

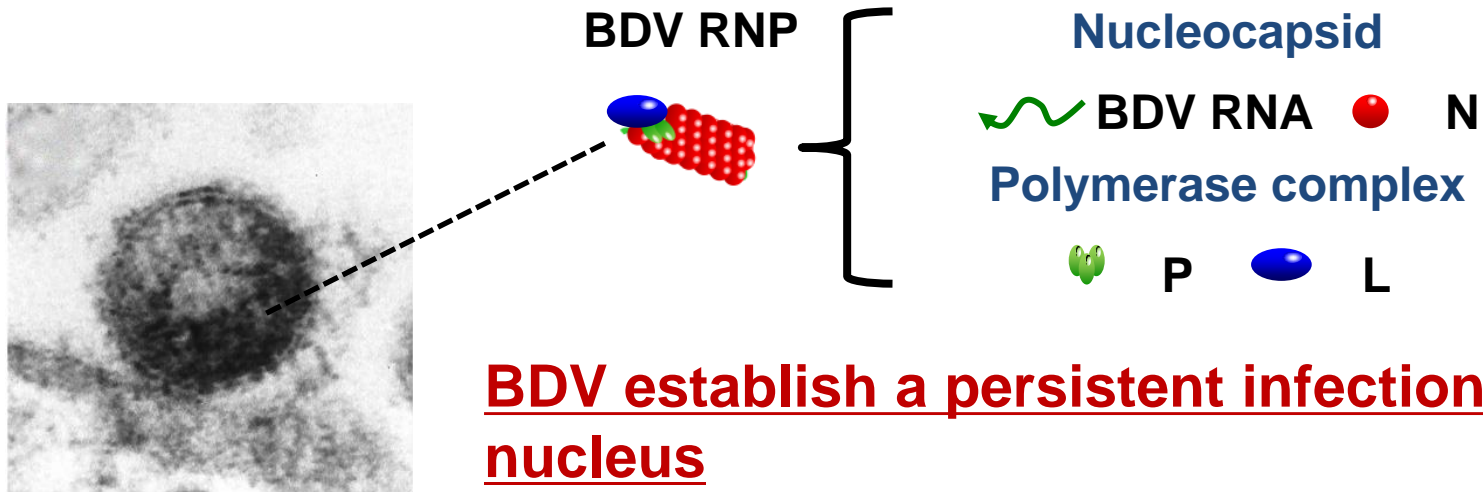
ボルナ病ウイルスと核内宿主機構

京都大学 ウイルス研究所
ヒトがんウイルス研究分野
本田 知之

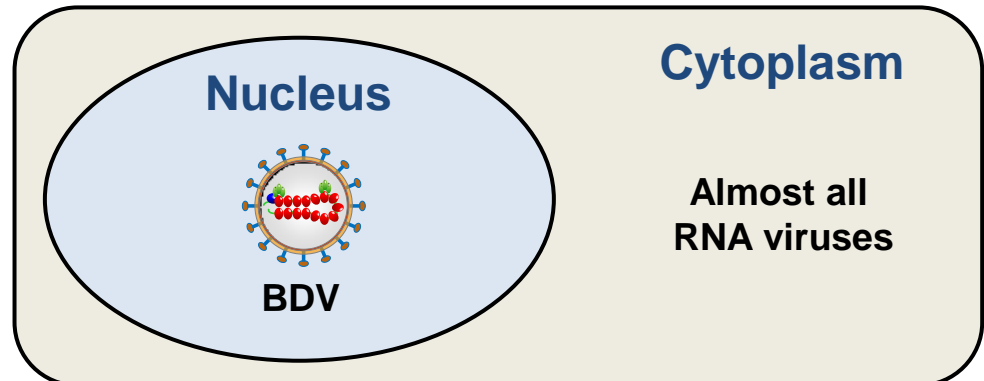


Borna Disease Virus (BDV)

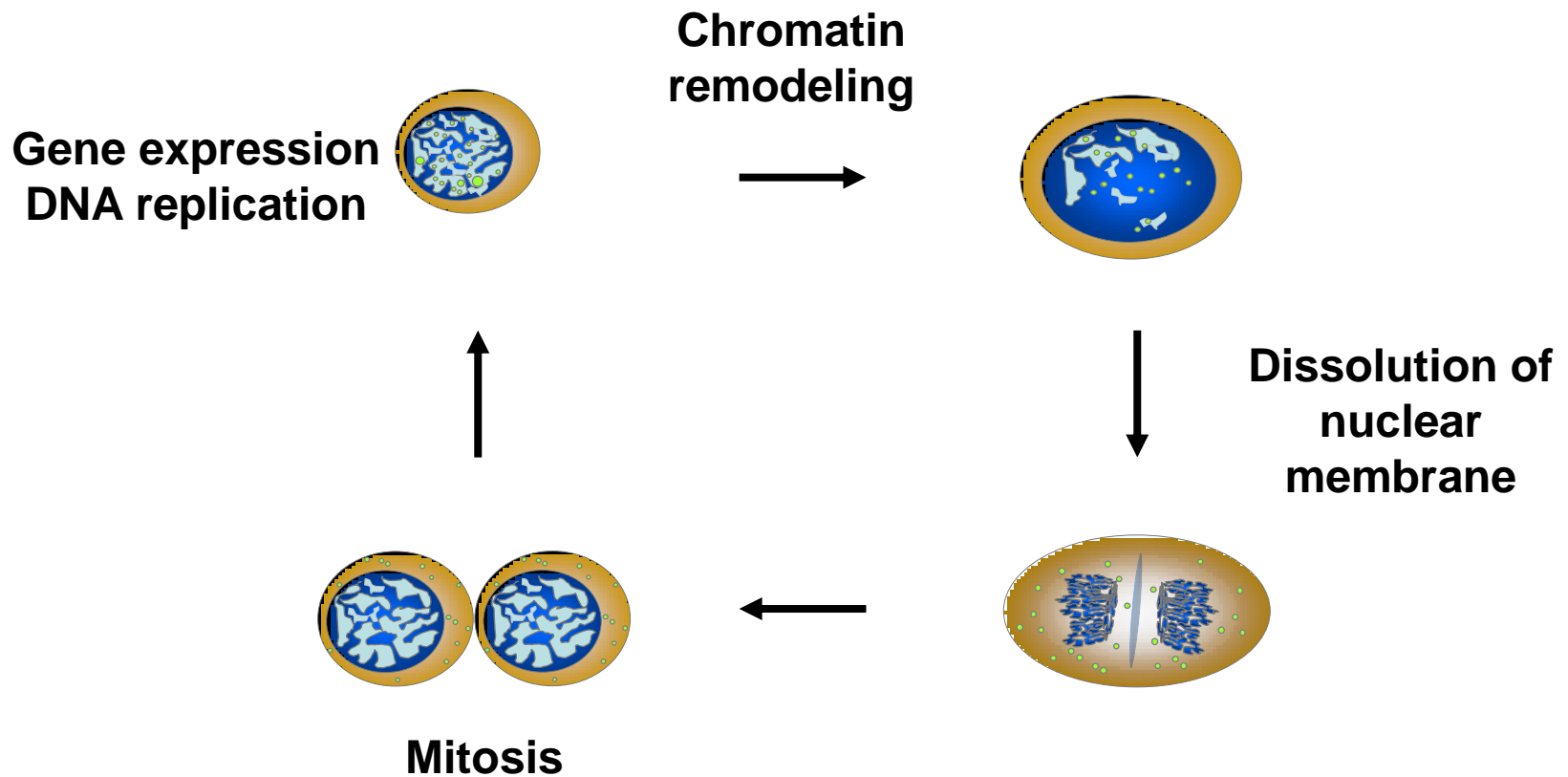
Ribonucleoprotein (RNP) is the replication complex of BDV



