would be accompanied by a library identifying variables. Thereafter, we will be in touch with you, regarding specific questions related to methodology, as we harmonies the datasets received. We would like to emphasis that the data you contribute to the consortium will remain your sole property. The data will thus only be used in combination with other data received and will not be shared with a third party. Furthermore, as a collaborator in this project, you will co-author all manuscripts in which your data was used and if you contribute a dataset with >500 participants, you can nominate an additional investigator, who will also join the consortium as a permanent collaborator. This information is documented in the memorandum of understanding that I have attached to this letter.

If you wish to participate or know of investigators who would be interested to participate, please feel free to contact us.

Kindest regards

Dr Cindy George,
Project Lead: CKD-Africa Collaboration
Non-Communicable Disease Research Unit, South African Medical Research Council, Parow, South Africa; Tel: +27 21 938 0482; cindy.george@mrc.ac.za

And,

Prof Andre Pascal Kengne,
Director
Non-Communicable Disease Research Unit, South African Medical Research Council, Parow, South Africa; Tel: +27 21 938 0841; andre.kengne@mrc.ac.za
MEMORANDUM OF UNDERSTANDING

in respect of research cooperation between the

SOUTH AFRICAN MEDICAL RESEARCH COUNCIL

a statutory science council established in terms of the laws of the Republic of South Africa,
situated at Francie van Zijl drive, Parow Valley, Western Cape, South Africa, herein represented
by Professor Glenda Gray in her capacity as President of the Council
(hereinafter referred to as “SAMRC”) through its
NON-COMMUNICABLE DISEASES RESEARCH UNIT herein represented by
Professor Andre P. Kengne in his capacity as Director of the Unit
(hereinafter referred to as “NCDRU”)

and

[Title, Full name of Collaborator] in his capacity as [Position]
[Address of Collaborators Institution]

the NCDRU and [Title, Full name of Collaborator] shall hereinafter be jointly referred to as the
“Parties”;
PREAMBLE

WHEREAS, the Parties recognise that due to a lack of data in various regions in Africa or the limitations of available data, the true magnitude of Chronic Kidney Disease (CKD) is not known. In recent years, there has been an increase in the number of reports on CKD prevalence across different regions in Africa; however, these studies remain largely underpowered, and taken individually cannot address the variations and time trends in the prevalence and determinants of CKD between countries.

And Whereas, the Parties recognise that cooperation among scientists, throughout Africa, would be critical in developing sustainable and regionally relevant solutions related to the burden of CKD. The Parties further recognise that the strength of such a collective endeavour has far-reaching potential:

(i) such as harnessing individual participant data (IPD) from numerous studies, conducted across Africa,
(ii) overcoming the small sample size of independent studies, thus increasing the statistical power;

The Parties agree that this collaborative endeavour is of particular importance as it will supplement the current knowledge on CKD by providing an updated and comprehensive synthesis of data on the magnitude of CKD in the African region.

Now therefore, the Parties intend to cooperate in accordance with the terms of this Memorandum of Understanding (MoU) and have reached the following understanding:

1. INTERPRETATION

1.1 Headings of clauses shall be deemed to have been included for purposes of convenience only and shall not affect the interpretation of this Agreement.

1.2 In this Agreement, unless inconsistent with the context, the following words and expressions shall have the meanings assigned to them hereunder:-

1.2.1 “Dataset library” means the document which needs to accompany the
dataset, listing the variables contained in the dataset, along with the definition and unit measure of each variable.

1.2.2 “Pooling” means combining the raw data received from various sources.

1.2.3 “Computer database” means electronic version of the pooled data which will be kept centrally, at the SAMRC’s, NCDRU in Cape Town, South Africa.

1.2.4 “Deidentified” means that the identifiable variables will be removed prior to submission of these datasets to the head office of the consortium.

**Article I – Role of Parties**

Subject to the terms hereof, [Title, Full name of Collaborator] agrees to contribute original data of at least 300 (three-hundred) participants, at IPD level, to the Chronic Kidney Disease in Africa (CKD-Africa) Collaboration, accompanied by the dataset library to facilitate pooling, which will happen centrally at the SAMRC, NCDRU. The deidentifed data will be held at the SAMRC, NCDRU, in Cape Town, South Africa, in a computer database in a secure facility, and in a manner that maintains participants’ confidentiality.

