Protective Immune Responses during Epstein Barr Virus (EBV) Infection

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EuroScholars Midstay Programme

March 12, 2015


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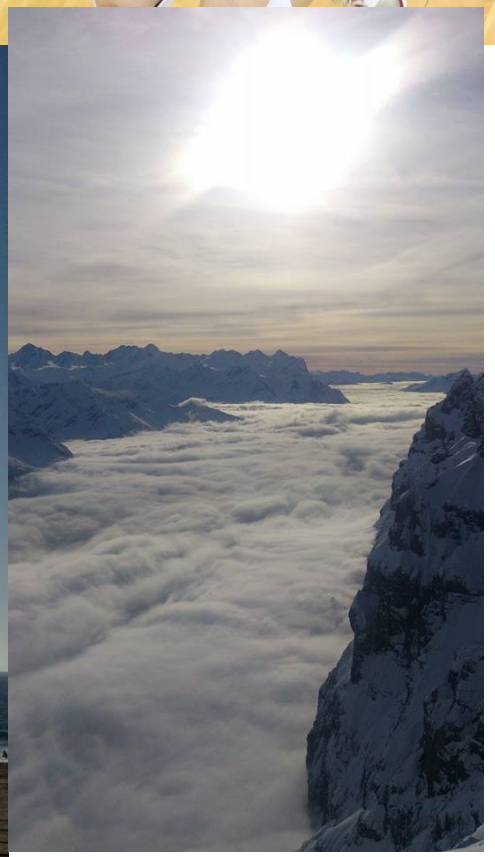
Evolving Rapamycin Resistance in Drosophila
M. Ware & W. A. Frankino, Biology & Biochemistry
Background
Results
Methodology
Conclusions



What is Epstein Barr Virus (EBV)?

- EBV is a "common human γ-herpesvirus that persistently infects more than 90% of the human adult population."[1]

- Individuals, who are infected with the virus early in life, acquire and carry the virus usually without symptoms; however, 20-30% of Europeans and North Americans are infected later during adolescence and a high proportion of these will experience symptoms during primary infection.[1]

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Infectious Mononucleosis (IM)

- EBV is the virus that causes IM, which is often referred to as “The Kissing Disease”, because it is transferred through saliva.

- The reason why some acquire EBV with IM at increased age is still unclear, but it is thought that inefficient innate immune control might allow the virus to replicate to a higher level.[1]