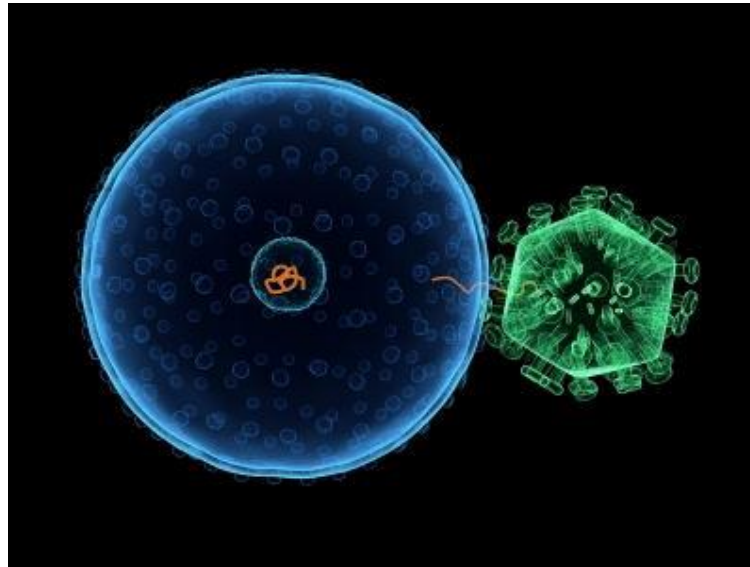
BDV establish a persistent infection in the nucleus



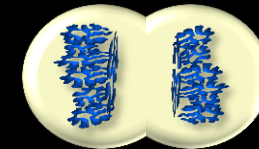
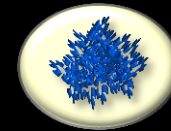
The Nucleus: a Hostile Site for RNA Virus Persistence



How does BDV establish the persistent infection in the nucleus?

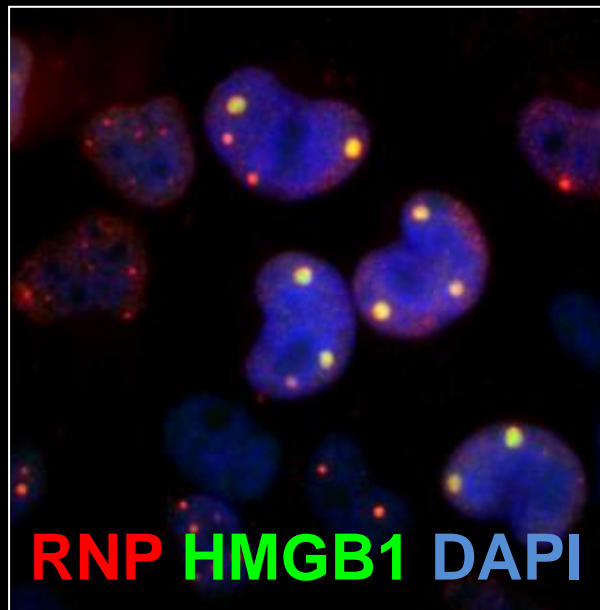


Dissociation of vRNP from the Mitotic Chromosomes by HMGB1 Knockdown

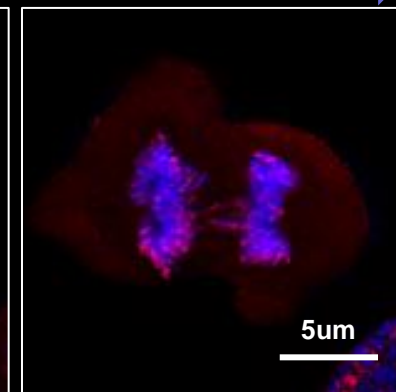
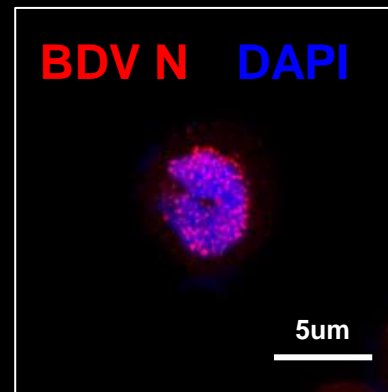