[Title, Full name of Collaborator] will act as the de facto member in the consortium and if data on more than 500 participants are supplied, an additional member can be invited to the consortium at the discretion of [Title, Full name of Collaborator].

**Article II – Areas of Focus**

The Parties intend to address the gap in knowledge related to the burden of CKD in the context of Africa.

In order to give effect to the above, the Parties shall endeavour to:

a) conduct scientific meetings, workshops and symposia for identifying priority areas/programmes of research, and capacity building activities.
the Parties intend to be responsible for their own costs, unless otherwise decided in writing, including travel costs for their respective employees participating in any activities pursuant to this MoU;

b) promote the exchange of technical expertise, and information;

c) publish scientific findings, organise training activities, hold consultations and engage in any other forms of cooperation identified jointly that would help in establishing and implementing research projects that will promote:

- the generation of research evidence to inform programme efforts and policy considerations e.g. disease surveillance and epidemiology, disease management strategies, implementation and operational research activities, etc.
- the creation of a knowledge platform to:
  - enhance rigour of research methodologies;
  - streamline regulatory hurdles; and
  - enhance scientific capabilities e.g. biostatistics, bioinformatics, health systems, manufacturing, grant management, etc.

**Article III - Non-Exclusivity**

The Parties understand that this relationship is not exclusive. In addition to the Parties, it is anticipated that there will be participation in the activities contemplated in this MoU by other entities. These entities will include individuals and institutions in the public, private and academic sectors, as well as state, provincial and/or local governments in all participating African countries, experts from other countries, international organisations, non-governmental organisations, etc.

**Article IV- Ethical Issues and Data sharing**

Both Parties acknowledge the importance of the protection of human participants in research. Both Parties warrant that they have adopted laws and regulations on the protection of human participants involved in research. Both Parties intend to undertake all activities contemplated in terms of this MoU in accordance with all applicable laws, regulations and policies of their respective countries.
The CKD-Africa Collaboration will be based on the principle that each Party will retain national ownership of their data. However, the Parties will give the NCDRU access to their data, which will not be shared with any third party.

Investigators should also share their findings with the relevant institutions articulating how the work informs policy and practice. The Parties shall encourage the investigators to put the data arising from the work into open access i.e. encouraging the sharing and access of data amongst the investigators and the research community as per the policies of the respective countries.

**Article V - Intellectual Property Rights, Commercialisation and Publications**

**Intellectual Property Rights**

a) The Parties shall ensure appropriate protection of any intellectual property generated from cooperation pursuant to this MoU, consistent with national and international legislation and agreements.

b) In case of research results obtained through joint activities, the ownership of intellectual property rights shall be sought by both the Parties. Once granted, these rights shall be jointly owned by the Parties and the investigators.

c) The Parties shall not assign any rights and obligations arising out of the intellectual property generated from interventions/activities arising under the MoU to any third party without the prior written consent of the other Party to this MoU.

**Publication**

a) The other Party to this MoU will act as co-author to all publications generated using data supplied by the other Party to this MoU. If the data supplied by the other Party is not used in a publication, the other Party will not be included as a co-author.
b) Any publication, document and/or paper arising out of joint work conducted by the Parties pursuant to this MoU must acknowledge both the SAMRC and the other Party to this MoU.

c) The use of the name, logo and/or official emblem of a Party on any publication, document and/or paper by the other Party shall require prior permission of the Party whose emblem will be utilised. It must however be ensured that the official emblem and logo of the respective Parties are not misused.

**Article VI – Final provisions**

This MoU is not intended to create any binding obligations under the laws of the Parties or under international law. Specific projects and activities under this MoU will be subject to the availability of personnel, appropriated funds and other resources. Any difference in interpretation of this MoU should be resolved by mutual discussion.

**Article VII – Term of this MOU**

This MoU is at-will and may be modified by mutual consent by the Parties.

This MoU shall become effective upon signature by the Parties and will remain in effect until modified or terminated by any one of the Parties by mutual consent. In the absence of modification to the MoU, the Parties mutually agree that this MoU shall be terminated once all publications have been published in peer-reviewed journals.