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Main symptoms of

Infectious mononucleosis

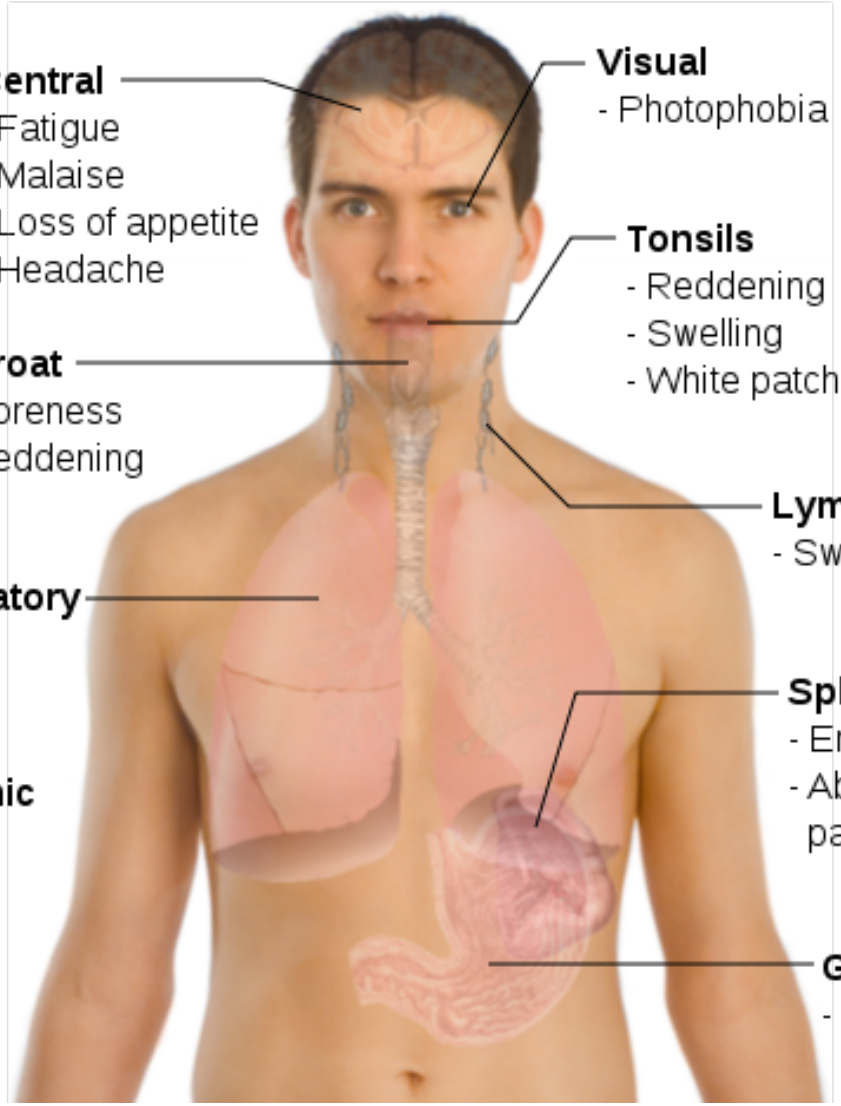

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Image from “Epstein-Barr Virus: Infectious Mononucleosis.”

Natural Killer (NK) Cells

- NK cells are lymphocytes that were originally discovered for their spontaneous cytolytic potential against tumor cells.[1]
- As part of the innate immune system, NK cell recognize altered components of the infected or transformed cell surface that indicate cellular stress like DNA damage or an unfolded protein response.[1]
- “They are antibody-independent killers of tumor cells and also can participate in antibody-dependent cell-mediated cytotoxicity.”[3]

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Natural Killer (NK Cells)

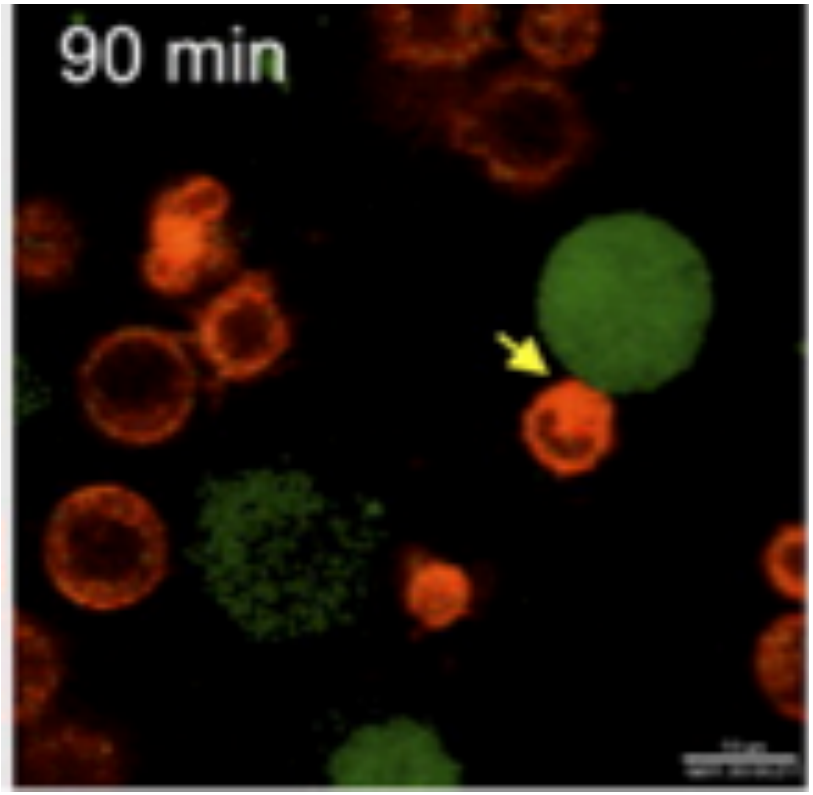

Image from Silva, et al., *Blood* (2011)