Metaphase

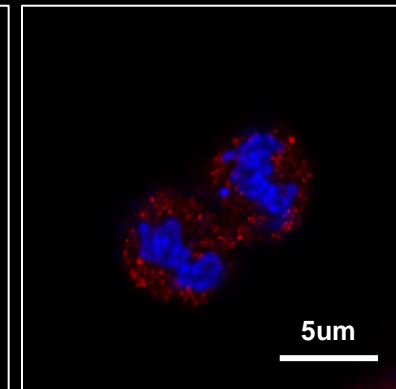
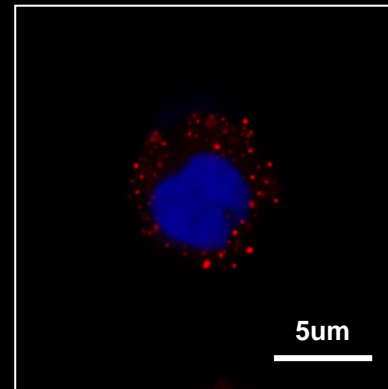
Anaphase



shControl

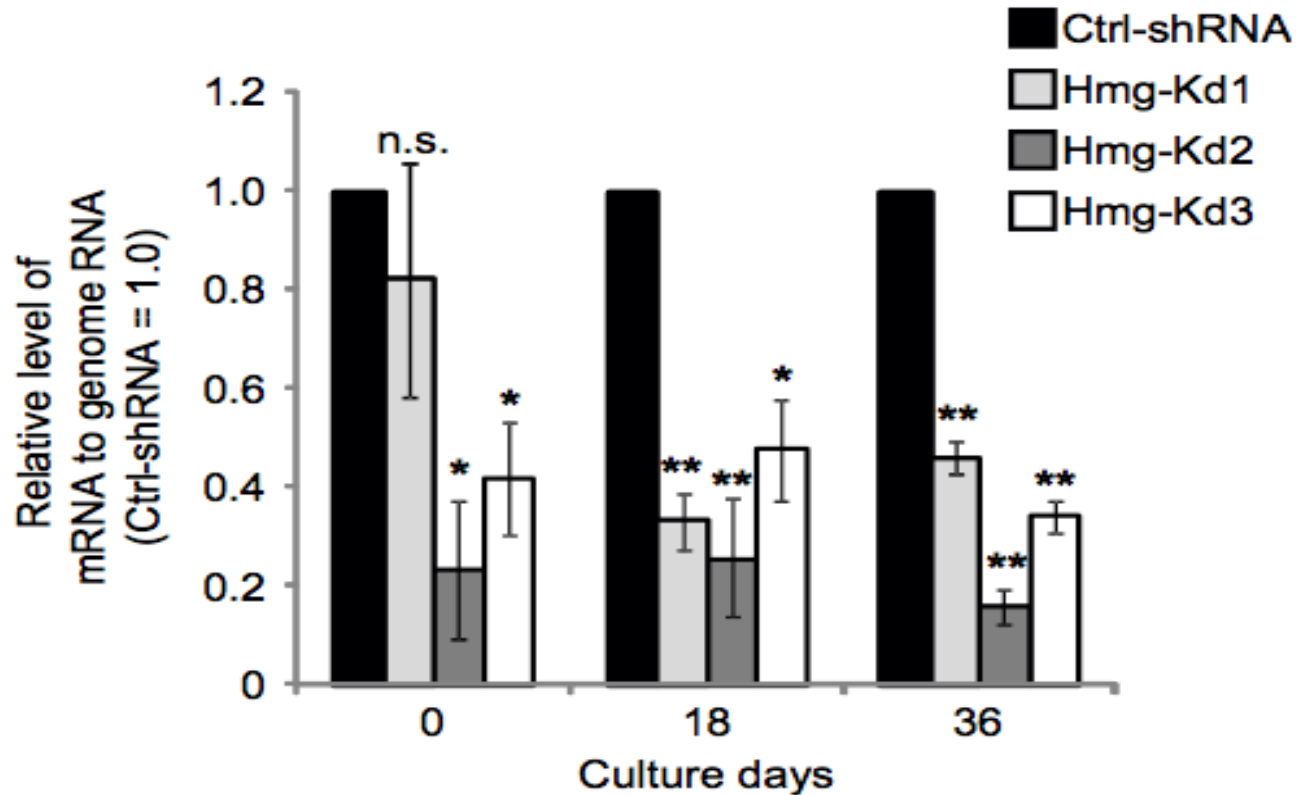


shHMGB1



(Matsumoto et al., Cell Host Microbe 2012)

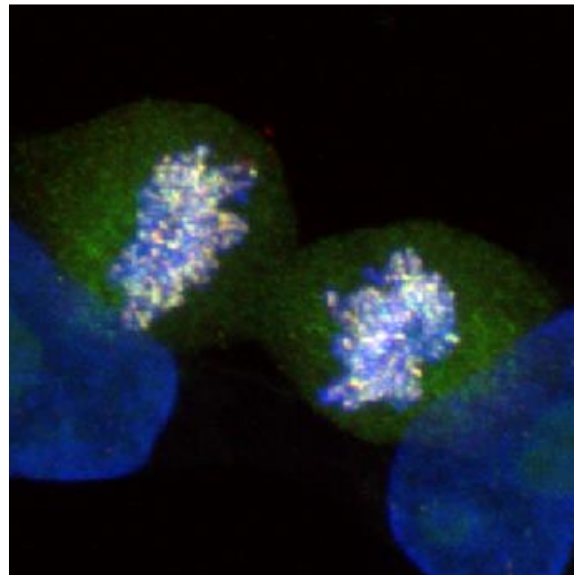
A Critical Role of HMGB1 in BDV Replication



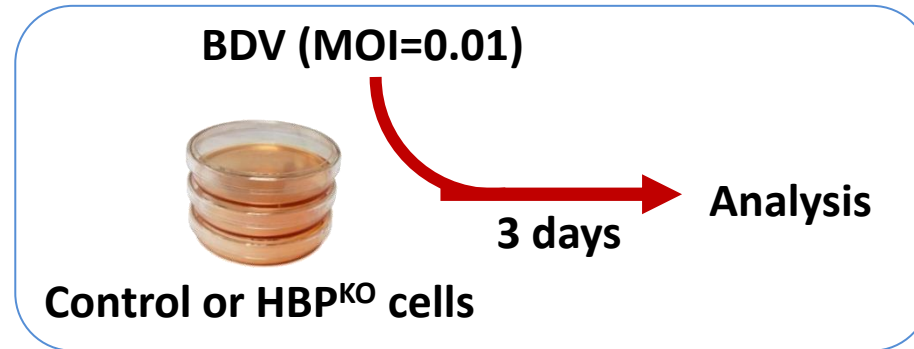
(Matsumoto *et al.*, *Cell Host Microbe* 2012)

