

Role of the novel checkpoint regulator TRIM29 in controlling allergic asthma

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Host-Pathogen Battles



“bad guys” invade human body:

RNA viruses
DNA viruses
bacteria
allergen



Xing *et al.*, J Virology, 2012, 86(7): 3528-40
Xing *et al.*, J Virology, 2013, 87(17): 9788-801
Xing *et al.*, J Virology, 2015, 89(5): 2944-55
Xing *et al.*, J Virology, 2015, 89(24): 12513-7

Who will find “bad guys”?

Immune cells

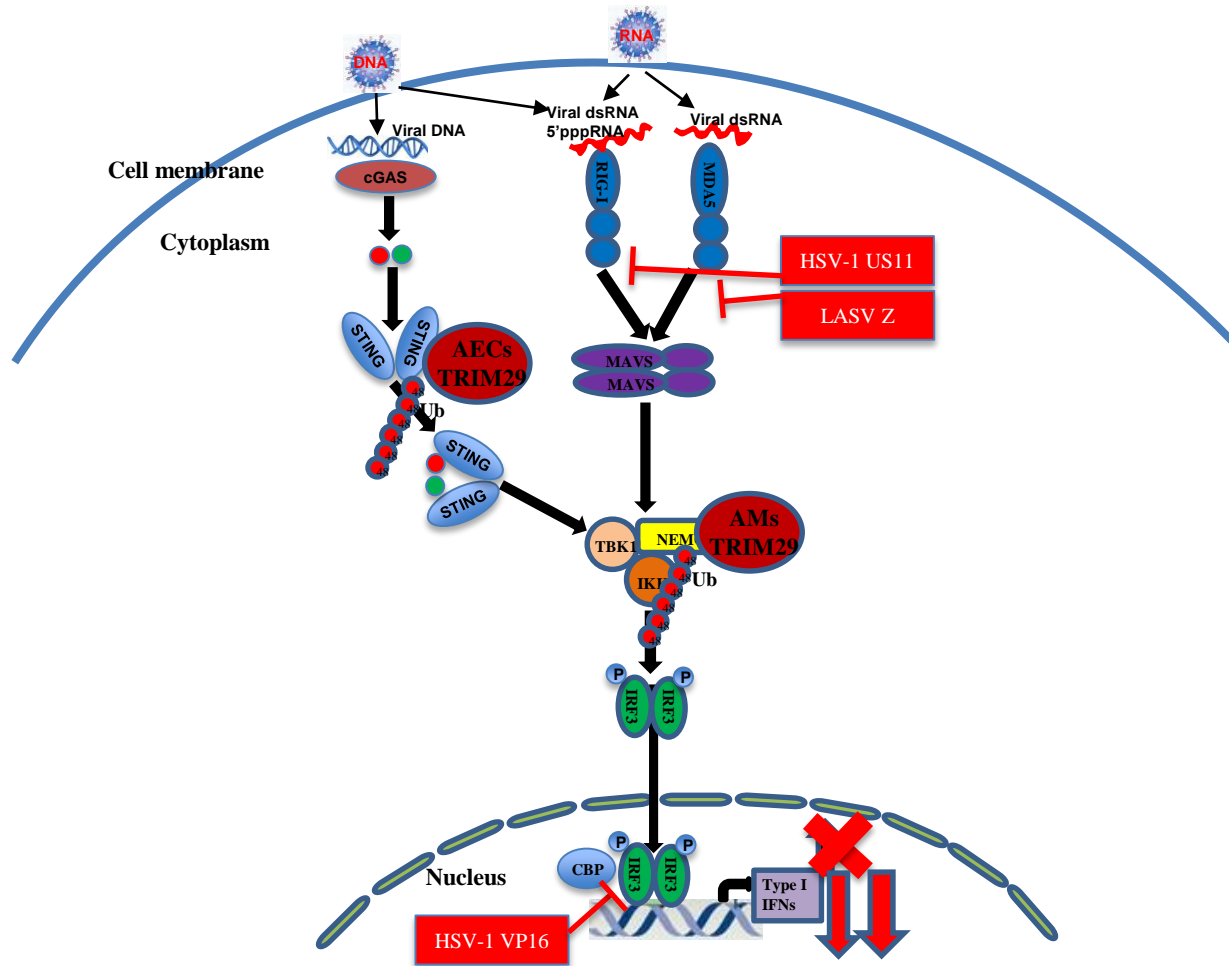
How to kill “bad guys”?

