# Examples of Project Descriptions from UICC fellowship applications

## Project Description

**This is the most important component of your application. The description must include sufficient scientific, medical and/or technical detail to allow evaluation of the significance of the problem and the likelihood that the project will have a successful outcome.**

### Example 1 ICRETT Clinical Application

**Addressing PediatricCancer and Palliative Care in Africa: The Urgent Need for Psychosocial Support Services (Ndiaye, Sokhna, Senegal)**

*** Purpose (include specific objectives):**

*Maximum 1,500 characters (including spaces)*

Psychosocial care of families and children with cancer has a major impact on their adherence with treatment, survival and quality of life. My objective is to acquire new skills in pediatric psycho-oncology to adapt them to African culture where there is virtually no formal psychosocial support for children.

In Senegal, literacy rates are low and there is a common belief that cancer cannot be cured. This attitude leads to late arrival for treatment of cancer and inability to undertake curative treatment. This is true of adults and children.

The need is great to educate parents of children with cancer about the disease, about what we know. Doing focus groups with them and writing materials to overcome the stigma and fear would help. Late arrival for treatment and often stopping before curative treatment is given is a problem. We also need to train parents to teach others in their community and within families, especially grandparents.

Regarding counseling children themselves, I need to learn some of the new methods to reduce anxiety and pain by distraction, cognitive behavioral psychotherapy, meditation, and hypnosis so widely used in the US. These techniques are simple, cheap to use and may be very valuable in Africa.

I picked the MSK Pediatric Psychiatry group, the National Institutes of Health's Clinical Center Pediatric Unit and the Dana Farber Institute as training sites from which I can learn a great deal because they are well established.

*** Background (Summary of the current situation):**

*Maximum 2,500 characters (including spaces)*

Four years ago in Senegal, I designed the first pediatric psychosocial support program which remains the only one in Africa. I provide individual counseling sessions, therapeutic and support groups to children and their families. We also offer individual counseling, talk groups and training to the medical staff.

There are several social and attitudinal problems in Senegal which contribute to poor outcome: parents often begin treatment with the traditional healer, lose time in the peripheral health system and arrive at the pediatric oncology unit quite late. They are informed on the spot that their child will be hospitalized for a few months, generally several kilometers away from home, which disturbs the function of the whole family. In the meantime, one parent's income is lost because there needs to be an accompanying parent; siblings are sometimes unable to attend school; expenses increase dramatically and the couple's relationship becomes strained. Parents are isolated in their distress, since they cannot tell others because they are ashamed of the stigma of cancer (a curse or karma). Working conditions in medical units are emotionally burdening for the insufficient human resources, which often brings doctors and nurses close to burnout and emotional fatigue. They become less efficient and develop defenses to distance them emotionally from the children and

their parents. Children feel anxious, guilty and frightened around worried adults who do not know how to talk to them.

Senegal and Tanzania stand out in supporting the cost of cancer care in children. On our unit, 2/3 of chemotherapy medication is offered freely to our patients thanks to our membership in the French-African Pediatric Oncology Group (GFAOP). Also, since 2014 we are collaborating with the Anne Marie Dione Foundation that covers all expenses for surgery of children with Wilm's tumor. Reducing the cost and stigma is a crucial part, but also supporting pediatric palliative care is equally important.

Cancer is killing more people in the developing world than HIV/AIDS, tuberculosis, and malaria combined. In Senegal, the WHO predicts between 600 and 800 new cases of pediatric cancer each year. Our psychosocial pediatric oncology program is at an early stage. This justifies my selection of the MSK Pediatric Psychiatry group, the National Institutes of Health's Clinical Center Pediatric Unit and the Dana Farber Institute as training sites.

*** Detailed work plan (please provide details of how the specific objectives will be achieved):**

*Maximum 5,000 characters (including spaces)*

The plan is that I begin in July at the host institute where I will work with the Pediatric Psychiatry group, 2 psychiatrists, and a psychologist. They cover pediatric consultation 24/7 with special attention to the problems of the very sick hospitalized children who often develop delirium and pain. Support for them and their parents is critical. They also have conferences in which the range of psychotherapies is discussed, as well as palliative care. Treatment of pain, anxiety and depression will be included, and an exposure to the survivorship clinic and problems of long term survivors. At the end of the month, I will accompany the team to the World Congress of Psycho-Oncology where I will present two posters. Following the meeting, I will spend the remainder of my time at the Pediatric Unit where the psychosocial care is fully integrated into routine care with a senior pediatric psychologist who has developed a remarkable tool for adolescents and young adults to help staff talk with the young people about their wishes about death. It is a powerful tool for me to learn to use. I will have a range of experiences there where hands-on excellent psychosocial care is given. The other venue planned is at the Cancer Center. It is noted for its child psychosocial care, and is led by an outstanding and highly respected psychologist, I will be able to see their multipronged approach, delivered through a division that combines psychosocial and palliative care. The several psychotherapies which are helpful for children are available at all three places and I will have a chance to observe and practice them with staff. I will go home with a host of ideas about organization, infrastructure, therapeutic approaches and new colleagues with whom to communicate in the future.