Summary 1

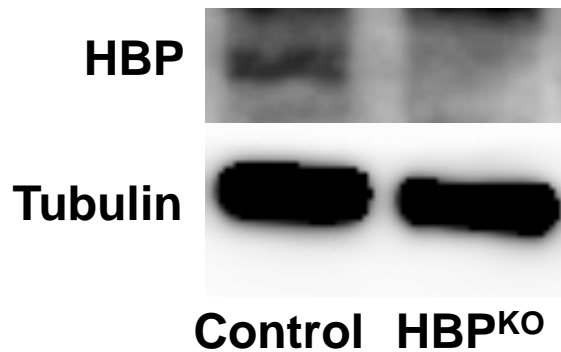
- ④ **BDV RNP interacts with chromatin throughout the cell cycle.**
- ④ **BDV uses a host factor, HMGB1 for its efficient retention of BDV RNP on the chromatin.**
- ④ **HMGB1 is required for the efficient replication of BDV.**



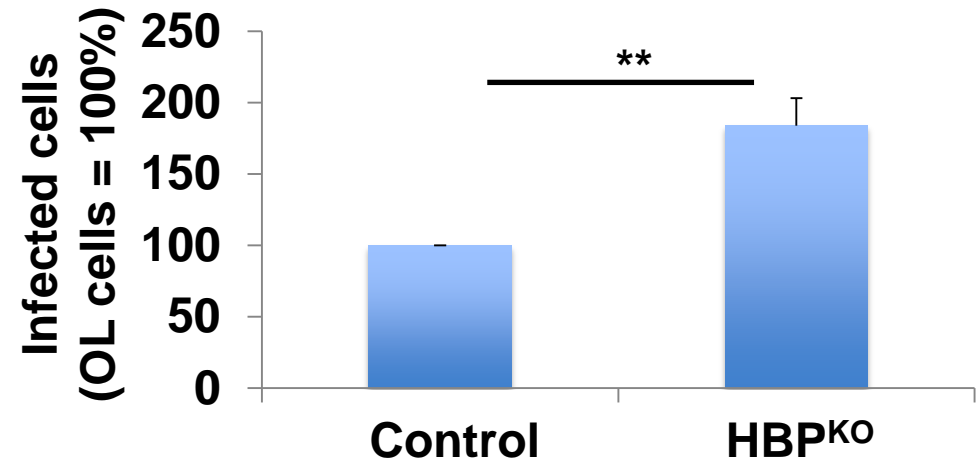
