

Obituary: Siv Aina Jensen Leendertz (Born Siv Aina Jensen: 1973–2018)

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It is with great sadness that we announce the passing of our colleague and friend, Siv Aina Jensen Leendertz. Despite her young age and having taken time off to raise her three children, Siv Aina was an accomplished veterinarian, biologist, and virologist who made insightful contributions to our understanding of wildlife disease ecology and great ape health. Siv Aina always had a love for animals and devoted much of her work towards their conservation and she is thoroughly missed by a diversity of communities. Most recently, she worked at the Robert Koch Institute in Germany, but her career began with a Bachelor of Veterinary Science at the University of Liverpool. She then worked practically as a veterinarian in England at the Armac Veterinary Clinic and from there, went on to work as a Research Assistant at the Liverpool School of Tropical Medicine. This position involved a two year project based full-time in Cameroon, where she developed her passion for helping both animals and humans. Here, she almost singlehandedly ran the first study on recombinant vaccination against onchocerciasis (or “river blindness” – a major neglected tropical disease affecting 25 million people, mostly in sub-saharan Africa) in a cattle model for her Master of Philosophy at the University of Liverpool (Tchakouté* *et al.* 2006), using parasite antigens produced at Smith College, Massachusetts. She then worked in a number of animal clinics in

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Norway gaining practical experience at the Aasiden Animal Clinic and the Kongsberg Small Animal Clinic, before immersing herself in the world of non-human primates at the Limbe Wildlife Centre, Cameroon. This work kindled a love for great apes, which she pursued through a PhD combining work at the Norwegian School of Veterinary Science in Norway, the Max Planck Institute for Evolutionary Anthropology, and the Robert Koch Institute, in Germany, where she thrived. Her work with great apes led her to work extensively in the field of human health, as the close relatedness of non-human primates and humans make them both sources of pathogens that can emerge into human populations, but also susceptible to human pathogens that cause mortality in great apes.

Her work with great apes brought her to the Côte d'Ivoire, working with the Taï Chimpanzee Project in the Côte d'Ivoire in remote field conditions and closely with Ivorian colleagues. This work was interdisciplinary and pushed the boundaries of our understanding of the ecology and evolution of important wildlife pathogens including sylvatic anthrax, ebolaviruses, retroviruses, and orthopoxviruses. She made creative contributions in developing methods to study wildlife populations and advocated for linking her expertise in wildlife diseases with great ape conservation. To this end, she described a diversity of pathogens circulating in non-human primate populations, including polyomaviruses, *Clostridium septicum*, and retroviruses (Leendertz *et al.* 2010). Through her meticulous work, she showed that some, but not all, pathogens readily cross the species boundary between a non-human primate predator (chimpanzee; *Pan troglodytes verus*) and their prey (red colobus; *Piliocolobus badius*), providing insights into the transmission of microorganisms between humans and their primate prey, as well as a better understanding of human disease risk (Leendertz *et al.* 2010; Leendertz *et al.* 2011).

She then expanded her work to involve humans living in proximity to wildlife populations, particularly in sub-Saharan Africa. Building on her understanding of the microorganisms circulating in wildlife populations, she used genetic and serological approaches to understand the risk and active spillover of pathogens into human populations; from a recent serosurvey in the Côte d'Ivoire and the Democratic Republic of the Congo examining exposure to orthopoxviruses, to studies of human contact to non-human primates as risk factors for disease emergence in the Taï region, to studies of the diversity of cytomegaloviruses and adenoviruses circulating in Sub-Saharan Africa, to work in a team linking the human T-lymphotropic virus type 1 to wildlife populations, and studies of the wildlife populations that may have given rise to the large West-African ebolavirus disease outbreak. Throughout this work she took on the role of training students and collaborating with researchers from a large diversity of countries and designing studies to address important question for conservation and public health.

While spillover of wildlife pathogens into human populations was a major passion, she was keenly aware of the risk that human pathogens pose for great ape populations; for example, she worked on studies of spillover of human respiratory pathogens into chimpanzee populations and played a role in developing best practice guidelines for health monitoring and disease control in great ape populations. She worked tirelessly to understand factors driving the decline

of wild great ape populations; from her studies of anthrax devastating chimpanzee populations in Taï National Park, to understanding ebolaviruses and their continued emergence into great ape populations. Through her work, she was not afraid of being controversial and pushing the boundaries of our knowledge; this is well illustrated by her continued challenging of the dogma that fruit bats are the sole reservoir of Ebolaviruses and her loud call for increasing research into a broader range of potential reservoir species (Leendertz 2016; Leendertz* *et al.* 2016).

Siv Aina was a caring generous colleague, dedicated to training and sharing her skillset and went above and beyond the call of duty to help colleagues in early stages of their careers. She was willing to share authorship with her younger colleagues rising in the ranks and took this shared authorship seriously, contributing actively in ways to help train the next generation of scientists so they could ultimately write well on their own. As a strong woman and scientist, she was an advocate for women in science and for finding ways to facilitate their work in remote field conditions. She was a role model for many, having trained countless students and her contributions were important and the loss of such an intelligent and generous colleague will leave a lasting void in our community.

SIV AINA REMEMBERED

In the supplementary material, some of Siv Aina's colleagues remember her as a scientist, mentor, and friend from different chapters in her life.

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