During this UICC fellowship, I am interested in observing the development of research protocols, observing how clinical studies are developed and conducted and exploring how these methods could be taken up in Africa. Education about providing emotional support for medical staff who are stressed to the limit is another skill that I hope to gain from seeing how staff support is provided in US centers and taking from that the parts that may work in Senegal. I will identify seminars and publications to discuss with American colleagues. Additionally, I hope to participate in Grand Rounds discussion of cases, workshops on key topics like anxiety, depression and pain control in children.

Finally, I believe that this fellowship will be an opportunity to establish a network of colleagues from US Institutes and cancer centers. Continued communication about clinical and research issues will be possible through the newly formed Psychosocial Oncology Society of Africa. I am confident I will be trained and ready to train others in Senegal and I will create the Senegalese Psychosocial Oncology Society. I will use

my experience in Dakar and what I learn to train others in Africa which I will do beginning by participating in the AORTIC/IPOS Academy in November 2015 in Marrakesh where the emphasis will be on support of children with cancer. From there, I expect to develop a network of psychologists, though small at the beginning, to support one another across the countries where pediatric units should develop to provide psychosocial care.

*** Expected transferable skills (Please provide details of the specific technologies, skills or new knowledge that will be gained during your visit):**

*Maximum 2,000 characters (including spaces)*

I need to be able to utilize the commonly used approaches to pain management in children, both psychological and pharmacological, which are used in the US. This will allow closer collaboration and education of oncologists delivering pain management in Senegal. During my time in the US, I hope to learn the new psychotherapy modes that have been tested and I can test in Africa for value, such as family therapy, couples, existential end of life therapies, and grief therapy. All are available for study at the host institution, and through the book by Kissane and Watson, Handbook of Psychotherapies in Cancer Care, Wiley, 2013. Also, I plan to explore the communication skills methods used at the host institution in which oncologists and nurses are taught through observer experience with an actor/patient, how to give bad news to parents and how to talk to children about their situation. Supporting staff in stressful care is important and I will learn more about how to encourage medical staff to address their personal health.

***Sustainability (Fellowships are intended to develop into a sustainable programme of research. Please provide details of the prospects for future sustainability. For example, how will you continue the work; apply and disseminate newly acquired skills; opportunities for funding; how the project meets strategic research goals of your institution):**

*Maximum 2,000 characters (including spaces)*

The newly acquired clinical and program planning skills will be used to re-assess our program in Senegal and will be integrated into our patient care. I expect to extend educational activities of my present group through training psychologists who will come to our Unit because of its high quality care. I expect to influence administration as to the importance of these psychosocial services. I will engage parents whose children are cured and who will advocate for the services being sustained and expanded. Similar to support for chemotherapy and radiation, psychosocial services should be an accepted and critical part of routine care.
We will be sharing these skills and materials with our colleagues in Senegal so that our program can inspire psychological support programs on other oncology units (not only pediatric oncology) in the country. I will utilize the Senegalese Psycho-Oncology Society members which I propose to organize.

*** Facilities available to continue the work, apply and disseminate newly acquired skills:**

- Pediatric oncology unit, University Hospital Aristide LeDantec
- Adult oncology unit – Juliot Curie Center in University Hospital Aristide leDantec
- The Mamelles Clinic: private clinic specialized in cancer care
- SOSECAN (Senegalese Cancer Society)

*Maximum 2,000 characters (including spaces)*

*** Relevance in your country (please provide information on why this project is relevant to the situation in your home country):**

*Maximum 1,500 characters (including spaces)*

There are virtually no psychosocial services for children with cancer in our country of 13 million. This adds to the ignorance, stigma and abandonment of children's cancer treatment. The impact on families, as they struggle with the financial, social and psychological burdens is enormous. Only education and support can change this situation – psychologists are desperately needed in this role. The situation is worse in other African countries. The need for attention to emotional support of patients and children is enormous.

This UICC fellowship will offer me a new opportunity to have guidance from those with experience to advise about new activities for our pediatric psychosocial program. On this basis, I plan to initiate innovated treatment for patients, families and staff such as counseling, relaxation and distraction for pain.

I plan to share my experience and newly acquired skills with my psychosocial colleagues in the field. Our pioneering pediatric psycho-oncology unit has the potential to be an "island of excellence" in Africa and to become a beacon for training.