BDV Infection to HBP Knockout Cells



Western blot



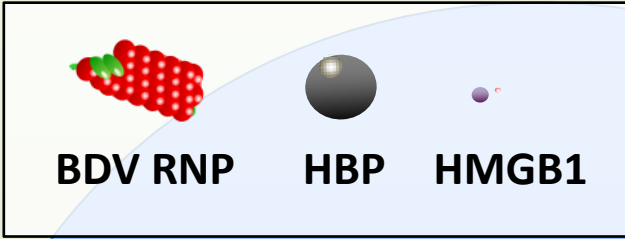
BDV infection



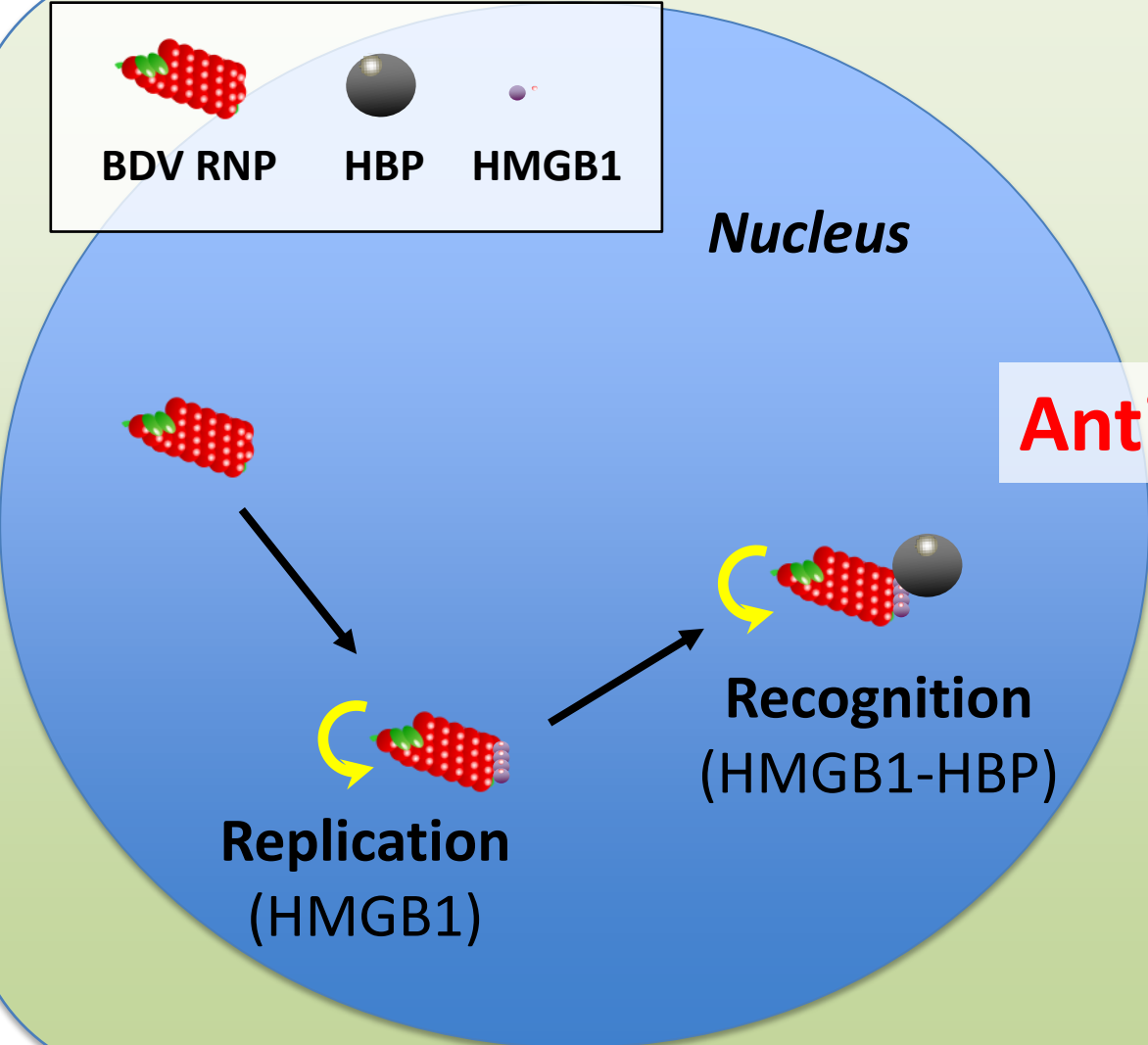
HBP, HMGB1-binding protein

** , p<0.01 (N=3)

Summary 2



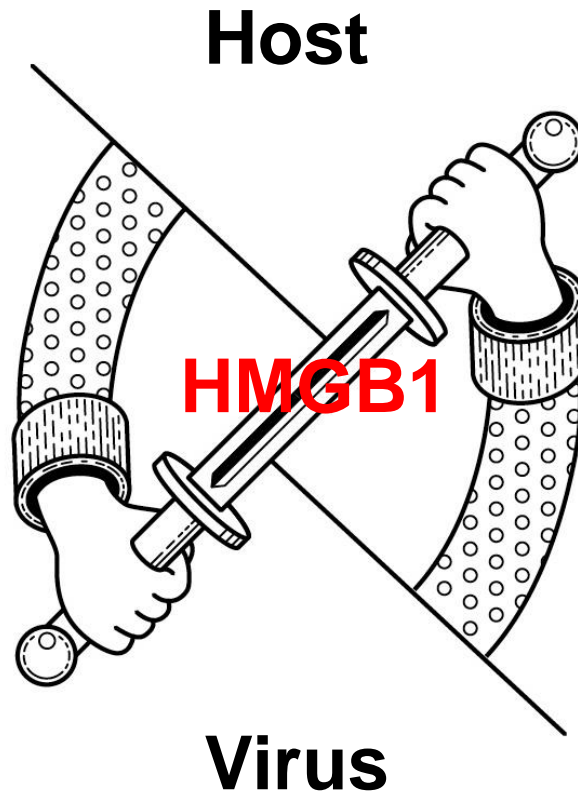
BDV RNP HBP HMGB1



Cytosol