to produce IFN and cytokines
to create antibodies
to create toxic granules
to destroy infected cells



Xing *et al.*, Nat Immunol, 2016, 17(12): 1373-80
Xing *et al.*, Nat Commun, 2017, 8(1): 945
Xing *et al.*, J Immunol, 2018, 201(1): 183-192
Xing *et al.*, J Immunol, 2010, 185(9): 5074-81

Interactions of host innate immunity and viruses

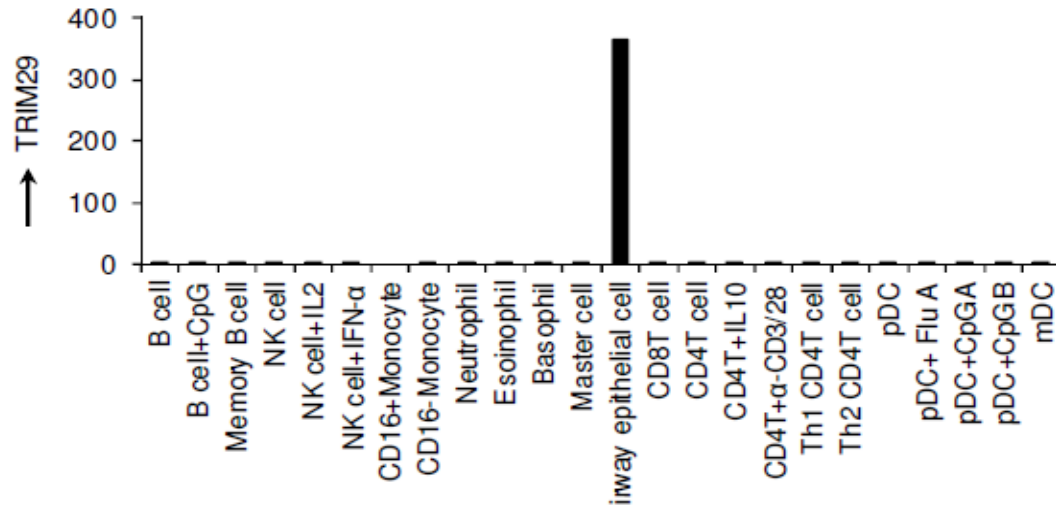


Xing *et al.*, Nat Immunol, 2016, 17(12): 1373-80

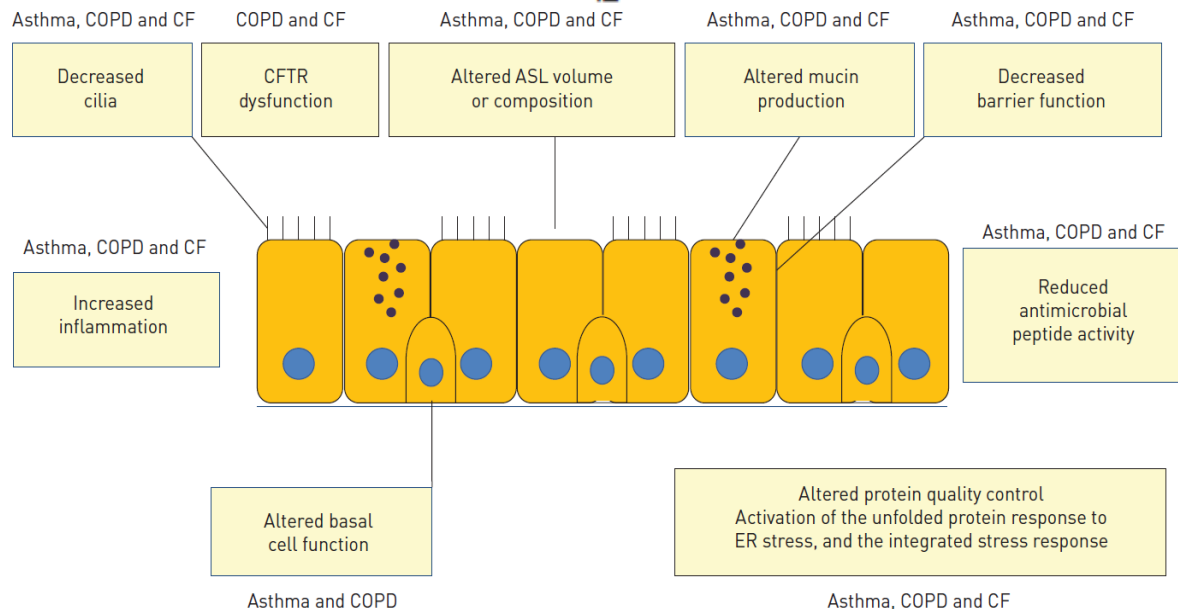
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TRIM29 is highly expressed in human airway epithelial cells



