



Name: Charles Masembe (BVM, MSc., PhD)

Associate Professor,
Wellcome Trust Fellow,
Makerere University,
P.O. Box 7062, Kampala, Uganda
Email: cmasembe@cns.mak.ac.ug
Tel.: +256 712 455 987
Website: <http://asf.mak.ac.ug>

Charles Masembe is a veterinarian, molecular geneticist and Associate Professor, with teaching and research experience in molecular genetics, diagnostics, evolution and epidemiology of important diseases of domestic animals, mainly Foot-and-Mouth Disease, African swine fever, and pathogen discovery. He has an MSc in Environment and Natural Resources Management (Makerere University), a PhD in Molecular Population Genetics (Makerere and Copenhagen University), and Post-Doctoral training (Makerere, Copenhagen University, and the Technical University of Denmark). I have been a visiting scientist under the Africa Biosciences Challenge Fund at the Biosciences eastern and central Africa (BecA-ILRI) with a main emphasis on Metagenomics, and a Visiting Research Scientist at Yale School of Public Health and the Swedish University of Agricultural Sciences.

Through the opportunities and platform provided by RUFORUM and other collaboration partners he has excelled in capacity and research-network building. Charles is now a Wellcome Trust fellow under the Intermediate Fellowship in Public Health and Tropical Medicine program; with a major focus on "Transmission dynamics of African swine fever in an endemic setting at the livestock-wildlife interface" (<http://asf.mak.ac.ug>).

Charles is experienced in the molecular biology and serological techniques needed for sampling and genetics/disease investigations in a variety of species. Research in his team has generated and published scientific information for conservation of Africa's wildlife resources and patterns of disease transmission at the wildlife-domestic interface. This expertise has grown to a level that has genetically characterised animal epidemics with particular emphasis on foot-and-mouth disease in the African Great Lakes region, and is aimed at unraveling livestock-wildlife disease interactions to design efficient disease control strategies for FMD. Charles' team has a vibrant research facility, which has in the recent past had active research on a diversity of projects (e.g. EU-FP7-NEXTGEN; Livestock-Wildlife Diseases in East Africa-DANIDA; Molecular tools for schistosome biology EU-CONTRAST; Conserving biodiversity in Uganda DARWIN INITIATIVE; Smallholder pig value chain development in Uganda; ASF in Uganda-FORMAS).

Some peer reviewed publications

Ståhl, K., Ogweng, P., Okoth, E., Aliro, D., Muhangi, LeBlanc, N., Atimnedi, P., Berg, M., Bishop, R.P., Rasmussen, H.B. and **Masembe, C.** (2014). Understanding the dynamics and spread of African swine fever virus at the wildlife-livestock interface: insights into the potential role of the bushpig, *Potamochoerus larvatus*. *Suiform Soundings* 13 (1), 24-28.

Chenais E, Boqvist S, Sternberg-Lewerin S, Emanuelson U, Ouma E, Dione M, Aliro T, Crafoord F, **Masembe C**, Ståhl K. (2015). Knowledge, Attitudes and Practices Related to African Swine Fever Within Smallholder Pig Production in Northern Uganda.

Muhangi, D, **Masembe, C**, Berg, M, Ståhl, K, Ocaido, M (2014) Practices in the pig value chain in Uganda; implications to African swine fever transmission - *Livestock Research for Rural Development* 26 (5) 2014

Kerfua, D.S., Isubikalu, P., Ademun, R.O., Muwanika, V.B., and **Masembe, C.** (2013). Molecular characterisation of serotype O foot-and-mouth disease virus from pigs: Implications for multi-species approach to disease control in Uganda. *African Journal of Biotechnology* Vol. 12(19), pp. 2547-2552.

Blomstrom, A.L., Stahl, K., Okurut, A.R., Masembe, C., Berg, M., 2013, Genetic characterisation of a porcine bocavirus