*** Reason(s) for choice of host institute:**

*Maximum 1,500 characters (including spaces)*

My host supervisor has arranged observerships at two other institutions during this fellowship. These established centers intertwine day-to-day clinical care and research and offer much in advising our young program.

*** List up to 5 of your publications which are most relevant to this application:**

*Maximum 2,000 characters (including spaces)*

Holland, J, Breitbart, B, Loscalzo, M, Butow, P, Jacobsen, P, 3rd Edition, Textbook of Psycho-Oncology, Oxford Univ Press, 2015

Holland J, Weiss T. The new standard of quality cancer care: integrating the psychosocial aspects in routine cancer from diagnosis through survivorship. Cancer J. 2008 Nov-Dec;14(6):425-8. doi: 10.1097/PPO.0b013e31818d8934.

Holland JC. Distress screening and the integration of psychosocial care into routine oncologic care.J Natl Compr Canc Netw. 2013 May;11(5 Suppl):687-9. Review.

Holland JC. Progress and challenges in psychosocial and behavioral research in cancer in the twentieth century. Cancer. 1991 Feb 1;67(3 Suppl):767-73. Review.

Wiener, L, Pao, M, Kazak, A, Kupst, M, Patenaude, A, Arceci, R. 2nd Edition, Pediatric Psycho-Oncology: A Quick Reference on the Psychosocial Dimensions of Cancer Symptom Management, Oxford Univ Press, 2015 Acknowledgement to Holland,J for support for the 1st and 2nd editions.

*** Justification of project duration:**

*Maximum 1,500 characters (including spaces)*

My host supervisor and the two co-hosts believe that I need sufficient time at each place to observe key activities. The time span also includes a week at the Psycho-Oncology World Congress in Washington, DC. Our detailed work plan emphasizes the range of psychosocial activities, trainings and seminars I will be attending with renowned experts in pediatric psycho-oncology.

**Example 2: ICRETT Clinical Observership**

**Comparing Different Types of Surgery to Treat Patients with Stage IA Non-Small Cell Lung Cancer (Chen, Kezhong, China)**

*** Purpose (include specific objectives):**

*Maximum 1,500 characters (including spaces)*

There are different types of surgery used to treat early-stage lung cancer (NSCLC). Wedge resection or segmentectomy ("sublobar resection") may be less invasive than lobectomy, and may have fewer side effects and improve recovery. Currently there are two randomized controlled trials on going comparing the effectiveness of sublobar resection versus lobectomy in patients with stage IA NSCLC.
As one of the largest lung cancer centers in China, we have completed a clinical multicenter comparative study which compared therapeutic effect between video-assisted thoracoscopic lobectomy with thoracotomy. Our next plan is to perform a prospective multicenter randomized trial to compare lobectomy and sublobar resection in stage IA NSCLC in China. We have done some preparatory work. However, since this study will be a phase III clinical trial and more complex than the former, we hope to communicate with experienced experts to get over some difficulties in surgical technique and study design.
Therefore, the main objectives of this study are:
(1) To discuss the details in surgery, especially VATS segmentectomy and lobectomy and optimize our technique.
(2) To compare the safety, perioperative outcomes, costs and oncologic outcomes of sublobar resection and lobectomy with stage IA NSCLC at a high level comprehensive cancer center.
(3) To be clear of some key issues in this trial design, including: Sample size, Surgical margins, Primary endpoint, Period of follow up, etc.

*** Background (Summary of the current situation):**

*Maximum 2,500 characters (including spaces)*

Since the report of the Lung Cancer Study Group (LCSG) in 1995, lobectomy has been regarded by most thoracic surgeons as the gold standard for resection of early stage NSCLC. However, recent evidence derived mostly from retrospective case series supports the use of intentional limited resection for early stage NSCLC. Sublobar resection may be less invasive, may have fewer side effects and improve recovery, and possibly associated with 5-year survival comparable to that attained by lobectomy.
To investigate sublobar resection for early lung cancer, two randomized clinical trials with peripheral lung cancers no more than 2cm in diameter as the target lesions are being conducted in the United States by Cancer and Leukemia Group B (CALGB 140503) and in Japan by the Japan Clinical Oncology Group (JCOG0802). Patients are randomly assigned to have either a sublobar resection or lobectomy. However, there are some differences in the study design between the two trials. For the CALGB trial, the primary endpoint is disease-free survival and the secondary endpoints are overall survival, rate of local and systemic recurrence, and pulmonary function. The estimated enrolment is 1258. For the Japanese trial, the primary endpoint is overall survival and the secondary endpoint is postoperative pulmonary function, the targeted accrual is 1100 patients. The surgical margin is = tumor size and = 2cm in the two trials, respectively.
Due to its great scientific value, we plan to perform the only prospective multicenter randomized clinical trial comparing lobectomy and sublobar resection in stage IA NSCLC in China. After comparing the differences study design between the two trials above and evidence-based literature research, we completed our preliminary study design. But we need to discuss our idea with the experienced clinical trial investigators in order to make sure our plan is correct.
If the prognosis for patients who have segmentectomy is not significantly inferior to that for patients who have lobectomy and if the postoperative pulmonary function is significantly better for patients who have segmentectomy, we can definitively