Xing *et al.*, Nat Commun, 2017, 8(1): 945



AECs dysfunction in asthma

Eur Respir J., 2015;45(4):1150-62

**What is the role of the novel checkpoint regulator
TRIM29 in respiratory allergic diseases?**

TRIM29 is downregulated in the lung from asthma patients

RNA from lung tissue of healthy donor or asthma patient

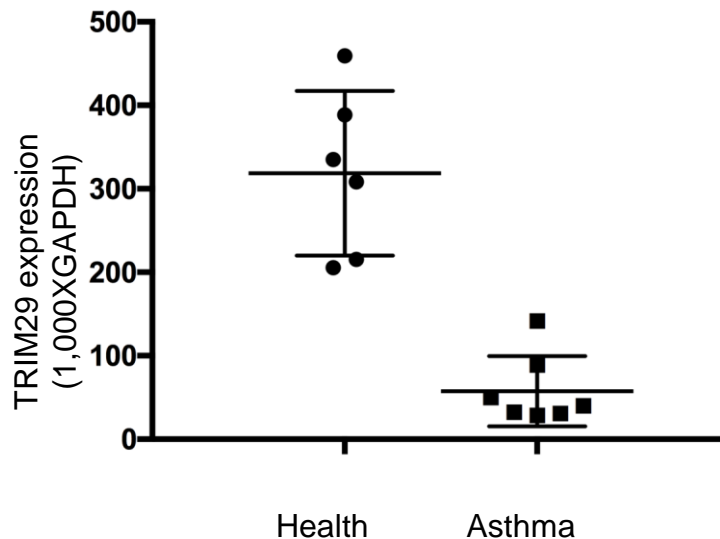


cDNA by reverse transcript

Lu *et al.*, Nat Commun, 2018, 9(1): 742



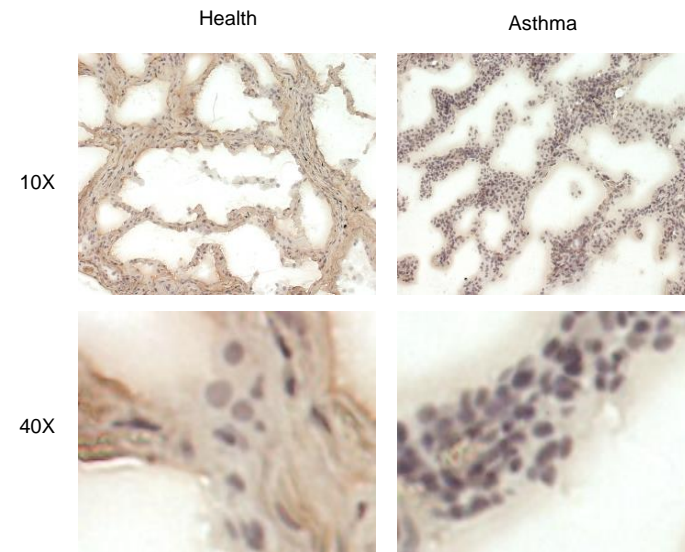
Q-PCR analysis for TRIM29 expression in RNA level



Human health and asthma lung tissue sections (BioChain Institute Inc.)

