

MUTHI Final Publishable Summary after period 3:

It is recognised that research must be a basis for better health throughout Africa (e.g. Global Ministerium Forum on Research for Health, Bamako 2008, Beijing declaration 2008). As a consequence it is a priority to build research capacities in the African continent that will set good standards for the development of improved health security and systems in the future. In several African countries western medicine is not widely available, and WHO has recognised the role of traditional medicine and its practitioners in primary health care. MUTHI is a Coordination and Support Action project under the EC's 7th Framework Programme (Health). The overall objective of the project is to create sustainable research capacity and research networks between the participants in Africa (Mali, South Africa and Uganda), collaborating neighbouring institutions, and the European project participants to obtain improved health in Africa. We have identified needs and started to develop and deliver research training programmes. The research institutions from Africa taking part in the project have started to implement research methodologies so that they are able to improve traditional medicines, identify bio-active compounds, and clinically evaluate and register medicinal products that are used for the treatment of illnesses that are frequent in African countries.

In most African countries the availability of so-called western medicine is scarce, but there is still a living tradition for the use of herbal remedies for treating the ailments the local population suffer from. Several of the remedies used have never undergone any quality control, neither on the chemical or biological side, nor on the possible toxicological problems some of these plant products may give rise to. There exist limited laboratory facilities, including personal skills, for analysing natural compounds, and clinical trials on herbal remedies are non-existent for most products. It is also important for the practitioners to improve their knowledge of intellectual property rights (IPR).

The overall objective of MUTHI is to create sustainable research capacity and research networks between the participants in Africa, collaborating neighbouring institutions, and the European project participants to obtain improved health in Africa. The primary object of research is traditional medicine and especially focuses on the products present in water extracts.

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The project's kick-off meeting was held in January 2011 in Cape Town. Further consortium meetings were held in Bamako, Nov. 2011, Kampala, Jan. 2013, in Oslo, Oct. 2013 and in CapeTown Sept 29th – 30th 2014 as the final meeting of the consortium. In Bamako and Oslo the whole advisory board was present, in Cape Town in 2014 only one of the members were present. It has been agreed that the project's most important tasks should be:

- Use already recorded knowledge on the use of medicinal plants against the focus ailments from the African countries for preparation of Improved Traditional Medicines (ITMs)
- Partner with African traditional health practitioners to share, integrate and evaluate new information using participatory medical anthropological and ethnopharmacological methods
- Train all African participants in medical anthropology, local knowledge systems and local perceptions of the healers and the local population
- Develop a systematic methodology for the screening and testing of plants that can be candidates for ITMs both chemically and biologically.
- Develop a methodology for the quality assurance (chemical) of the products from the identification of the plant material used all the way through to the final products with batch to batch standardization including bioassays for securing the desired bioactivity
- Develop methodologies and protocols for observational and clinical trials and develop e-learning courses
- Integrate all of these steps in training programs that are capable of being continued after the Co-ordination Action has ended in such a way as to ensure that the Action will result in the sustainable development of capacity for health research in three different African states from the

North West, North East and South of Africa

- Make the training courses more widely available to other African institutions who are not partners in this project, but who have similar training needs

The five WPs have been dealing with all aspects mentioned above. Workshops for training participants from all four African partners within all areas have taken place. Workshops within ethnopharmacology and ethnobotany were held in Uganda in 2013. This was mainly lectures, but also presentations given by the trainees on the results of their fieldwork that followed the training given in the first reporting period, relating to the main illnesses in the different areas. Training on how to write a clinical trial protocol was the object for a workshop held in Cape Town as a continuation of the training from the first period. An e-learning training package was developed and this has been followed by more than 400 persons up to December 2014. The participants were not only from MUTHI, but also from other institutions in the neighboring countries. Workshops both within chemical methods and bioassays were held in Uganda in Jan/Feb 2013. SOPs for the bioassays were developed in all partner laboratories, and Monographs for 12 plants were written as a result of the training both in WP2 and 3. Training related to IPR was also continued, and the participants have prepared model MoU's to be used as contracts when interviewing healers. Further training in IPR was an important part of the workshop held in Kampala in Feb 2013.

The training of scientists in other laboratories was mainly done in the European laboratories, but also in other African partner laboratories if relevant. Makerere has had scientists trained both at Bloemfontein, in Bergen and in Oslo. Bamako has had people visiting Bloemfontein, Bergen and Oslo for further training. In Bergen both scientific and technical staff members from Uganda were trained. As one of the partners, Bamako, has French as the main language, the partner from Oxford held during the spring 2014 a course covering ethnopharmacology, IPR and clinical trials for the Malian partners to make sure that they also are on the same level as the other partners in MUTHI.

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At the end of the project period it has been established improved research facilities and qualifications in the African laboratories, as well as personal qualifications in all areas related to MUTHI. MUTHI African participants have been trained so that the remedies used based on traditional knowledge can be quality controlled both chemically and biologically. Compounds from selected plants have been isolated, elucidated and published. Training aspects in workshops have given knowledge on how to perform clinical trials, especially RTOs (Retrospective Treatment Outcome studies) in the future, as well as been given knowledge on IPR applied on selected areas of the project.

The total knowledge obtained through MUTHI have made the involved African laboratories, either alone or in collaborations with others capable of producing traditionally based remedies in controlled laboratory conditions. They know that they always start on an ethnopharmacological survey being necessary as the background for choosing a particular plant; they know how to identify both chemically and biologically the important bioactive parts of the plant. They have also been trained in methods necessary for making fingerprints of the products present in the plants by different chromatographic methods. This can then be used for batch to batch control of the chemical contents of the product as well as being used as methods for the relevant bioassay testing. Toxicological as well as clinical studies can be performed and they have all been trained in the regulations related to the intellectual property rights so that those issues are handled according to the international and national rules of this area. The participating African MUTHI partners have also included neighboring countries as well as local governments on the health side when this was relevant. With better controlled products this will after this training give a health benefit for the whole African population, at a low cost.