Regulatory effects of RNAi uses in food in the Covid-19 world?

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Q: Now with RNA vaccines and more people knowing the word RNA, might this affect the view of the use in agriculture and food production?

Hazard/Risk of RNAi uses in food

- Perception of hazard
- Risk communication.

RNA vaccine: Potential positive effects

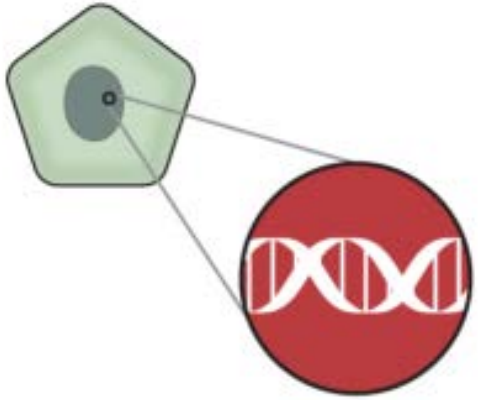
- RNA can be useful

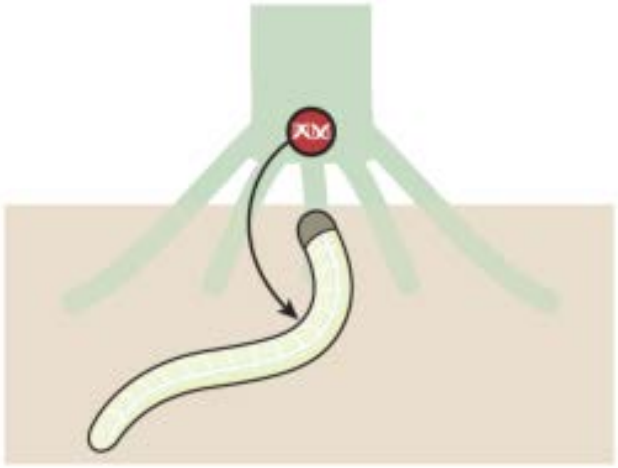
RNA vaccine: Potential negative effects

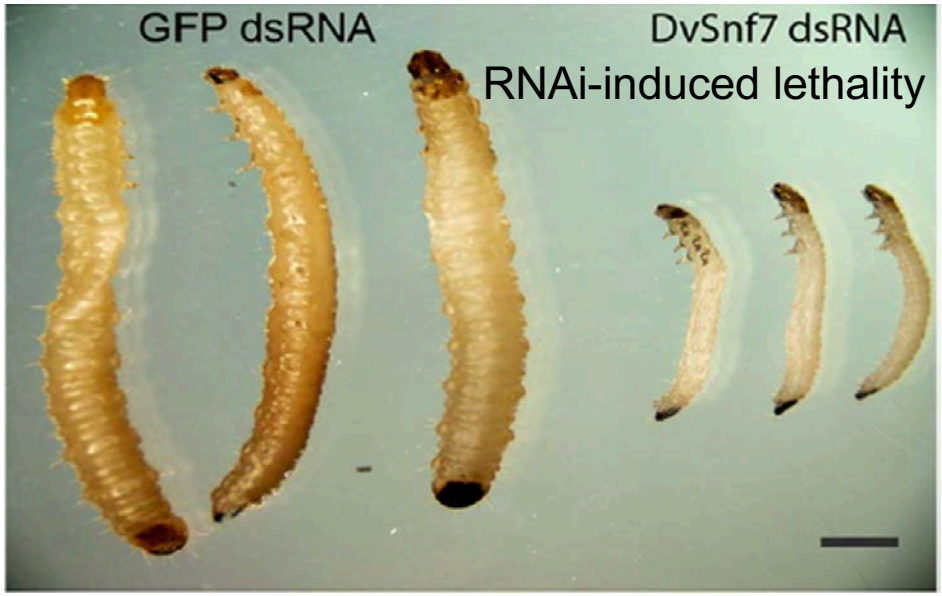
- RNA induces biological effects
- RNA may lead to expression of peptides/proteins
- RNA may lead to expression of antigens and/or allergens.