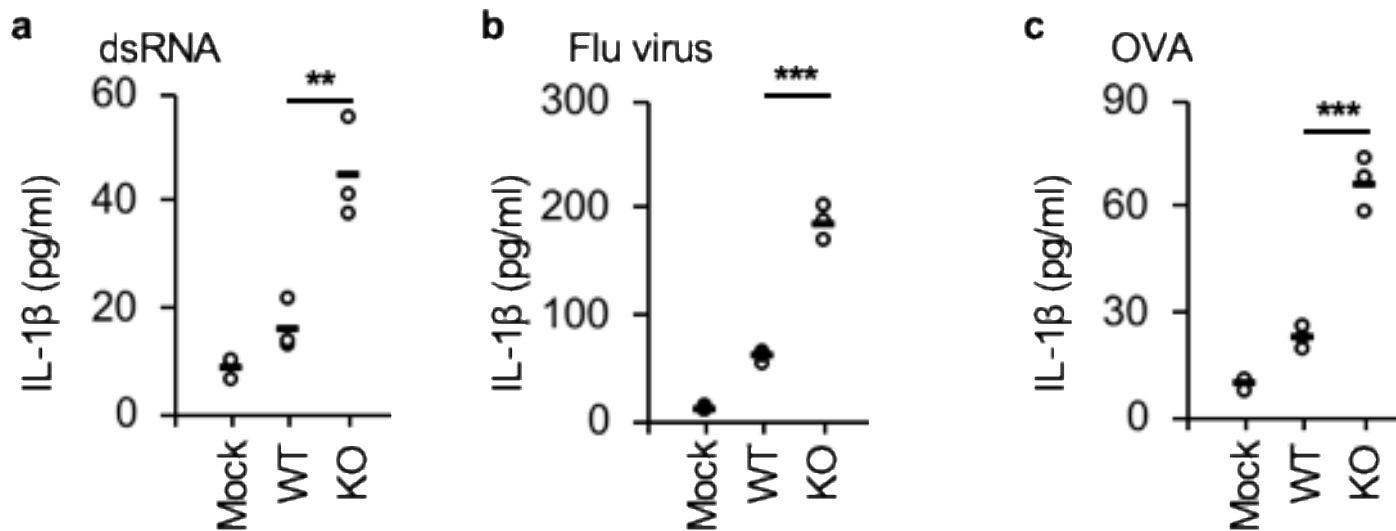


Immunohistochemistry (IHC) analysis for TRIM29 expression in protein level



TRIM29 negatively regulates the inflammasome activation in AECs

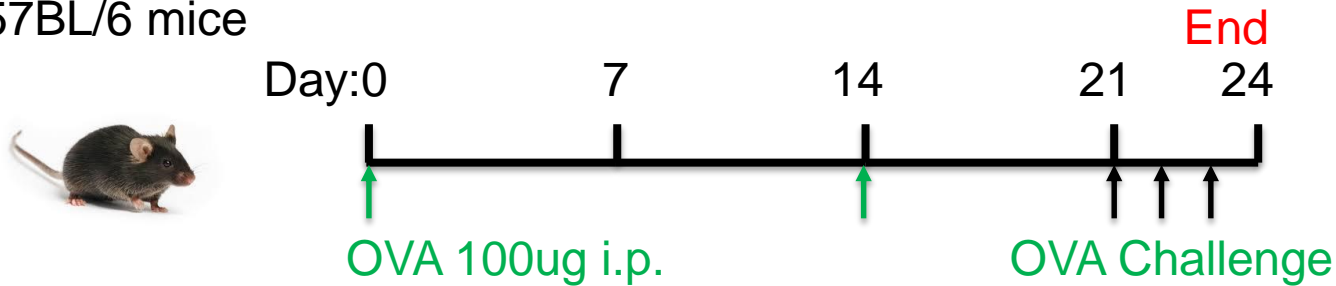
Isolation of WT and T29 KO AECs → Stimulate cells with dsRNA, Flu virus or OVA → ELISA analysis of supernatants



AEC: airway epithelial cells
dsRNA: poly I:C
Flu virus: influenza PR8 virus
OVA: ovalbumin