conclude that the standard surgical modality for these early tumors should be segmentectomy. Future results from the randomized phase III limited resection trials CALGB140503 and JCOG 0802, and from our trial ,if possible, will hopefully elucidate the role of sublobar resection as a viable alternative to lobectomy for peripheral =2cm NSCLC.

*** Detailed work plan (please provide details of how the specific objectives will be achieved):**

*Maximum 5,000 characters (including spaces)*

As the project is to compare different types of surgery to treat patients with stage IA NSCLC, my work plan will include the following two aspects.

1. Observing operations and operations videos, to exchange skills and find a solution on technical difficulties in lobectomy and sublobar resection, especially thoracoscopic approach.

Technical challenges: Segmentectomy is considered a challenging procedure if done by thoracotomy and even more so if it is performed thoracoscopically. Not only the anatomical relationships are difficult to grasp, but the identification and division of the intersegmental plane is a concern. Some authors have suggested acting reverse, i.e., reventilating the whole lung once the segmental bronchus has been divided and then collapsing it, so that only the diseased segments remain inflated. Which method is better or is there any other technique for identification the intersegmental plane? I will discuss these technical questions with experienced surgeons.

(2) Oncologic considerations:

a. Intraoperative N0 status confirmed by frozen exam within a limited resection. It is imperative that a thorough intraoperative examination (pathological frozen section) of hilar and mediastinal lymph nodes be performed to exclude occult lymph node metastases before sublobar resection. If nodal metastases are found, a lobectomy should be performed. But how many stations of lymph node and number of lymph nodes should be performed? I will make certain with the experts.

b. Surgical margins:The greatest concern after limited resection is a possible increase in the rate of local recurrence. Studies examining the minimal margin necessary in limited resection are sparse. Generally, there are three different opinions about the minimal margins: >1cm, >2cm, equal to or greater than the maximal tumor diameter. Which is more preferable for sublobar resection is of my wish to learn about.

(3) Instruments: First of all, due to the difficulties of anatomical landmark in thoracoscopic segmentectomy, excellent exposure that allowing viewing from various different angles is necessary. Will it be enabled by second generation high-definition camera systems (1080P) or 3D thoracoscopy? Second, the new generation endoscopic staplers, like Endo-GIA tri-staple which can revolve in the head, have been used recently. I will pay my attention on whether this modified staple is helpful to negotiate delicate pulmonary vessels. Third, some special retraction instruments may be used for these surgeries in order to obtain better exposure. I plan to see these modified instruments like elongated oval forceps and learn the details of technique.

2. Observing clinical activities and participating in clinical conferences

(1) Clinical management: I will learn advanced treatment principle in order to change our outdated clinical conception. For example, we move the chest tube if the

drainage is less than 200ml on two consecutive days, which is also the way in most Chinese hospitals. But I hear that in many American hospitals, they move the tube even if the drainage is less than 500ml within 24 hours. Is it safe, or may cause more patients who have to undergo thoracic puncture because of excess pleural effusion? If this way were not to bring extra clinical risk, we would follow it in our hospital, which will certainly shorten the hospital length of stay. I am also concerned about other postoperative management, such as how to release postoperative pain, how to deal with postoperative morbidities, follow up criterion, and to compare the perioperative and oncologic outcomes between sublobar resection and lobectomy.

(2) Solve key issues in study design: I will participate in discussion forum of clinical trials in order to learn how to design and develop an excellent clinical trial. What's more, to be clear of some key issues in this study design. For example, the primary endpoint is disease-free survival and the secondary endpoints are overall survival and the estimated enrolment is 1258; while in the JCOG trial, the primary endpoints is overall survival and secondary endpoints is disease-free survival and the targeted accrual is 1100 patients. According to rapid development of targeted individual therapy, we prefer disease-free survival for primary endpoint, and our assumed sample size is 900 when we deem sublobar resection as non-inferior to lobectomy if the 3-year disease-free survival is no more than 0.10 less than that for sublobar resection. In consideration of the difference, I need to communicate with the experts to definite whether my design is correct or should be revised.