- detected in domestic pigs in Uganda. *Virus Genes* 47, 370-373.
- LeBlanc, N., Cortey, M., Pinero, J.F., Gallardo, C., **Masembe, C.**, Okurut, A.R., Heath, L., van Heerden, J., Sanchez-Vizcaino, J.M., Stahl, K., Belak, S., 2013, Development of a Suspension Microarray for the Genotyping of African Swine Fever Virus Targeting the SNPs in the C-Terminal End of the p72 Gene Region of the Genome. *Transbound Emerg Dis* 60, 378-383.
- Mwanja, M.T., Muwanika, V., Masembe, C., Nyakaana, S., Mwanja, W.W., 2013, Evolutionary history of Nile perch *Lates* sp inferred from mitochondrial DNA variation analyses. *Zool Stud* 52.
- Muwanika, V.B., Nakamya, M.F., Rutaisire, J., Sivan, B., and **Masembe, C.**, 2012, Low genetic differentiation among morphologically distinct *Labeobarbus* species (Cyprinidae) in the Lake Victoria and Albertine Basins, Uganda: insights from mitochondrial DNA. *African Journal of Aquatic Science*, 37(2), //dx.doi.org/10.2989/16085914.2012.668850.
- Masembe, C.**, Michuki, G., Onyango, M., Rumberia, C., Bishop, R.P., Appolinaire Djikeng, A., Stephen J. Kemp, S.J., Orth, A., Skilton, R., Stahl, K., and Fischer, A., 2012, Viral metagenomics demonstrates that domestic pigs are a potential reservoir for Ndumu virus. *Virology Journal* 9:218: doi:10.1186/1743-422X-9-218.
- Brink, M., Ståhl, K., **Masembe, C.**, Okurut, A.R., Berg, M., Blomström, A.L., 2012, First time molecular detection and phylogenetic relationships of Torque teno sus virus 1 and 2 in domestic pigs in Uganda: further evidence for a global distribution. *Virology Journal* 9: 39, doi: 10.1186/1743-422X-9-39.
- Neil LeBlanc, Martí Cortey, Jovita Fernandez Pinero, Carmina Gallardo, **Charles Masembe**, Ademun Rose Okurut, Livio Heath, Juanita van Heerden, José Manuel Sánchez-Vizcaino, Karl Ståhl and Sándor Belák, 2012. Development of a Suspension Microarray for the Genotyping of African Swine Fever Virus targeting the SNPs in the C-Terminal End of the p72 Gene Region of the Genome. *Transboundary and Emerging Diseases*. DOI: 10.1111/j.1865-1682.2012.01359.x
- Blomström AL, Ståhl K, Okurut AR, **Masembe C**, Berg M. (2012). Genetic characterisation of a porcine bocavirus detected in domestic pigs in Uganda. *Virus Genes*. 2012 Dec 9. [Epub ahead of print] *Virus Genes*; DOI 10.1007/s11262-012-0855-1.
- Chaz Hyseni, Agapitus B Kato, Loyce M Okedi, Charles Masembe, Johnson O Ouma, Serap Aksoy and Adalgisa Caccone (2012), The population structure of *Glossina fuscipes fuscipes* in the Lake Victoria basin in Uganda: implications for vector control. *Parasites & Vectors*, 5:222. doi:10.1186/1756-3305-5-222.
- Mwanja T. Matthew, Vincent B. Muwanika, Sylvester Nyakaana, **Charles Masembe**, Dismas Mbabazi, Justus Rutaisire and Wilson. W. Mwanja (2012), Population morphological variation of the Nile perch (*Lates niloticus*, L. 1758), of East African Lakes and their associated waters. *African Journal of Environmental Science and Technology* Vol. 5(11), pp. 941-949.
- Mwanja T. Matthew, Wilson Waiswa Mwanja, Vincent B. Muwanika, **Charles Masembe** and Sylvester Nyakaana, 2012. Genetic evidence of successful establishment of the Nile perch (*Lates spp. L.*) in East African lakes and implications for management. *Management of Biological Invasions*, 3 (2):77-88.
- Vincent B. Muwanika, Richard Kock, **Charles Masembe** and Hans R. Siegismund 2012. Genetic diversity in the desert warthog (*Phacochoerus aethiopicus delameri*) population of eastern Africa. *South African Journal of Wildlife Research* 42(1): 54-59.
- Mwanja T. Matthew, Wilson Waiswa Mwanja, Vincent B. Muwanika, **Charles Masembe** and Sylvester Nyakaana, 2012. Genetic evidence of successful establishment of the Nile perch (*Lates spp. L.*) in East African lakes and implications for management. *Management of Biological Invasions*, 3 (2):77-88.
- Vincent B. Muwanika, Richard Kock, **Charles Masembe** and Hans R. Siegismund 2012. Genetic diversity in the desert warthog (*Phacochoerus aethiopicus delameri*) population of eastern Africa. *South African Journal of Wildlife Research* 42(1): 54-59.
- Kasambula, L., Belsham, G.J., Siegismund, H.R., Muwanika, V.B., Ademun-Okurut, A.R., **Masembe, C.**, 2011, Serotype Identification and VP1 Coding Sequence Analysis of Foot-and-Mouth Disease Viruses from Outbreaks in Eastern and Northern Uganda in 2008/9. *Transboundary and Emerging Diseases*. doi: 10.1111/j.1865-1682.2011.01276.x.
- Sangula, A.K., Siegismund, H.R., Belsham, G.J., Balinda, S.N., **Masembe, C.**, Muwanika, V.B., 2011b, Low diversity of foot-and-mouth disease serotype C virus in Kenya: evidence for probable vaccine strain re-introductions in the field. *Epidemiology and Infection*, 139, 189-196.
- Ayebazibwe, C., Mwiine, F.N., Balinda, S.N., Tjornehoj, K., **Masembe, C.**, Muwanika, V.B., Okurut, A.R.A., Siegismund, H.R., Alexandersen, S., 2010b, Antibodies Against Foot-and-mouth Disease (FMD) Virus in African Buffalos (*Syncerus caffer*) in Selected National Parks in Uganda (2001-2003). *Transboundary and Emerging Diseases*, 57, 286-292.
- Balinda, S.N., Belsham, G.J., **Masembe, C.**, Sangula, A.K., Siegismund, H.R., Muwanika, V.B., 2010a, Molecular