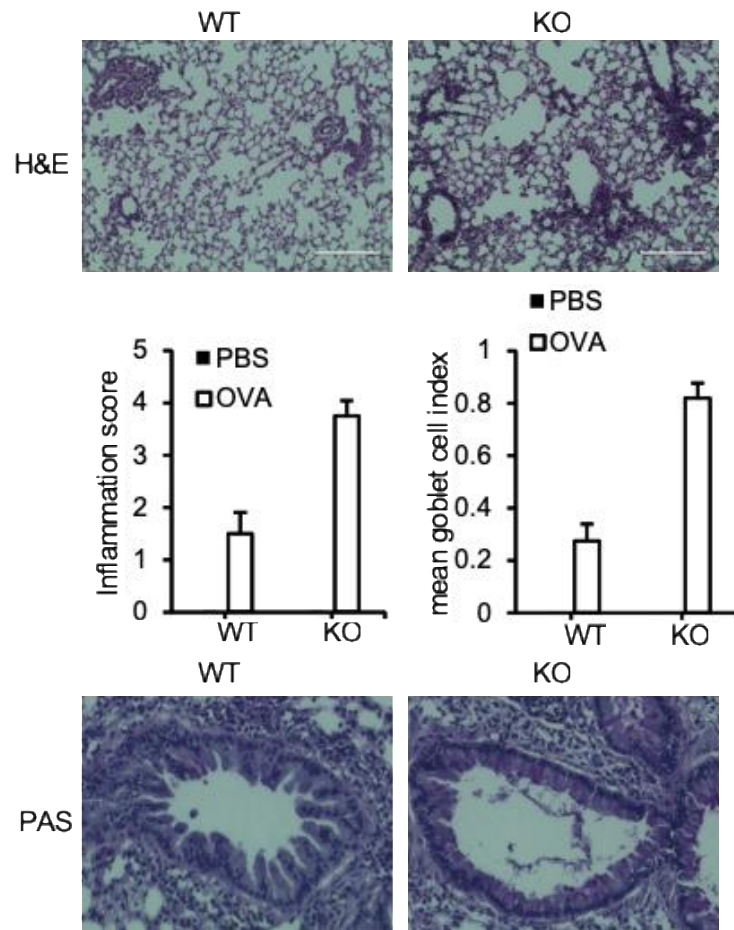
OVA-induced asthma model in mice

WT and T29 KO
C57BL/6 mice

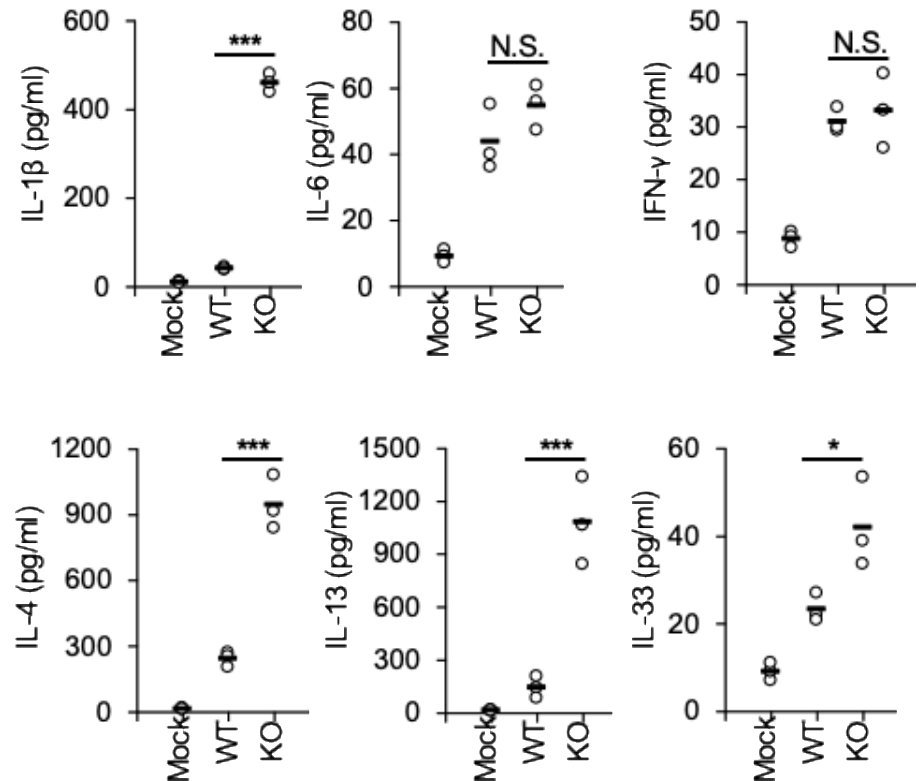


1. Histology analysis of lung: H&E and PAS staining
2. ELISA analysis of cytokines released in bronchoalveolar lavage fluid (BALF)

Knockout of TRIM29 shows more severe lung inflammation



BALF: bronchoalveolar lavage fluid



Conclusions

1. TRIM29 is significantly downregulated in the lung from asthma patients
2. TRIM29 negatively regulates the inflammasome activation in AECs
3. Knockout of TRIM29 shows more severe lung inflammation in OVA-induced asthma model mice

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Thank you for
your kindly attention!