Either Party may discontinue cooperation in terms of this MoU at any time and shall endeavour to provide written notice to the other Party in this regard. Any existing arrangements/agreements in place pursuant to this MoU shall not be affected by such termination and shall be dealt with according to that specific arrangement/agreement.
For the [COLLABORATORS INSTITUTION]  

[Title, Full name of Collaborator]  
Prof Andre P. Kengne  
[Position]  
Director  

___________________________                  _______________________________
Place: ______________________  Place: __________________________
Date:_______________________  Date:___________________________

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MATERIAL TRANSFER AGREEMENT AND CONFIDENTIALITY AGREEMENT

made and entered into between:

The SOUTH AFRICAN MEDICAL RESEARCH COUNCIL, a statutory science council established and operating in terms of the South African Medical Research Council Act, No. 58 of 1991, herein represented by Professor Glenda Gray in her capacity as President of the Council,

through its NON-COMMUNICABLE DISEASES RESEARCH UNIT, represented by Professor Andre Pascal Kengne in his capacity as Director of the Unit

From: Office of the President, PO Box 19070, Tygerberg 7505, South Africa

(hereinafter “Receiving Party / Recipient”)

And

INSTITUTIONAL DETAILS

(hereinafter “Disclosing Party”)
PREAMBLE

Whereas each Party as a Disclosing Party has in its possession certain Confidential and/or Material relating to the Purpose;

And Whereas each Party as a Disclosing Party has agreed to disclose certain of this Confidential Information and/or Material to the Receiving Party subject to the Receiving Party agreeing to the terms of confidentiality set out herein;

1 INTERPRETATION AND DEFINITIONS

In this Agreement, unless inconsistent with, or otherwise indicated by the context:

1.1 The headings of clauses are intended for convenience only and shall not affect the interpretation of this Agreement;

1.2 Words in the singular include the plural and vice versa;

1.3 Words importing any one gender include each of the other genders;

1.4 A reference to a natural person includes a legal person;

1.5 “Parties” means the parties to this Agreement and “Party” shall mean one of them;

1.6 The “Disclosing Party” is the proprietor and/or owner and/or is lawfully entitled to and/or has a legal right to the “Confidential Information” and/or Material as defined below;

1.7 The “Receiving Party/Recipient” means either Party receiving any Confidential Information and/or Material from the Disclosing Party and shall include its members of staff, students and contractors;

1.8 “Confidential Information” shall include, but shall not be limited in its interpretation to all intellectual property, patents, copyrights, trademarks, inventions, utility models and like, rights, secret knowledge, and further means every other form of intellectual property right, which also includes any improvement(s), specialist technical information or expertise, data, material (including biological materials), organisms- as well as non-patentable inventions, irrespective of the way and manner of being published, or the way it is written or recorded whether it is captured on a computer, developed or created, as well as specifications, formulae, systems, methods, process, information, inventions, which means any invention that describes new and inventive and can be applied or implemented in agriculture or trade, as well as inventions described in the specifications of patents of/and applications for patents that is protected against any claims thereof and all rights that is internationally protecting, including, but without limitation, the right to obtain legal protection regarding that, in whatever form it is available, and patents, which mean all registered patents and/or applications to patents listed in the world, together with all rights to, in any other country in the world apply...
for such patent protection and/or receive such protection, technical information and specifications, manufacturing techniques, designs, circuit diagrams, instruction manuals, blueprints, electronic artwork, samples, devices, demonstrations, formulae, know-how, show-how, information concerning materials, marketing and business information generally, financial information and other materials of whatever description in which the Disclosing Party has an interest in being kept confidential;

1.9 “Commencement Date” means the date of signature of the party signing last;

1.10 “Material” means the material to be transferred, together with any parts or sub-units, descendants, progeny, mutants, mutations or other derivatives thereof, to the Recipient as defined in clause 6 hereunder;

1.11 “Dataset library” means the document that accompanies the Material document file, listing the variables contained in the Material document file, along with the definition and unit measure of each variable;

1.12 “Pooling” means merging the Material received from various sources;

1.13 “Computer database” means electronic version of the pooled data which will be kept centrally, at the South African Medical Research Council (SAMRC), Non-Communicable Diseases Research Unit (NCDRU) in Cape Town, South Africa;

1.14 “Deidentified” means that the identifiable variables related to the participants will be removed prior to submission of the Material to the head office of the consortium;

1.15 “Purpose / Project” means Material, data and information relating to [NAME OF THE STUDY]

NOW THEREFORE it is hereby agreed that:

2 OWNERSHIP OF THE CONFIDENTIAL INFORMATION AND ASSESSMENT

2.1 The Receiving Party acknowledges that all right, title and interest in and to the Confidential Information and/or Material vests in the Disclosing Party and that it has no claim of any nature in and to the Confidential Information and/or Material.