- characterization of SAT 2 foot-and-mouth disease virus from post-outbreak slaughtered animals: implications for disease control in Uganda. *Epidemiology and Infection*, 138, 1204-1210.
- Balinda, S.N., Sangula, A.K., Heller, R., Muwanika, V.B., Belsham, G.J., **Masembe, C.**, Siegismund, H.R., 2010c, Diversity and transboundary mobility of serotype O foot-and-mouth disease virus in East Africa: Implications for vaccination policies. *Infection Genetics and Evolution*, 10, 1058-1065.
- Balinda, S.N., Siegismund, H.R., Muwanika, V.B., Sangula, A.K., **Masembe, C.**, Ayebazibwe, C., Normann, P., Belsham, G.J., 2010e, Phylogenetic analyses of the polyprotein coding sequences of serotype O foot-and-mouth disease viruses in East Africa: evidence for interserotypic recombination. *Virology Journal* 7, 199. **doi:10.1186/1743-422X-7-199**
- Mwiine, F.N., Ayebazibwe, C., Olaho-Mukani, W., Alexandersen, S., Balinda, S.N., **Masembe, C.**, Okurut, A.R.A., Christensen, L.S., Sorensen, K.J., Tjornehoj, K., 2010b, Serotype Specificity of Antibodies against Foot-and-Mouth Disease Virus in Cattle in Selected Districts in Uganda. *Transboundary and Emerging Diseases*, 57, 365-374.
- Sangula, A.K., Belsham, G.J., Muwanika, V.B., Heller, R., Balinda, S.N., **Masembe, C.**, Siegismund, H.R., 2010b, Evolutionary analysis of foot-and-mouth disease virus serotype SAT 1 isolates from east Africa suggests two independent introductions from southern Africa. *Bmc Evolutionary Biology* 10, 371.
- Mwiine, F.N., Ayebazibwe, C., Olaho-Mukani, W., Alexandersen, S., Balinda, S.N., Masembe, C., Okurut, A.R., Christensen, L.S., Sorensen, K.J., Tjornehoj, K., 2010a, Serotype specificity of antibodies against foot-and-mouth disease virus in cattle in selected districts in Uganda. *Transboundary and Emerging Diseases*, 57, 365-374.
- Lorenzen, E.D., **Masembe, C.**, Arctander, P., Siegismund, H.R., 2010, A long-standing Pleistocene refugium in southern Africa and a mosaic of refugia in East Africa: insights from mtDNA and the common eland antelope. *Journal of Biogeography* 37, 571-581.

Some Grants and Projects Awarded

1. Understanding the Persistence of Foot-and-Mouth Disease in Uganda: the case of western Uganda (**RUFORUM**). (2009).
2. Next generation methods to preserve farm animal biodiversity by optimizing present and future breeding options (**EU-FP7**). (2010).
3. A landscape population genomics approach for conservation of the domestic pig and control of African swine fever in Uganda (Makerere - Sida). (2011).
4. Fisheries and aquaculture adaptation and conservation strategies in Uganda's changing climate (**RUFORUM**). 2010.
5. Linnaeus-Palme Exchange Programme between Makerere University and the Department of Biomedical Sciences and Veterinary Public Health (BVF) at the Swedish University of Agricultural Sciences (SLU). (Linnaeus-Palme) 2011.
6. Swedish Research Links to Understanding the dynamics and spread of African swine fever in Uganda (Sida) 2011
7. Public Health & Tropical Medicine fellowship (**Wellcome Trust**): The transmission dynamics of African swine fever in Uganda. 2015
8. Population genetics of traditional goats: NARO. 2014