

Project Title: Optimizing In Vitro Avian B Cell Maturation and Infectious Bursal Disease Virus (IBDV) Pathotype Interaction

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Research group: [Infectious Bursal Disease Virus](#)

Project Summary:

This project aims to improve the survival, growth, and functional development of chicken B cells in the lab. By achieving this, we can better understand how immunosuppressive viruses like Infectious Bursal Disease Virus (IBDV) severely impact the B cells that are responsible for antibody-producing part of the immune system. Also, the findings will provide a foundation for developing better diagnostic tools, evaluating vaccines, and reducing the need for animal testing.

Building on previous success with chicken CD40L to support B cell cultures for extended periods, this project will explore new methods to promote B cell growth and maturation. The research has exciting potential to contribute to controlling viral diseases, improving poultry health, and advancing comparative immunology—bridging the gap between human, mammalian, and avian immune systems.

Further Details:

Infectious Bursal Disease Virus (IBDV) is a major immunosuppressive virus in chickens, associated with massive B cells depletion, the cells responsible for producing antibodies, leading to significantly weakened immune defences and increased vulnerability to other infections specially in young age.

This project will focus on optimising in vitro system (lab based) to maintain and mature chicken B cells. These optimised systems will allow us to study how B cells interact with IBDV. Additionally, these advancements could help replace some live animal experiments while deepening our understanding of viral infections and immune responses.

Key activities in this project include:

- B cells isolation from the bursa of Fabricius, a key immune organ in chickens.
- B cell culture conditions optimisation with cytokine stimulation to support cell survival and maturation.
- Testing B cell maturation stages using flow cytometry.
- Virological investigation that includes infectivity and viral titration upon infection of B cells with IBDV.
- Measure genes associated with B cell growth and differentiation using quantitative real time PCR.

The project offers hands-on experience in different fields including immunology, virology, and molecular biology, and techniques such as cell culture, flow cytometry, and quantitative PCR. These knowledge and skills will be highly valuable for careers in biomedical and veterinary sciences, making this project an excellent stepping stone for your future.

References for Suggested Reading:

- 1- Trapp, J. and S. Rautenschlein, Infectious bursal disease virus' interferences with host immune cells: what do we know? Avian Pathology, 2022. 51(4): p. 303-316.
- 2- Kothlow, S., et al., CD40 ligand supports the long-term maintenance and differentiation of chicken B cells in culture. Dev Comp Immunol, 2008. 32(9): p. 1015-26.
- 3- Dulwich, K.L., et al., An Ex Vivo Chicken Primary Bursal-cell Culture Model to Study Infectious Bursal Disease Virus Pathogenesis. J Vis Exp, 2018(140).

4- Marsman C, Verhoeven D, Koers J, Rispens T, ten Brinke A, van Ham SM and Kuijpers TW (2022) Optimized Protocols for In-Vitro T-Cell-Dependent and T-Cell-Independent Activation for B-Cell Differentiation Studies Using Limited Cells. Front. Immunol. 13:815449. doi: 10.3389/fimmu.2022.815449

To Apply:

See [How to apply](#) for details. **Closing Date:** 31/01/2025