2.2 The Disclosing Party and Receiving Party specifically undertake, in the event of any new invention(s) that may be conceived or reduced during the conduct of and pursuant to the Project, to use their best endeavours to negotiate in good faith and with due regard to the relative contributions of each Party to such a new invention, a joint invention agreement, which agreement shall inter alia provide for, on an equitable basis, the sharing between them of new patent costs, the percentage of their respective ownership in such new patent(s) and their respective income and invention responsibilities, provided also that both Parties retain the right to commercialise independently of the other Party.

2.3 Confidential Information and/or Material disclosed under this Agreement shall at all times remain the property of the Disclosing Party. The Confidential Information will be used for
Not-for-profit research purposes only and in accordance with the terms and conditions of this Agreement.

2.4 No license or other rights in or to the Confidential Information and/or Material is granted by this Agreement or any disclosure under this Agreement except as provided herein.

2.5 This Agreement does not confer by implication *estoppel* or otherwise any license or other rights under any of the Patents, patent applications, Confidential Information, trademarks-and/or secrets, or other proprietary rights of either Party.

2.6 All Confidential Information and/or Material made available under this Agreement, including copies thereof, shall be returned to the Disclosing Party (or, upon such Party’s request or consent, destroyed) upon the first to occur of:

2.6.1 completion of the Purpose(s) set forth in this Agreement; or

2.6.2 at the request of the Disclosing Party; or

2.6.3 at the cancellation of this Agreement by any party without any reason.

2.7 The Receiving Party shall immediately report, in writing, to the Disclosing Party, any improvements and modifications that it might make to the Material and/or the Confidential Information. The Receiving Party shall promptly inform the Disclosing Party, in writing of any inventions, whether patentable or otherwise, resulting from the Receiving Party’s direct use of the Material and/or Confidential Information. In the event that the Disclosing Party elects not to seek patent protection on inventions conceived or reduced to practice using the Material, the Receiving Party shall have the right of first refusal to file patent applications on behalf of the Receiving Party for said inventions.

3 PERIOD OF CONFIDENTIALITY

3.1 The provisions of this Agreement shall remain in force for the duration of this Agreement and a period of three (3) years after the termination thereof.

4 NON-DISCLOSURE

4.1. The Receiving Party undertakes to maintain the confidentiality of any Confidential Information, whether the access thereto was granted before or after the Commencement Date of this Agreement. The Receiving Party will not disclose or permit to be disclosed to any person any aspect of such Confidential Information other than as specifically for the Purpose allowed in this Agreement.

4.2. The Receiving Party shall take all such steps as may be necessary to prevent the Confidential Information falling into the hands of an unauthorised third party.

4.3. The Receiving Party shall not make use of any of the Confidential Information in the development, manufacture, marketing and/or sale of any goods without the prior written consent of the Disclosing Party.

4.4. The Receiving Party shall not use or disclose or attempt to use or disclose the Confidential Information for any purpose other than as intended herein.
4.5. The Receiving Party shall not use or attempt to use the Confidential Information in any manner which will cause or be likely to cause injury or loss to the Disclosing Party.

4.6. The Receiving Party shall by written notice to the Disclosing Party specify which of the Receiving Party’s employees, officers or agents will have any access to the Confidential Information and those individuals whose access are approved by the Disclosing Party shall sign this agreement or a copy hereof in acknowledgement that they are also in the individual capacity bound by the terms and conditions of this agreement. In addition, the Receiving Party shall be jointly and severally liable for any breaches of such individuals of any provision contained herein.

5  EXCEPTIONS

5.1 The rights and obligations agreed to in clause 4 above shall not apply to information which:

5.1.1 is in fact lawfully in the public domain available at the Commencement Date; or

5.1.2 lawfully comes into the public domain after the Commencement Date otherwise than as a result of the conduct of the Receiving Party or one of its employees or agents; or

5.1.3 the Receiving Party is obligated to produce as a result of an order by a court, judicial or administrative authority or pursuant governmental action, provided that the Disclosing Party shall have been given prior written notice of such court order, governmental action and opportunity to appear and object, or

5.1.4 The Receiving Party obtains from a third party not under any confidentiality obligation to the Disclosing Party respecting such information, or

5.1.5 The Receiving Party at the time of disclosure already has in its possession and in which is not subject to any obligation of secrecy on their part, to the other party, or

5.1.6 The Receiving Party can prove from its records to have been independently generated and/or developed by it without reference to any information it has received pursuant of this Agreement.