To complete this work, in my planned schedule, I hope to observe about 5 sublobar operations and 3 lobectomies per week, attend clinical activities every day and participate in clinical conferences every week. I will also bring along my operation videos, to discuss the advantages and disadvantages of our technique with experts.

*** Expected transferable skills (Please provide details of the specific technologies, skills or new knowledge that will be gained during your visit):**

*Maximum 2,000 characters (including spaces)*

1. Optimize our technique of lobectomy and sublobar resection
Segmentectomy is more complicated if it is performed thoracoscopically, as we plan to compare different types of surgery, our technique should be optimized further. For example: How to expose better viewing if the tumor is oversized? Whether lymph node dissection should be performed prior to or following lobectomy? How to deal with calcified lymph node adhere to artery? How to reduce convention rate and ensure the safety of operation concurrently? These skills will be gained during my visit..
2. Modify our clinical principle both in perioperative period and in follow up period.
I will compare the perioperative and postoperative clinical outcomes of sublobar resection and lobectomy. Including: blood loss, surgery time, chest tube duration, length of stay in hospital, conversion rate, costs, quality of life after surgery, number of resected lymph nodes, how to release postoperative pain and how to deal with postoperative morbidities. I will review the follow up statistic data in the host institute, to see the 5-year recurrence rate and survival rate after sublobar resection and lobectomy. All of above are to improve our used clinical treatment. The hypothesis is that sublobar resection could achieve similar disease free survival and 5-year overall survival, less hospitalization, intubation time, perioperative complication, and better postoperative pulmonary function.
3. The requirement of designing and developing an excellent clinical trial.
Details of how to design and develop an excellent clinical trial is of my concern. I will ask the statistician at the host institute how to estimate sample size, and discuss with the experts to make certain the inclusion and exclusion criteria, post-operative follow-up criterion, recruitment and timeline, etc. I will also get the answer of whether disease free survival or overall survival should be the primary endpoint.

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| ***Sustainability (Fellowships are intended to develop into a sustainable programme of research. Please provide details of the prospects for future sustainability. For example, how will you continue the work; apply and disseminate newly acquired skills; opportunities for funding; how the project meets strategic research goals of your institution):**<br>*Maximum 2,000 characters (including spaces)* | Professor Jun Wang, who was awarded ICRETT fellowship in 1995, is my home supervisor. He told me that he benefited a lot from this opportunity. After the fellowship, he introduced thoracic surgery to China and popularized this approach throughout China. Now he has been a great famous thoracic surgeon in China. His personal experience inspires me to follow his steps.<br>The project meets the strategic of our department. We plan to perform a prospective multicenter randomized trial to compare lobectomy and sublobar resection in stage IA NSCLC in China. We have completed preliminary protocol of our clinical trial and reached an agreement cooperating in this trial with more than 20 hospitals in China. Our multi-center databases have been used. I am one of the main investigators of this trial. When I come back to my department after the fellowship, I will optimize our technique of thoracoscopic lobectomy and limited resection by transferable skills during my visit, and make certain some key questions of this trial. Then we will finally complete our protocol, register in clinicaltrials.gov and start this prospective study. We will also publish high quality papers, apply Chinese National Natural Science Fund and the Capital Health Research Funding for further study. We will share our experience in next national annual mini invasive surgery training courses by operation videos and lectures. What's more, in our next academic book which will be published in the next year, we will share our technical improvement in detail. Besides, we have kept more than 2500 paired frozen specimen and blood samples of our NSCLC patients. With more advanced surgical technique and more samples, we also plan to do some molecular analysis based on the second generation sequencing to select the predictive and prognostic markers in the future. |
| ***Facilities available to continue the work, apply and disseminate newly acquired skills:**<br>*Maximum 2,000 characters (including spaces)* | Our department began thoracoscopic surgeries earliest in China. Now we perform more than 800 lung cancer surgeries each year. We have held national annual mini invasive surgery training courses for 19 years and trained more than 2500 thoracic mini invasive surgical surgeons. In every two months, we also hold senior VATS lobectomy learning symposium, in which 8 experts from other large hospitals come to our department visiting the operations and exchanging the skills. We won the National Prize for Progress in Science and Technology in the space of lung cancer minimally invasive treatment in 2012, which was the first national prize in history in China. Our department has published 10 academic books about minimally invasive surgery in Chinese since 1994, including surgery of mediastinoscopy, rigid bronchoscopy, video-assisted thoracoscopic surgery, etc. All of above proved that we keep on disseminating our surgical approach every year.<br>In detail, I will do my best serving my patients with all I have learned, and I have many chances to disseminate newly acquired skills in China. First, I will share the excellent experience in the web of our department (www.xiongwai.com). Second, although Facebook and Twitter is prohibited in China, we have Wei Xin and Wei Bo for real-time online communication, which is used by more than 5 hundred million people in China. I will share my gained knowledge with my patients and friends on them. Third, I would like to share the experience in my lectures for the residents and interns of our hospital. Besides, due to good cooperation with some hospitals before, we will carry out a multicenter clinical study. I will share the skills and experience gained from the fellowship in this clinical trial. Furthermore, we have a lobectomy database online in the web of our department, which has enrolled more than 3000 patients. I can supply these clinical data for collecting international cancer data and the world wide cancer control. |
| ***Relevance in your country (please provide information on why** | Latest statistics shows that there are more than six hundred thousand new cases of lung cancer and up to five hundred thousand cases dead of lung cancer each year. However, owing to the unbalanced development of regional economies in China, medical level is uneven in different areas. Many patients cannot receive standard |