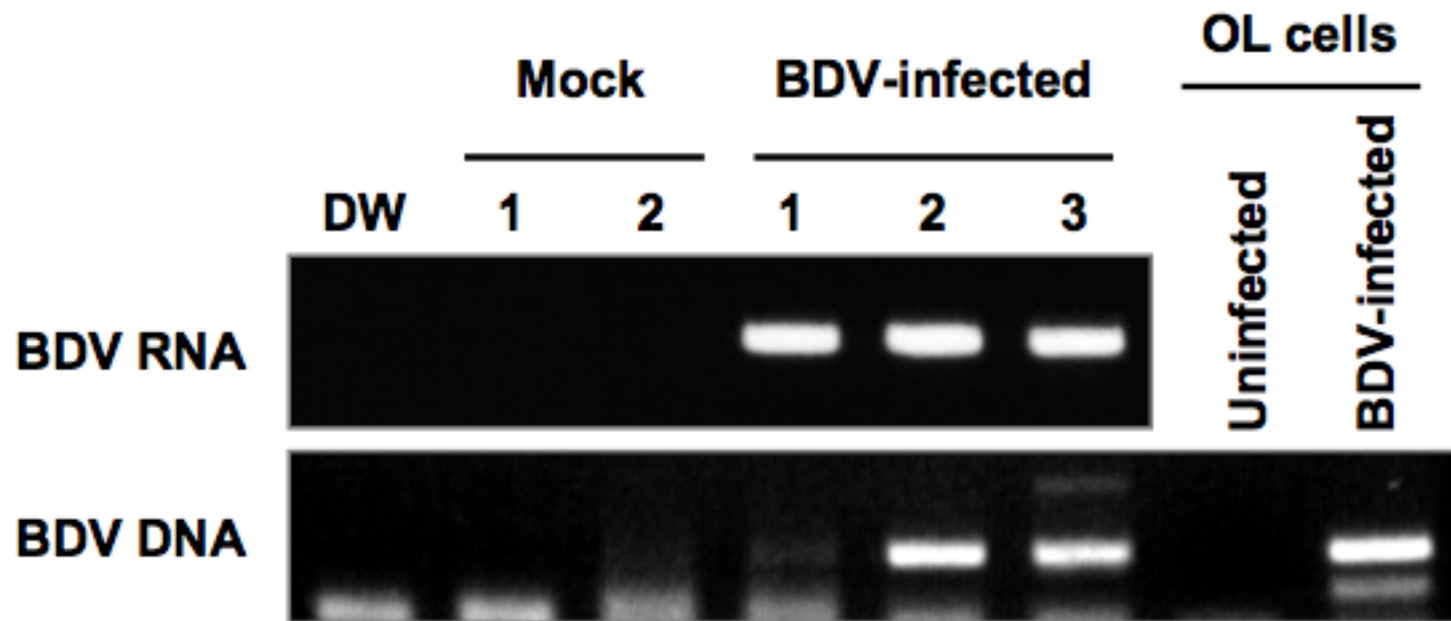
HMGB1: a Two-edged Sword

Anti-viral
responses



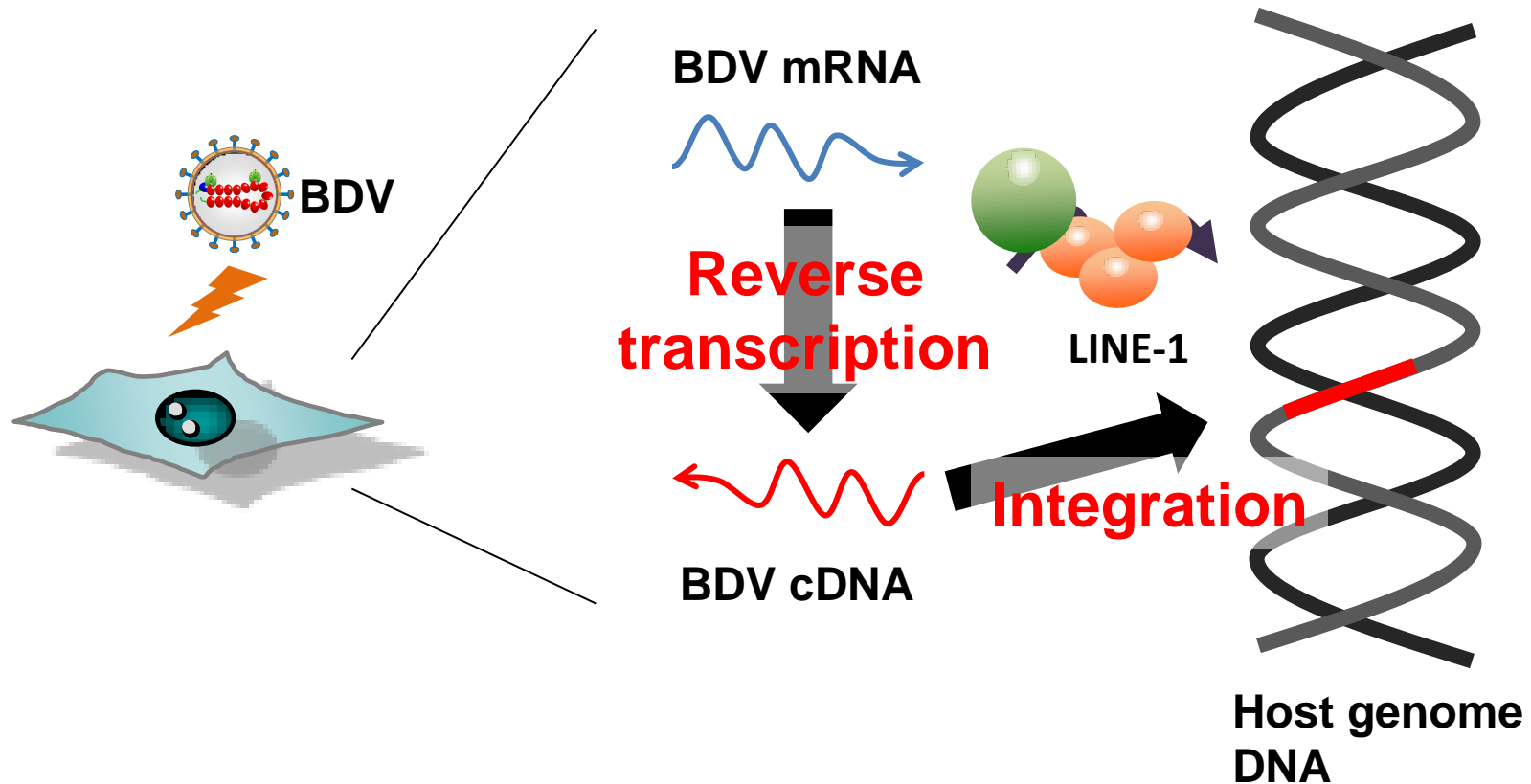
Replication

BDV DNA Formation in BDV-infected Brains



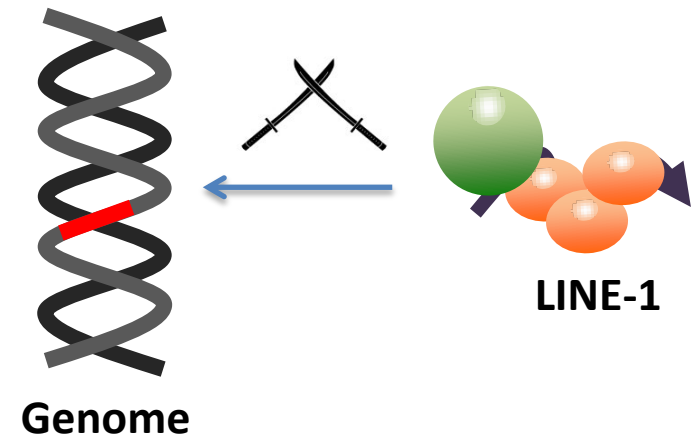
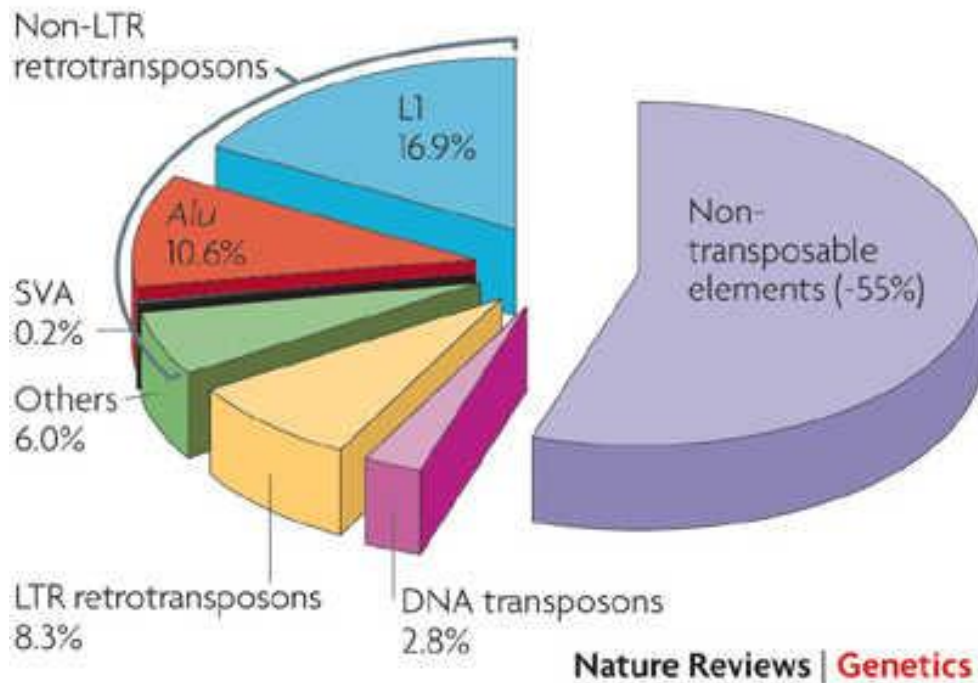
(Horie, Honda *et al.*, *Nature* 2010)