5.2 The onus of proving the facts necessary to sustain any one of the exceptions listed in subparagraphs 5.1.1 to 5.1.6 rests with the Receiving Party.

6  TRANSFER OF MATERIAL

6.1 This agreement concerns the following deidentified Material to be provided to the Recipient only if captured in the [Name of study]:

6.1.1 Demographic and general information, including gender, age, level of education, employment, income (estimate of total household income), indicators of the study setting (rural vs. urban), variables reflecting the design (if complex design used),

6.1.2 Behavioural measurements, including tabaco use, alcohol consumption, diet and dietary salt intake, physical activity, personal and family history of (raised blood pressure, diabetes, raised total cholesterol, cardiovascular disease, chronic kidney
6.1.3 Past medical history, including any previous dialysis treatment for acute kidney injury,

6.1.4 Physical measurements, including blood pressure and heart rate, weight, height, waist circumference, hip circumference, blood glucose, blood lipids,

6.1.5 Measures of kidney function, including creatinine, urea, urinary albumin excretion, urinary protein creatinine ratio, cystatin C,

6.1.6 Measures of chronic kidney disease impact, including serum electrolytes (Na+, K+, Cl−, calcium, phosphates), haematological profile, serum protein,

6.1.7 Other biological markers, including markers of inflammation (high-sensitivity C-reactive protein (hsCRP), fibrinogen, or other biological markers measured),

6.1.8 Kidney imaging, including for example ultrasound of the kidney, echogenicity and corticomedullary differentiation,

6.1.9 Histology of kidneys, including renal biopsies.

7 THE RESEARCH PROJECT

7.1 The manner in which, and the extent to which the Material may be used by the Recipient are as follows:

The deidentified Material, obtained from [Collaborators’ institution] will be merged with the existing database from other contributing studies. The merged database will be used in the analysis to answer research questions; which will be predetermined by the core research group.

7.2 In the framework of this Agreement, the Parties may transfer Material to one another, which transfer shall be subject to the conditions of this Agreement. Parties shall list such Material also as Annexure to this Agreement and shall keep the Annexure up to date after each transfer of Material.

7.3 The Receiving Party shall utilise the Material solely for the conduct of the Project and shall in no case seek or have any person or corporate body seeking any commercial use of the Material or any other material that could not have been made but for the Material, unless explicitly agreed upon in this Agreement.

7.4 The Receiving Party shall not transmit by any means whatsoever all or part of the Material to any third party without the prior and written consent of the Disclosing Party.

7.5 The Receiving Party shall ensure that the importation, transport, use, maintenance and disposition of the Material will be conducted in strict accordance with and in compliance...
with all laws and regulations both local, nationally and internationally, including regulations for work with recombinant Material.

7.6 In the event where human tissue or products of human origin are implied by this Agreement, the Parties undertake to comply with the regulations related to human tissue or products of human origin, as enacted in the RSA Act on Human Tissue 65 of 1983, as amended and/or any other relevant act(s) and/or regulation(s) and in this regard to get the necessary approval from the Ethics Committee of either and/or both Parties, prior to the transfer of such human tissue or products of human origin.

8  PUBLICATION RIGHTS

8.1 In the framework of this Agreement, the *defacto* member/s of the Disclosing Party will act as co-author/s to all publications generated using Material supplied by the Disclosing Party. If the Material supplied by the Disclosing Party is not used in a publication, the *defacto* member/s will not be included as a co-author.

8.2 Any publication, document and/or paper arising out of joint work conducted by the Parties pursuant to this contract must acknowledge both the Disclosing Party and the Recipient.

8.3 The use of the name, logo and/or official emblem of a Party on any publication, document and/or paper by any Party shall require prior permission of the Party whose emblem will be utilised. It must however be ensured that the official emblem and logo of the respective Parties are not misused.

9  WHOLE AGREEMENT

9.1 This document constitutes the whole of this Agreement to the exclusion of all else.

9.2 No amendment, alteration, addition, variation or consensual cancellation of this Agreement will be valid unless in writing and signed by both Parties hereto.