**this project is relevant to the situation in your home country):**

*Maximum 1,500 characters (including spaces)*

treatment, which to some degree leading to a very low 5-year survival rate. Therefore, promoting lung cancer treatment is of great significance in China. As a thoracic surgeon, I dedicate to develop and spread advanced surgical approach. However, due to concerns regarding the completeness of oncologic resection and technical difficulties, video-assisted thoracic surgery has been relatively limited in many hospitals in China, let along the use of complicated thoracoscopic segmentectomy. On the other hand, since China's aging population intensified, limited resection may bring more benefit than lobectomy for these elderly patients. It is of great importance to compare the different types of surgery, to pinpoint better therapeutic protocols for the increasing number of lung cancer patients.
Besides, Chinese surgeons were not used to cooperate with each other. There were few phase III multicenter clinical trials in China. Now things changed, people are aware of the importance of collaborative research. I expect to learn advanced evidence through this fellowship, and to push the progress of cooperation and treatment for lung cancer in China.

*** Reason(s) for choice of host institute:**

*Maximum 1,500 characters (including spaces)*

The host institute is among the most experienced centers in the United States in surgery for lung cancer, performing more than 1,200 operations for lung cancer each year, and among the lowest rates of complications following surgery in the country. Nearly 70 percent of patients at the host institute are able to have this minimally invasive approach.
In addition, the host institute is able to offer many clinical trials, covering a broad range of subjects. My host supervisors are investigator and co investigators of the above mentioned clinical trial--CALGB 140503, which have a great certain reference value for our future trial. The host institute is also home to one of the world's top cancer research programs. Their scientists and physicians work together to turn scientific discoveries into new and improved cancer treatments.
Besides, my host supervisor is one of the first thoracic surgeons in the United States to develop expertise in minimally invasive or VATS approaches. My host supervisor's thoracic surgery team is among the most experienced in the United States, and has expertise in both minimally invasive and traditional "open" surgical approaches, which meet the needs of my proposed study.

*** List up to 5 of your publications which are most relevant to this application:**

*Maximum 2,000 characters (including spaces)*

1. Fan Yang, Kezhong Chen, Jun Wang. Risk Factors of Recurrence for Resected T1aN0M0 Invasive Lung Adenocarcinoma: a Clinicopathologic Study of 177 Patients. World J Surg Oncol,2014;12:285.
2. Kezhong Chen, Yun Li, Jun Wang. VATS vs Open Lobectomy for stage I or II NSCLC. Difficult Decisions in Thoracic Surgery: An Evidence-Based Approach.3rd ed. 2014; Chapter 11:137-52.
3. Kezhong Chen, Fan Yang, Jun Wang, et al. Development and Validation of a Clinical Prediction Model for N2 Lymph Node Metastasis in Non-Small Cell Lung Cancer. Ann Thorac Surg, 2013;96:1761–8.
4. Yun Li, Kezhong Chen, Jun Wang. Development and Validation of a Clinical Prediction Model to Estimate the Probability of Malignancy in Solitary Pulmonary Nodules in Chinese People. Clin Lung Cancer, 2011;12(5):313-9.

*** Justification of project duration:**

*Maximum 1,500 characters (including spaces)*

Taking the lead in developing minimally invasive thoracic surgery in China, we began routine VATS lobectomy earliest in China. Our department has accumulated a certain experience of thoracoscopic surgery, and I am already familiar with VATS lobectomy. I believe that in one month I will be able to learn the key skills and optimized our technique of VATS lobectomy and sublobar resection. Besides, since I have participated in some clinical trials in China, I trust I will make certain the crucial problem and revise our study design successfully. As one of the main investigators of our planned multicenter clinical trial, I ensure the fellowship will develop into a sustainable program and the project will achieve its goal.