siRNA against corn rootworm

DvSnf7, *Diabrotica virgifera* Sucrose non-fermenting, a vacuolar sorting protein

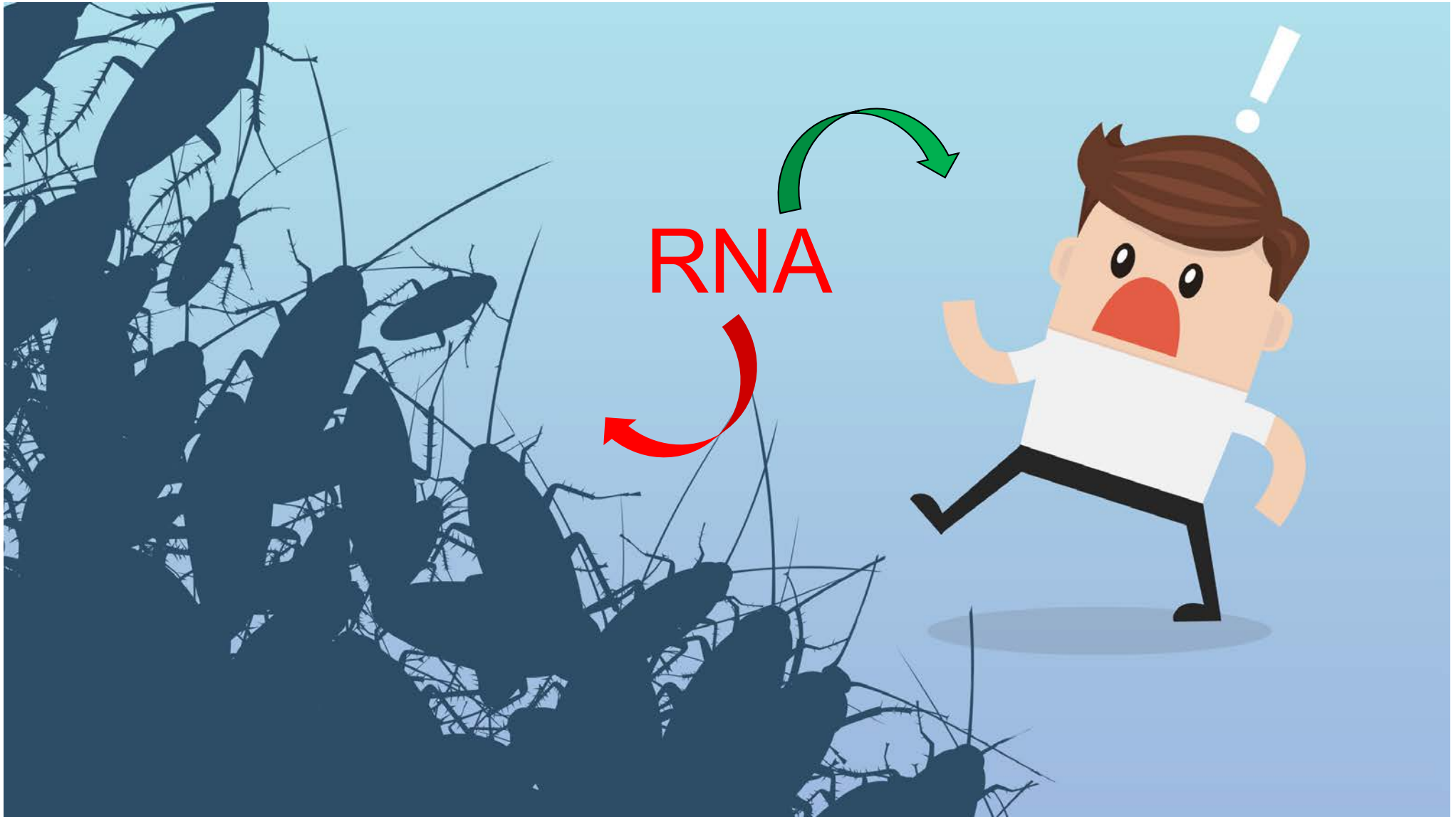






Baum et al. (2007) Nat. Biotechnol. 25, 1322-2

New hazard?