BDV DNA Formation in BDV-infected Brains



(Horie, Honda *et al.*, *Nature* 2010)

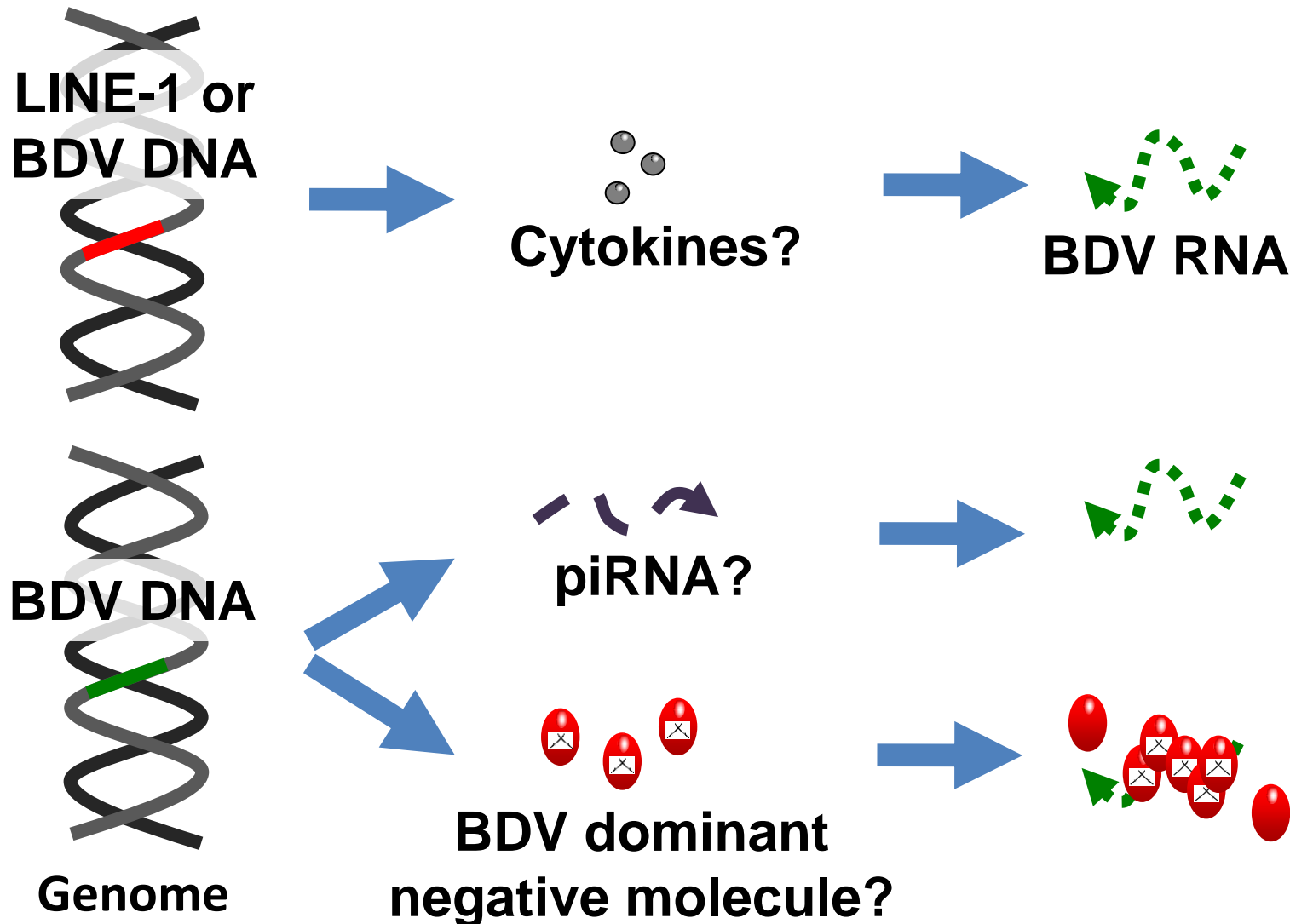
LINE-1: Friend or Foe?



