# Lesley Bell-Sakyi – the Tick Cell Biobank

Autobiographical sketch / January 2018

I was born in Edinburgh, Scotland, the youngest daughter of a biochemist and a medical doctor/physiologist. At a very young age I remember being allowed to draw pictures on my father's lab floor at the Poultry Research Centre using water squirted from the $H_20$ (but not the $H_2SO_4$) bottle, and playing with my mother's skull and half-skeleton (acquired during her medical student days). A career in science obviously beckoned, though its direction did not become clear until after I had graduated with a BSc in Biology (with an emphasis on botany) from the University of Aberdeen in 1975. In my first job, a one-year technical position in the Institute for Animal Genetics at the University of Edinburgh, I learned tissue culture; on the strength of this, and turning up for my interview on a very large motorcycle, I was appointed as a laboratory technician at the Centre for Tropical Veterinary Medicine, Royal (Dick) School of Veterinary Studies. My job was, among other things, to develop tick cell lines that would support growth of *Theileria*, a protozoan haemoparasite of cattle. I soon discovered that *in vitro* study of the tick stages of *Theileria* was better suited to the tick organ culture systems that I developed for my MPhil degree, obtained in 1983, but I persevered with tick cell line establishment "on the side". In those days, a lab technician with a Bachelor's degree was a rarity, but one with a Master's degree was unknown, so the university promoted me to the academic staff and I spent the next 21 years working as a Research Associate. The very slow process of tick cell culture continued alongside other, more immediately rewarding, studies on ticks and tick-borne protozoa and bacteria. I was seconded to the Ghana Government Veterinary Services Department between 1994 and 1997 to work on the epidemiology of heartwater (*Ehrlichia ruminantium* infection) and other tick-borne diseases of domestic ruminants in Ghana. This led to a PhD by publications from Utrecht University in 2004 and promotion (at last) to Research Fellow.

By this time I had established 20 continuous cell lines from six tick species and was actively seeking starting material for more attempts. I should mention that it takes between one and seven years to establish a continuous tick cell line, and the success rate is, on average, less than 10%. In the mid-2000s, the number of active scientists with the required expertise worldwide numbered less than the digits on one hand, and we were all getting on in years. The major culture collections (ECACC and ATCC) had been unable to maintain and supply tick cell lines deposited therein by me and my American colleagues and there began to be a real risk that the body of tick cell lines and associated expertise built up over the previous 40 years could be lost. I therefore teamed up with

Profs Uli Munderloh and Tim Kurtti of the University of Minnesota, Dr Pat Holman of Texas A&M University, and two interested Edinburgh arbovirologists to set up the Tick Cell Biobank with Wellcome Trust Biomedical Resource funding. Our aim was to provide not only a safe, long-term repository for the world's tick cell lines, but also training in their generation and maintenance in order to facilitate uptake of tick cell technologies by the international research community. In 2012 the Biobank and I moved to The Pirbright Institute and then in 2017 to the University of Liverpool's Institute of Infection and Global Health. We are now funded by the UK government BBSRC Global Challenges Research Fund; we hold over 60 cell lines derived from 17 tick species with more in the pipeline, and we are branching out into generating cell lines from other "neglected" arthropod vectors including midges, mites and sand flies. The Tick Cell Biobank has been a huge success, to date disseminating tick cell lines to 76 research institutes in 31 countries and training 86 young scientists. I look forward to at least five more happy years with my "wee cells" before I have to think about retiring and handing them over to the next generation of invitromaticists!

**Cell lines established by Lesley Bell-Sakyi**

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| ARE/LULS41 (CVCL_UD42) | AVL/CTVM13 (CVCL_Z140) | AVL/CTVM17 (CVCL_Z141) |
| BDE/CTVM12 (CVCL_Z142) | BDE/CTVM14 (CVCL_Z143) | BDE/CTVM16 (CVCL_Z144) |
| BME/CTVM2 (CVCL_Z145) | BME/CTVM4 (CVCL_Z148) | BME/CTVM5 (CVCL_Z149) |
| BME/CTVM6 (CVCL_Z150) | BME/CTVM23 (CVCL_Z146) | BME/CTVM30 (CVCL_Z147) |
| CNE/LULS44 (CVCL_ZU87) | CNE/LULS47 (CVCL_ZU88) | CPE/LULS50 (CVCL_C1YI) |
| DRE/LULS60 (CVCL_C1GP) | HAE/CTVM7 (CVCL_Z153) | HAE/CTVM8 (CVCL_Z154) |
| HAE/CTVM9 (CVCL_Z155) | HAE/CTVM10 (CVCL_Z151) | HAE/CTVM11 (CVCL_Z152) |
| HAE/CTVM15 (CVCL_Z234) | HLE/LULS42 (CVCL_C1GQ) | HLE/LULS43 (CVCL_C1GR) |
| HLE/LULS48 (CVCL_C1GS) | HSE/LULS51 (CVCL_C1GT) | HSE/LULS59 (CVCL_C1GU) |
| IRE/CTVM18 (CVCL_Z156) | IRE/CTVM19 (CVCL_Z157) | IRE/CTVM20 (CVCL_Z158) |
| IRE/LULS55 (CVCL_C1GW) | LLE/LULS40 (CVCL_UD49) | LLE/LULS45 (CVCL_C1YJ) |
| LLL/LULS52 (CVCL_C1YK) | OME/CTVM21 (CVCL_Z172) | OME/CTVM22 (CVCL_Z173) |
| OME/CTVM24 (CVCL_Z174) | OME/CTVM25 (CVCL_Z175) | OME/CTVM26 (CVCL_Z176) |
| OME/CTVM27 (CVCL_Z177) | PPL/LULS49 (CVCL_C1YM) | PPL/LULS49/wPap (CVCL_C1YL) |
| RAE/CTVM1 (CVCL_Z159) | RAN/CTVM3 (CVCL_Z160) | RBE/LULS58 (CVCL_C1GX) |
| RPE/LULS53 (CVCL_C1YN) | REE/CTVM28 (CVCL_Z206) | REE/CTVM29 (CVCL_Z207) |
| REE/CTVM31 (CVCL_Z208) | REN/CTVM32 (CVCL_DC00) | RSE/PILS35 (CVCL_RN45) |