Hazard/Risk of RNAi plant uses food

- Hazard: Impossible to exclude based solely on the sequence
- Risk: It is highly unlikely that RNA & derived siRNAs newly expressed in plants (or animals) are able to exert any biological effects once orally ingested.

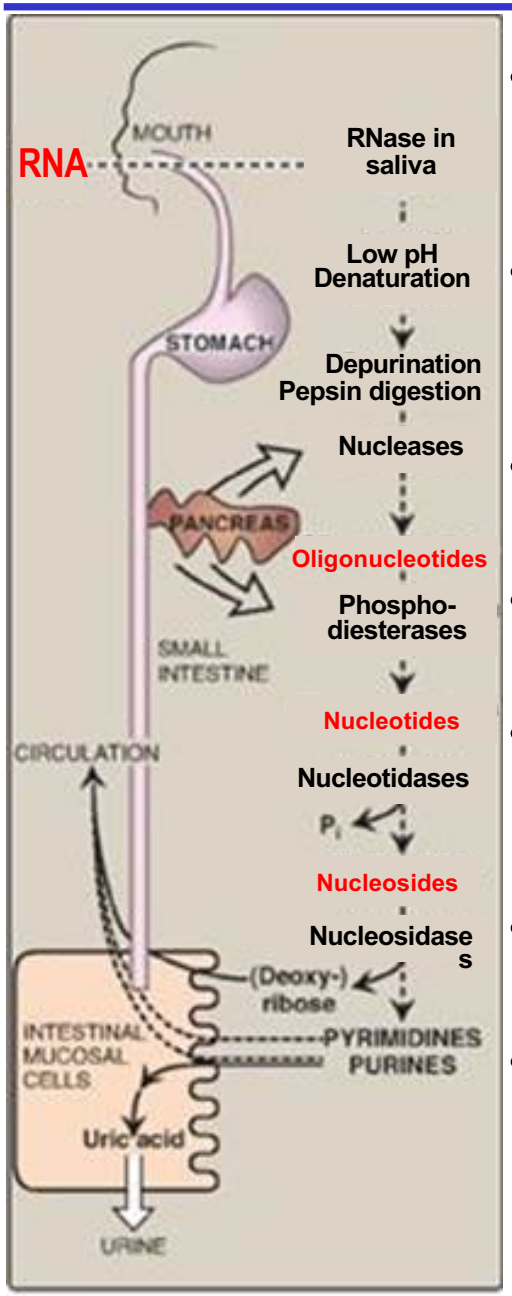
Conclusion

Q: Now with RNA vaccines and more people knowing the word RNA, might this affect the view of the use in agriculture and food production?

A: Possibly yes

– Negative effects on hazard perception for products that provide no direct advantage to the consumer
– Positive effects on hazard perception for products that, like vaccines, do provide a direct advantage to the consumer

Appendix: Risk assessment of DvSnf7 RNA



- Non-coding RNA is ubiquitous in sources (plants, animals) used for food and feed and, hence, represent normal constituents of human and animal diets
- Dietary non-coding RNAs with sequence identity to human/animal transcripts have been consumed safely over thousands of years
- DvSnf7 RNA is a very minor fraction of the total non-coding RNA in maize
- RNA is rapidly denatured & degraded after oral ingestion due to conditions & enzymes in the gastrointestinal tract
- Physical barriers (mucus, cell membranes, endosomal sequestration, lysosomal degradation) limit the uptake of the remaining RNA in the gastrointestinal tract
- The amount of RNA transferred locally into cells or systemically into the blood after oral ingestion is negligible
- It is highly unlikely that DvSnf7 dsRNA & derived siRNAs are able to exert any biological effects once ingested by vertebrates.

EFSA GMO Panel, EFSA J. 2018;16:5310