10  WAIVER

10.1 No waiver of any of the terms or conditions of this Agreement will be binding for any purpose unless expressed in writing and signed by both Parties and any such waiver will be effective only in the specific instance and for the purpose given.

10.2 No failure or delay on the part of the Disclosing Party in exercising any right, power or privilege will operate as a waiver, nor will any single or partial exercise by the Disclosing Party of any right, power or privilege preclude any other or further exercise thereof or the exercise of any other right, power or privilege.

11  SEVERABILITY
11.1 In the event that any of the provisions of this Agreement are found to be invalid, unlawful, or unenforceable such terms shall be severable from the remaining terms, which shall continue to be valid and enforceable.

12 NON-EXCLUSIVITY

12.1 Nothing in this Agreement shall be deemed to constitute or imply that the Disclosing Party grants any licence, immunity or intellectual property rights to the Receiving Party or that the Disclosing Party is obliged to enter into any further Agreements with the Receiving Party.

12.2 It is explicitly agreed upon by the Parties that the provision and disclosure of Confidential Information from the Disclosing Party to the Receiving Party is non-exclusive as the Disclosing Party, in his sole discretion, is entitled and free in any manner it chooses to act with Confidential Information in any way the Disclosing Party sees fit, and whatever the decision, including the disclosure of Confidential Information to any third party for any other similar reason, is in the sole discretion of the Disclosing Party.

13 BREACH

13.1 If a party to this agreement (“the breaching party”) breaches any material provision of this agreement, the other party (“the aggrieved Party”) shall be entitled to deliver to the breaching party a written notice requiring the breaching party to rectify that breach within 30 days of receipt.

13.2 If the breaching party remains in breach of such provision within 30 days after receipt of the notice, the aggrieved party shall be entitled (without derogating from any of its other rights or remedies under this agreement or at law)

13.2.1 To sue for immediate specific performance of any of the defaulting party’s obligations under this agreement, whether or not such obligation is then due, or

13.2.2 To cancel this agreement, in which case written notice of the cancellation shall be given to the defaulting Party, provided that the remedy of specific performance or damages would not adequately prevent the aggrieved party from being prejudiced.

14 WARRANTIES AND INDEMNIFICATION

14.1 Each Party agrees to indemnify, defend and hold harmless the other Party and its directors, employees, researchers and students against any and all claims of or liabilities to third parties, including fees, expenses and costs of claims and suits for any such third parties loss, damage, injury, or loss of life, if such claims or liabilities arise directly or indirectly from the omission or performance of the indemnifying party’s rights or obligations arising out of this Agreement. A Party is released from this obligation as far as the aforementioned is
caused by gross negligence or malicious intent of the other Party or any of its employees, researchers and/or students.

14.2 The Parties shall not be liable against one another for any damages or loss of profit in connection with this Agreement unless this is caused by gross negligence or malicious intent of a Party, its licensees or any of its directors, employees, researchers or students.

14.3 Notwithstanding any other provisions and/or terms and conditions referred to herein, the Disclosing Party does not warrant that the use of the Materials does not or will not infringe any patent nor is the Disclosing Party under any obligation to obtain or provide licenses that may be required for the use of the Materials by the Receiving Party. The Material is experimental in nature and is provided by the Disclosing Party with no warranties, express or implied, including any warranty of merchantability, title, or fitness for a particular use. The Receiving Party will indemnify the Disclosing Party and hold the Disclosing Party harmless from any claims or liabilities that might arise as a result of the Receiving Party’s use of the Material.

15 MISCELLANEOUS

15.1 Any notice required or permitted to be given to the parties hereto is properly given if delivered, in writing, in person to the addresses on the first page of the Agreement or to such other addresses as may be designated in writing by the parties from time to time during the term of this Agreement.

16 DISPUTES

16.1 The Parties shall use reasonable endeavours to solve any dispute that will arise in connection to this Agreement by mutual arrangement. Any disputes between the Parties arising under or relating to this Agreement shall be first presented to senior management representatives of the respective Parties for resolution, who will attempt to resolve the matter amicably and promptly. If the Parties do not come to any solution, the Party by whom any legal action is instituted, will be entitled to choose the jurisdiction of a competent court as dominis litis.

17 JURISDICTION

17.1 This Agreement shall be governed by South African law and the Parties hereby irrevocably agrees to the jurisdiction of the High Courts of South Africa in respect of any dispute flowing from this Agreement.