POSTGRADUATE STUDENT WEBSITE PROFILE

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| Registration Number | J87/53322/2018 |
| Level (Masters / PhD) | PhD |
| Full Names | Dr. Wilkister Nakami Nabulindo |
| Clear half body Photo  (Not the face only ) | C:\Users\Morris\Pictures\Graduation photos\uon profile 3.jpg |
| Student Short Biography  (Max 250 words) | Dr. Nakami is a Veterinary surgeon, a theriogenologist /Animal reproduction specialist currently teaching at the Faculty of Veterinary Medicine, Clinical Studies Department as a Lecturer. She holds both a PhD, masters’ and bachelors’ degree in veterinary medicine from the University of Nairobi. Her key area of interest are: assisted reproductive technologies in livestock: superovulation, in vitro embryo production, embryo transfer, genome editing of cells, culture and propagation of germline stem cells She Phd research was carried out at International Livestock Research Institute (ILRI) in collaboration with Washington State University. The PhD research aimed to generate genetically edited surrogate bucks for use as breeding vehicle in goat populations in arid and semi-arid areas of Kenya. She has authored and co-authored publications in peer reviewed journals. |
| Thesis Title | SPERMATOGONIAL STEM CELL CULTURE, TRANSFECTION AND  INTRA-TESTICULAR TRANSPLANTATION AS A PRELIMINARY  TOOL TOWARDS OBTAINING GENETIC MODIFICATION OF  KENYAN GALLA GOAT |
| Thesis Abstract  (Max 250 words) | The continuous production of spermatozoa relies on the capacity of Spermatogonial stem cells (SSCs) to undergo self-renewal to maintain a reservoir for future production. SSC has been previously isolated from testes and transplanted to homologous recipients, successfully re-establishing donor-derived spermatogenesis. This unique characteristic of SSC can be exploited as a reproductive tool in livestock production to propagate desirable genetics through SSC transplantation to surrogate sires. However, the initial population of SSC isolated from the testis is usually low; therefore, there is a need to optimize methodologies for their in vitro propagation to generate enough numbers for their use in these reproductive technologies. Surrogate sires are ideal recipients for SSC transplantation since they do not possess an endogenous germline layer, but they have functional somatic cell structural support. The aim of the current study was (a) to establish long-term SSC culture system for indigenous Galla goats in Kenya and characterize the SSC through morphology, immunochemistry, and molecular markers, (c) to optimize gene transfection protocols for the in vitro cultured SSC and (d) to transfer (transplant) SSC to germline intact prepubertal bucks and evaluate their ability to colonize the recipient seminiferous tubules. The SSC was isolated from prepubertal goat testes and multiparameter selection yielded a population of cells enriched for SSC with higher in vitro colony formation, cells of uniform size, cultures with very few somatic cells, and a majority (69.20 ± 1.0 %) of the cells stained positive for promyelocytic leukaemia zinc finger factor (PLZF), which is a specific SSC marker to ascertain their stem status through immunocytochemistry and real-time polymerase chain reaction (qPCR). The cultured SSC were transfected with enhanced green fluorescent protein (eGFP) reporter gene plasmid bound to cytomegalovirus (CMV) promoter and delivered to the cell cytosol through lipofectamine reagents and electroporation. The use of Lipofectamine™ stem reagent carrier had a higher number of SSC colonies expressing the eGFP gene (25.25%) compared to Lipofectamine™ 2000 carrier molecule (22.25%). An enriched population of cultured and eGFP transfected SSC has successfully been transplanted to prepubertal buck testes through mediastinum testis in an ultrasound-guided injection. The presence of eGFP-expressing cells in seminiferous tubules of recipient testis following transplantation in prepubertal bucks indicates that the ultrasound-guided transplantation of donor cells was successful. The devised goat SSC culture system also marks the first report of culturing SSC in livestock in Africa. The established conditions can be used as a benchmark for further studies in the long-term expansion of goat SSC that will provide enough numbers for SSC in surrogate sire breeding technology. |
| Student’s Google scholar link  (affiliated to student’s university email) | https://scholar.google.com/citations?user=PbnHU5YAAAAJ&hl=en |
| Other relevant academic links | <https://profiles.uonbi.ac.ke/Wilkister> Nakami. . |
| Research Supervisors | Prof. James Nguhiu-Mwangi  Prof. Stephen Kemp  Dr. Ambrose Kipyegon |