The immune response to primary EBV infection: a role for natural killer cells

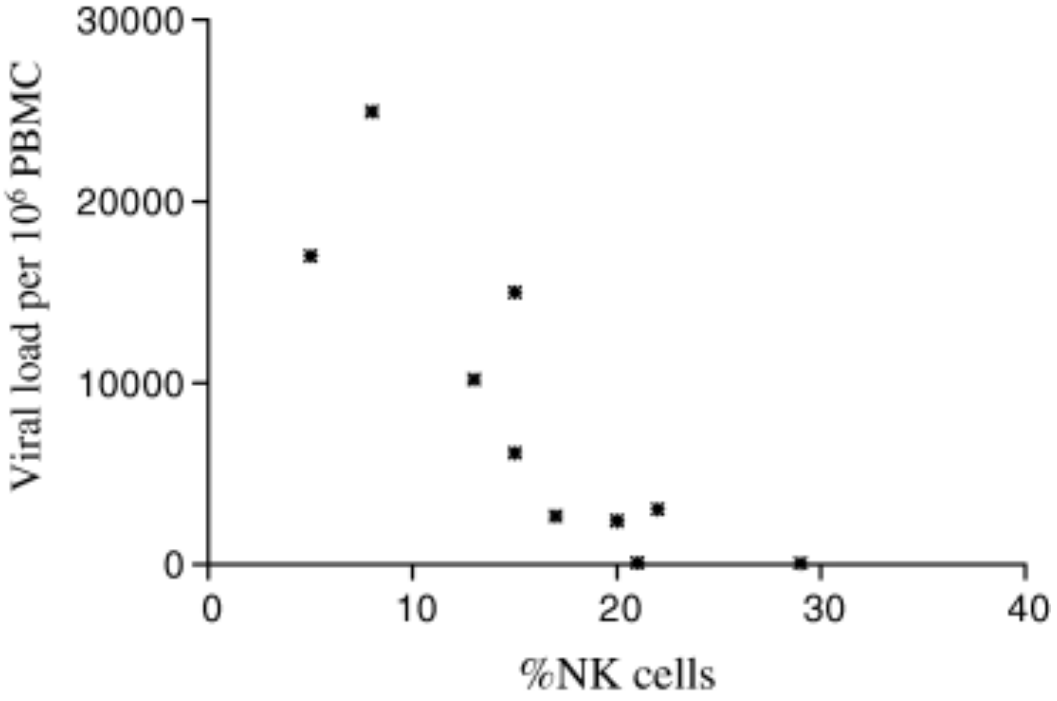

Image from Williams, *British Journal of Haematology* (2005).

Methodology of the Experiments

- Human Natural Killer cell lines NKL, NK-92, and Nishi will be exposed to EBV-infected cells.

- Using antibodies and a confocal microscope, “SP5,” the synapse between the cells will be imaged to view the interaction between the cells and the recruited receptors and their ligands.

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Aim of the Experiments

- One receptor has been identified in the specific EBV protective NK cell subset (CD94/NKG2A).
- Through imaging, I will identify other receptors and ligands that are recruited to the interaction between NK cells and EBV infected cells.
- NK receptor candidates: NKG2D and DNAM-1.