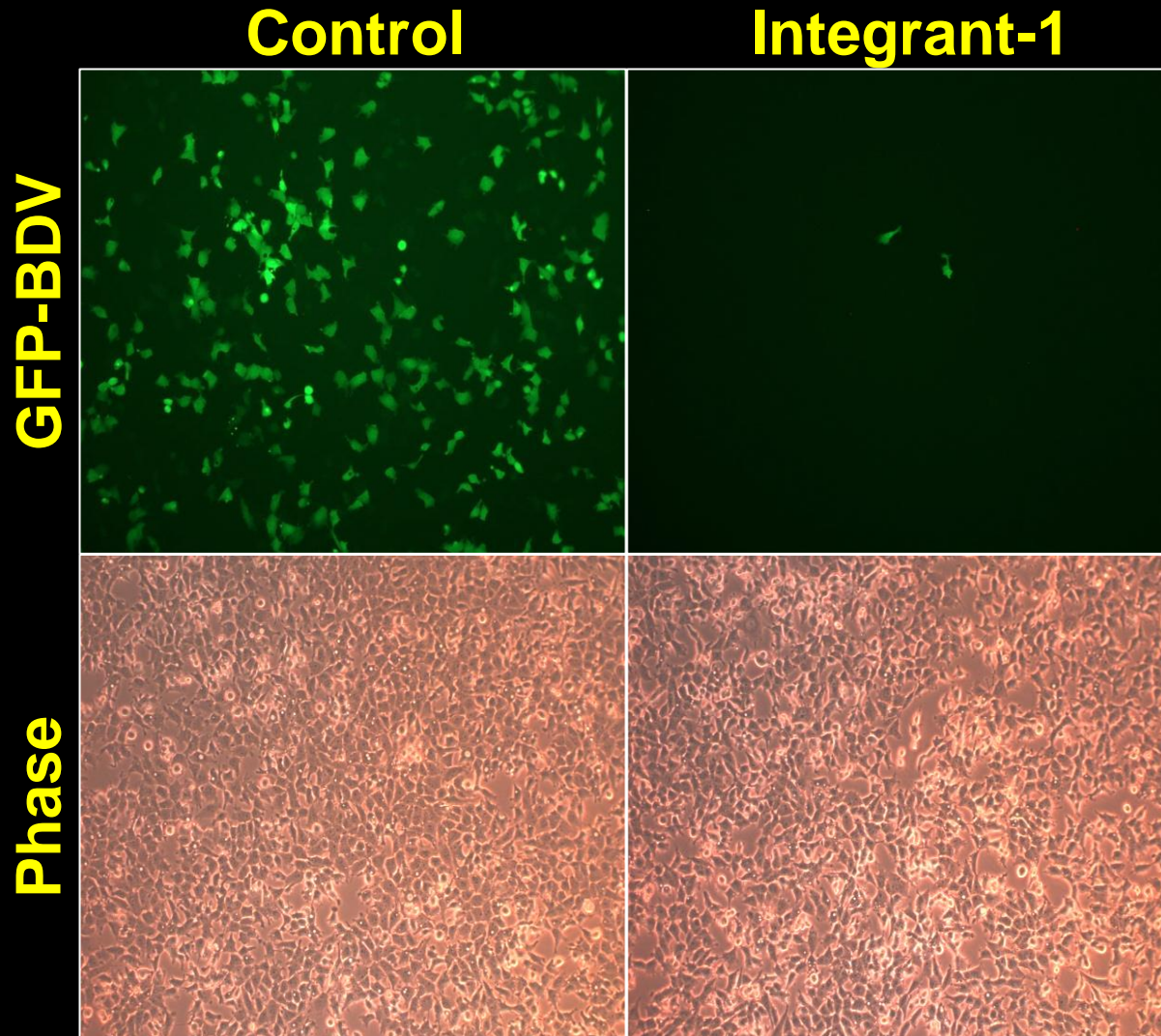
- Mutation
- Gene disruption
- Genome instability

(Cordaux *et al.*, *Nat Rev Genetics* 2009)

Working Hypothesis of Anti-BDV State



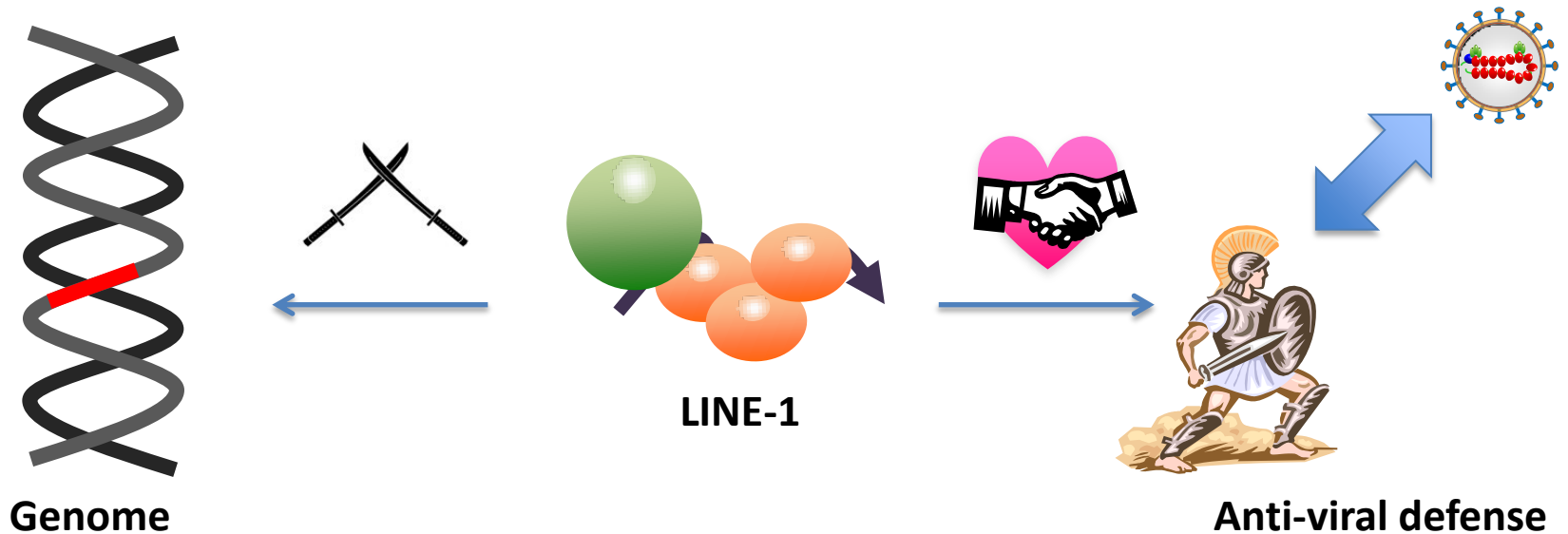
Suppression of BDV Spread by Expression of BDV Integrant



(Fujino *et al.*, *PNAS* 2014)

Summary 3

@ Retrotransposons: more than enemy



Acknowledgments

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