**Example 3: ICRETT Research Application**

**Molecular Subtyping of gastric cancer from Nigerian patients (Dr Henry Okuchukwu Ebili, Nigeria)**

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| * **Purpose (include specific objectives):** *Maximum 1,500 characters (including spaces)* | 1.To acquire transferrable skills in molecular methods, such as high throughput High Resolution Melt Analysis (HRM), methylation-specific HRM (MS-HRM), mutation-specific PCR (MS-PCR), the quick multiplex consensus PCR (QMC-PCR), pyrosequencing, and aspects of bioinformatics, such as Cluster Analysis.<br>2.To derive a molecular subtyping scheme for Nigerian gastric cancer cases from the genetic alterations such as tyrosine kinase receptors amplification, KRAS, BRAF, PIK3CA, TP53, PTEN mutations, etc., using the above techniques. |
| * **Background (Summary of the current situation):** *Maximum 2,500 characters (including spaces)* | Only a few studies have attempted to derive a molecular classification for gastric cancer. The importance of molecular classification of cancers cannot be overemphasized as classification schemes have proved to be veritable tools for proper prognostication of patients and prediction of response to targeted therapy, as has been recognized in breast and colorectal cancers. Gastric cancer has a dismal prognosis among Nigerians, and as such, subtyping this tumour will go a long way to assist in stratifying patients into prognostic and therapeutic groups.<br>At this point in time, formalin-fixed, paraffin-embedded (FFPE) DNA template is the most available and reliable samples for operations in Molecular Pathology in Nigeria because formalin-fixation-and-paraffin-embedding is the most practical, cost effective and convenient way of preserving DNA (and other biomolecules) in the Nigerian setting. Many of our samples in this project are over 20 years old. However, FFPE DNA are degenerate and difficult to amplify with PCR, and therefore, any technique which will aid the PCR amplification of this type of DNA in order to utilize them in downstream applications such as HRM, MS-PCR, etc., is a welcome relief. The QMC-PCR has been used successfully in downstream HRM Analysis by the host supervisor's research group. We will find out if this technique is suitable for our set of samples. |
| * **Detailed work plan (please provide details of how the specific objectives will be achieved):** *Maximum 5,000 characters (including spaces)* | About 200 gastric cancer samples resected between 2000 and 2009 in Nigerian Hospitals will be included in this study. All cases have a minimum of five years follow-up.<br><br>DNA extraction and quality control for PCR: DNA will be extracted from Formalin Fixed Paraffin Embedded (FFPE) tissue. Following pathology review, blocks will be selected which contain the highest proportion of tumour cells. Four 10 micron sections will be de-waxed in xylene and undergo standard proteinase K digestion before extraction through DNEasy columns (QIAGEN, Hilden, Germany). The suitability for PCR will be tested using a multiplexed PCR according to published methods.<br><br>Genotyping: The Host supervisor's lab has developed the QMC-PCR protocol for FFPE tissue which, together with High Resolution Melting (HRM) analysis, will be used to rapidly screen tumours for the following genotypic abnormalities. Gene amplification involving receptor kinase genes (eg, EGFR, FGFR, HER2, etc) will be tested for using comparative quantitative PCR. Tumours will also be tested for mutation in the hotspots of KRAS, BRAF, TP53, PIK3CA, and PTEN.<br><br>Statistical analyses: A model will be built to integrate both the pathological data and the molecular data. These will be categorical data (mostly dichotomous) and associations between each category will be tested using Fisher's exact test with multiple testing correction using the method of Benjamini and Hochberg. A |

dichotomous heat map with unsupervised hierarchical clustering will identify subsets. For each molecular subset survival analysis will be performed using Kaplan-Meier curves (right censored after five years) and the statistical significance of differences in disease-specific survival between groups will be estimated using the log-rank test. The Cox proportional-hazards model will be used for multivariate analysis in order to determine the relative risk and independent significance of each subset. In all cases p-values <0.05 is considered as statistically significant. Analyses will be performed on SPSS software.

Cluster Analysis: Web-based cluster analysis with devices such as that available at www.r-project.org will be utilized to perform both supervised and unsupervised clustering to determine if the genetic alterations form patterns of clusterings or subtypes in the tumour set.

