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In vivo tracking of measles vaccine: Playing with new imaging tools

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Measles vaccine (MV) is a live attenuated virus derived from the Schwarz strain. This vaccine is very safe and effective; it also confers a strong and prolonged protection against measles infection. Using reverse genetic, it is very convenient viruses that accommodate long sequences coding for different proteins. Therefore, MV platform is currently used for the development of new vaccines against Chikungunya or Zika viruses with very promising results. Vaccination still remains an empiric process and there is a gap of knowledge between vaccine development and basic knowledge of immune response. To explore cellular and molecular processes involved during vaccination, we used MV platform to develop new imaging tools. We constructed fluorescent viruses to follow *in vivo* the infection and the host response after MV injection. Combining different fluorescence tools with bi-photonic microscopy, we were able to obtain *in vivo* images to identify the immune cells at the early stages of intra-muscular injection. In parallel, we also developed a new animal model for vaccinology based on crossing mice with subpopulation of immune cells fluorescently labeled and IFNAR mice (that are permissive for MV infection). In this model, by using bi-photonic microscopy we have developed dynamic imaging with a rapid identification and quantification of the cells involved in vaccine response.

Biography

Emmanuelle Billon-Denis has been working for more than ten years in the field of protein biochemistry, especially fluorescent proteins. She's interested in the development of new tools for in vivo imaging, especially to investigate host-pathogen responses. Using different types of microscopy, she's studying cellular processes involved in the response to infection. Now she's working for the development of new animal models adapted to the study of vaccine response in a dynamic context.

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