OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Vaccines & Vaccination
September 24-26, 2014 Valencia Convention Centre, Spain

Cyclic GMP-AMP has mucosal adjuvant activity in mice

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The recently discovered metazoan enzyme cyclic GMP-AMP synthase (cGAS) produces cyclic GMP-AMP (cGAMP) upon detection of pathogen-derived double-stranded DNA. The cyclic di-nucleotide (CDN) cGAMP was shown to bind to STING (stimulator of interferon genes) thereby activating an IFN-β producing pathway. Protozoan CDNs such as c-di-AMP or c-di-GMP are known to have immune modulatory activity when used as vaccine adjuvants in mouse immunization experiments. C-di-GMP was also shown to bind to and activate STING. Here we report the activity of cGAMP as a mucosal adjuvant in mouse immunization experiments. We demonstrate its potential to promote antigen specific humoral and cellular immune responses *in vivo*. We further show that cGAMP can directly activate murine as well as human innate immune cells in vitro. Taken together our findings suggest cGAMP as a candidate adjuvant for mucosal vaccine development with potential also for human vaccines.

Biography

Christine Rueckert studied Biophysics at the Humboldt University, Berlin, Germany, and the Imperial College, London, UK. In 2000, she graduated in Experimental Biophysics at the Humboldt University, Berlin, and specialized in Molecular Cell Biology over her Postdoctoral period at the University of Virginia, Charlottesville, USA. Since 2011, she has been a project leader in the Vaccinology Department at the Helmholtz Centre for Infection Research in Braunschweig, Germany. Her research focuses on elucidating the molecular mechanisms of vaccine adjuvants at the cellular level. Her objective is to understand the contributions of specific properties of adjuvant molecules to the fine tuning of immune responses as the basis for rational vaccine design.

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