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Expected Results

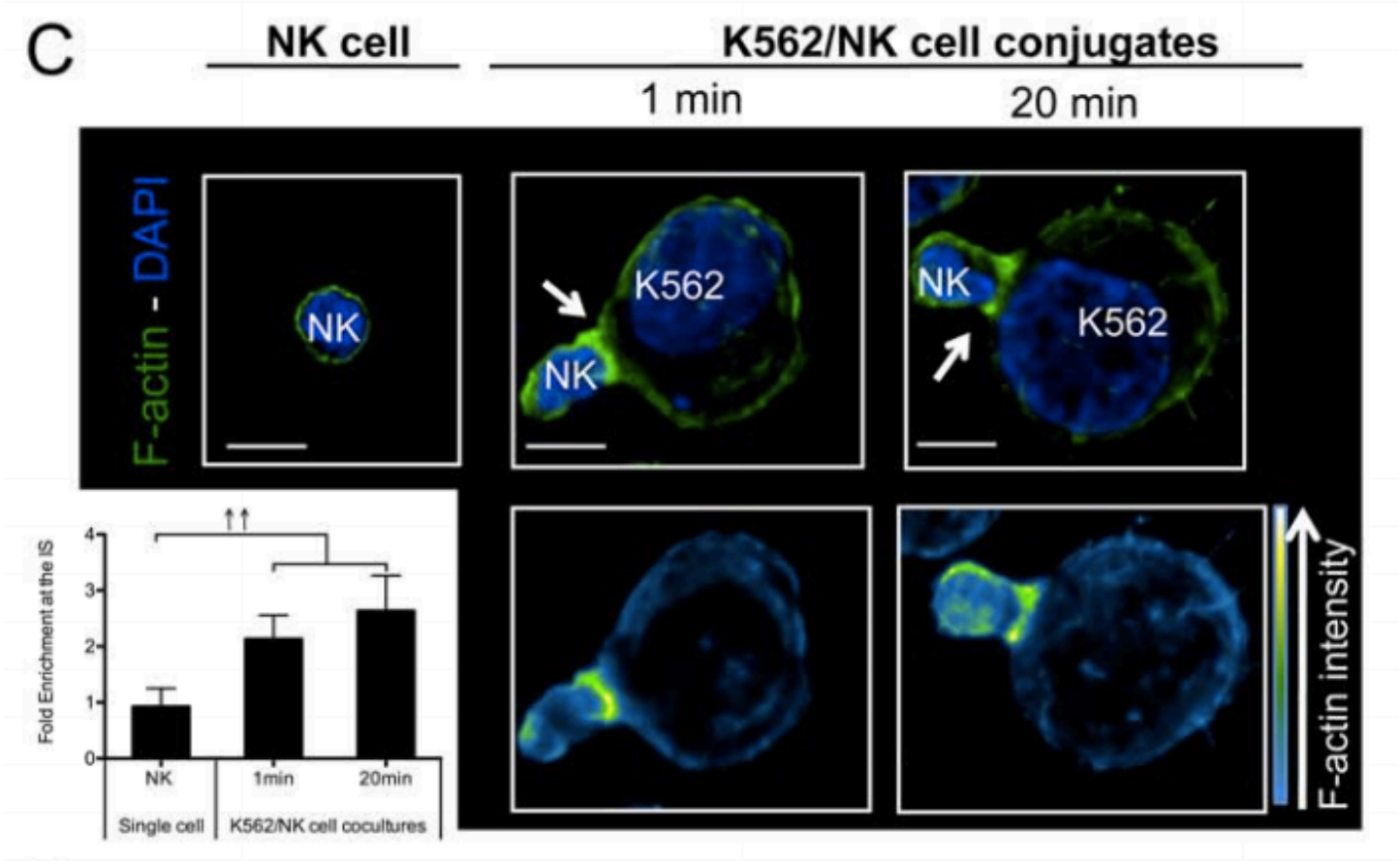

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Image from Silva, et al., *Blood* (2011).

Why is this important?

- Not much is known about the role of NK cells in primary EBV infection.

- Monitoring the human NK cell compartment could allow us to identifiy adolescents at risk for IM, which could benefit from EBV specific vaccination.[1]

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Acknowledgements

Universität Zürich[UZH]

Christian Münz

Obinna Chijioke

Vanessa Landtwig

Anita Murer

Danusia Vanoacia

Andrew Wingfield

Usha Mohunlol

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