*** Expected transferable skills (Please provide details of the specific technologies, skills or new knowledge that will be gained during your visit):**

*Maximum 2,000 characters (including spaces)*

HRM Analysis can be a high throughput method for genotyping, the knowledge of which is applicable to large population genetic screening, mutation screening and investigation of epigenetic mechanisms in Molecular Pathology. A modification of HRM is the methylation-specific HRM which is used to study epigenetic events such as occurs in cancers.
The MS-PCR and pyrosequencing are also other genotyping methods which are transferable and applicable to many research operations in Nigeria.
The bioinformatics skill of clustering analysis will be essential to defining molecular classes of tumour and defining biological pathways in tumourigenesis, for example. This is important in this era of attempting to define complex patterns of genetic alterations in tumours from different ethnic populations.
The QMC-PCR is another transferrable technique which will find useful application in the Nigerian setting

***Sustainability (Fellowships are intended to develop into a sustainable programme of research. Please provide details of the prospects for future sustainability. For example, how will you continue the work; apply and disseminate newly acquired skills; opportunities for funding; how the project meets strategic research goals of your institution):**

*Maximum 2,000 characters (including spaces)*

The Pathology Department of the Olabisi Onabanjo University is on the verge of setting up a molecular research laboratory to enable researches in Molecular Pathology, molecular genetics, microbial genetics, etc. the skills acquired from this fellowship will be put to good use when the laboratory becomes functional in a few months' time. Hence the need for this Technology Transfer fellowship.

*** Facilities available to**

Facilities for continuation of work and dissemination of skills will soon be available at

**continue the work, apply and disseminate newly acquired skills:**

*Maximum 2,000 characters (including spaces)*

the Olabisi Onabanjo University Pathology Department.
However, I am involved in a number of collaborative works at the University College Hospital (UCH), Ibadan, where I had my residency training. At present there is a molecular/genetics laboratory at the Institute of Advance Medical Research And Training, UCH, Ibadan which recently acquired a Real Time PCR machine with HRM capabilities. It is also able to carry out operations a real time PCR can do. My involvement in some these research works at UCH, Ibadan, will afford me the opportunity to immediately apply and disseminate the skill acquired during the fellowship.

*** Relevance in your country (please provide information on why this project is relevant to the situation in your home country):**

*Maximum 1,500 characters (including spaces)*

With the exception of breast cancer, little has been done to derive molecular classes or subtypes for cancers in Nigeria. Molecular classification of cancers has important therapeutic and prognostic use as has been found with breast and colorectal cancers. With the dismal prognosis of Nigerian gastric cancer, it becomes more important to derive a molecular classification for our patients.
The skills that will be derived or perfected in this fellowship are important to the manpower development efforts in Molecular Pathology which is currently going on in Nigeria.

*** Reason(s) for choice of host institute:**

*Maximum 1,500 characters (including spaces)*

The host institution has an excellent reputation for medical research, and provides conducive and convenient programmes to aid development of research.
The host supervisor is an experienced Molecular pathologist with expertise in many molecular/genetic methods/ techniques for research.
Facilities available at the host institution include Real time PCR facilities, pyrosequencing, the Lightscanner for high resolution melting, etc. But more importantly, there is a rich research culture which encourages mentoring, exchanges of ideas, skills, etc.

*** List up to 5 of your publications which are most relevant to this application:**

*Maximum 2,000 characters (including spaces)*

1. Ebili HO, Oluwasola AO, Olopade OI. Molecular subtypes and prognosis of breast cancer. In: PERSONALIZED MANAGEMENT OF BREAST CANCER. Jatoi I, Holloway TL (Eds). Future Medicine, London, UK. DOI:10.2217/EBO.13.374 (2014) In Press.

2. AO Oluwasola, JA Otegbayo, SO Ola, HO Ebili, AO Afolabi, GN Odaibo. Correlation of Serum Anti-Helicobacter pylori Immunoglobulin A (IGA) with Histological Parameters of Chronic Gastritis in Ibadan, Nigeria. Annals of Ibadan Postgraduate Medicine, 2012; Vol.10, No.1 18-24.

3. AO Oluwasola, JA Otegbayo, SO Ola, HO Ebili, AO Afolabi, GN Odaibo. Correlation of Cag-A serological status with Histological Parameters of Chronic Gastritis among dyspeptic patients in south western Nigeria. African Journal of Medical Sciences, 2012; Vol. 41: 289-295.

4. GO Ogun, HO Ebili, TR Kotila. The pattern and causes of mortality in sickle cell disease at the University College Hospital, Ibadan, Nigeria: an Autopsy Study. Histopathology, 2012; Volume 61, Issue Supplement s1: 1–244.

*** Justification of project duration:**

*Maximum 1,500 characters (including*

The most difficult part of the project is finding the best PCR parameters for your set of samples, and this usually takes about 2 weeks for difficult DNA templates like FFPE DNA. The proposed 4 weeks period for this present fellowship will be spent extracting DNA and actually running the experiments proper based on prepared protocols. And since we will be utilizing a high throughput method (LightScanner) for

*spaces)* the HRM, 4 weeks should be enough for the whole project.