

# Isabella Eckerle – a passion for zoonotic viruses

Autobiographical sketch / June 2019



As a child already I was fascinated by nature. Growing up in a rather rural area in Southwestern Germany, I loved to be outside and collect plants and animals, and wanted to be either a veterinarian or field biologist. However after school, I decided for human medicine. During my final year in Medical School in Heidelberg, I travelled to Africa for the first time, and there I immediately knew that I wanted to work in the field of infectious diseases with a

focus on tropical pathogens, and nothing else! So my first job as a junior doctor was at the Tropical Medicine Unit in Heidelberg, where I became curious to study the huge variety of pathogens that have to be considered in returning travelers, in particular those with a zoonotic origin. Among them, especially bats as reservoirs of viruses such as rabies, Ebola, SARS- and MERS-CoV have fascinated me, and still do!

In 2011, I joined the group of Christian Drosten at the Institute of Virology in Bonn, to work on emerging zoonotic viruses, which still is THE most exciting research field I can think of. In his lab, there was already ongoing work on bat cell lines when I joined, so I could immediately start my own project with a focus on airway and renal epithelial cell lines from reservoir hosts: first from bats, then also from rodents and insectivores, as well as from livestock species such as horses and camels. By developing a method to freeze organ specimens in the field, I could gain access to a large variety of rare and interesting species, and isolate primary cells, which I later immortalized to generate infinite cell lines. Most tissue samples were collected through an existing network of field biologists, but for some species we had to be more creative: for example, make use of “road-kill” and “cat-kill” (e.g. for European hedgehog and several shrew specimens). So, colleagues frequently brought me freshly deceased animals that they had found on the patio or on the roadside on their way to work.

For some projects, e.g. in Ghana and Gabon, I could also accompany bat biologists during their fieldwork - something that I enjoyed tremendously! And actually doing fieldwork really helps you appreciate the value of samples from wild animals, and the immense effort it takes to collect them! Just imagine: a heavy dry-shipper carried several kilometers through the rainforest, night after night sitting under a mist net waiting for bats, the risk of bites and scratches and pee in the face from potential Ebola reservoirs, and lots of nasty biting bugs on top. By this, I could collect tissue to establish cell lines

from a multitude of bats, rodents, insectivores and some more livestock hosts during my time in Bonn.

What I really love about the work on these exotic cell lines: to create a completely new model system for a reservoir host which has not been there before, and that can be expanded and used infinitely! Also, since we could adapt our immortalized cells to standard cell culture media, we were able to share them with a vast number of other research groups for the study on many different viruses, all working on a common goal: to elucidate the mystery of bats and viruses! And I think it is a very valuable approach to share, and enable as many researchers as possible to work with a model for such a rare and delicate animal as a bat.



Since 2018 I am now Professor at the Geneva Centre for Emerging Viruses and here the work on exotic cell lines will continue! At the Department of Microbiology and Molecular Medicine, where my new research lab is now located, I got to know Amos Bairoch, who is as enthusiastic about unusual cell lines as I am, and learned about the Cellosaurus which contains entries describing our cell lines.

I am convinced that with a continuous increase of emerging and re-emerging viral diseases, virologists working on zoonotic viruses will not be out of work soon. And maybe one of our cell lines can add a little piece to the fascinating puzzle of bats and zoonotic viruses!

### Cell lines established by Isabella Eckerle's group

CarperAEC.B-1 ( <a href="#">CVCL_QW39</a> )	Crocsu-Lu ( <a href="#">CVCL_RX46</a> )	EidheAEC.B-3 ( <a href="#">CVCL_QW40</a> )
MyglaAEC.B ( <a href="#">CVCL_RX02</a> )	ShispAEC.B-2 ( <a href="#">CVCL_RW86</a> )	ShispREC.B-6 ( <a href="#">CVCL_RW87</a> )