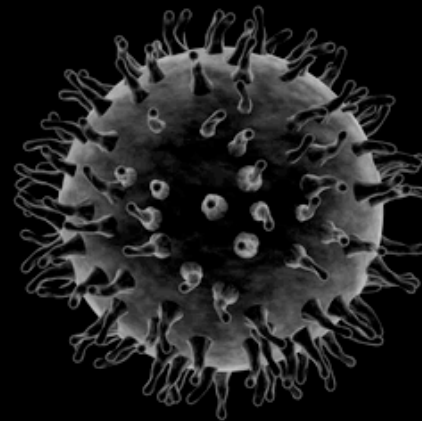


MIRios

Benjamin tenOever, PhD
Mount Sinai School of Medicine



“Our mission is to develop novel influenza virus vaccines for epidemic and pandemic influenza through innovative research and development.”

Influenza Overview

Seasonal Influenza

- One billion cases per year worldwide
- 36,000 deaths (90% elderly and chronically ill)
- 200,000 hospitalization
- 20 million respiratory illnesses
- 250 million flu related sick days
- Economic cost of \$12 billion

Pandemic Influenza

- Past three pandemics resulted in >100 million lives
- Economic cost estimated at \$500 billion



Market Overview

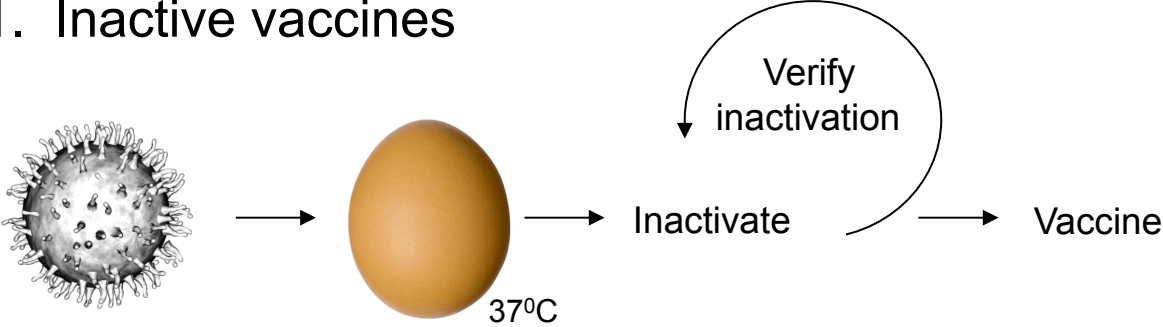
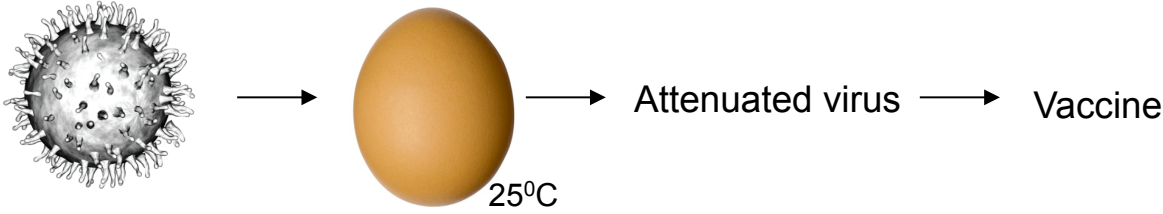
- \$3.7 billion by 2010, expected 20% CAGR from 2004
- Over 90% of flu vaccines are trivalent inactivated influenza vaccine (TIV) versus live attenuated influenza vaccine (LAIV)
- While LAIV has many advantages over TIV, market penetration has been difficult primarily due to pricing

Market Drivers

- Aging world population
- Risk of pandemic flu
- Increased awareness



Introduction to present vaccine strategies

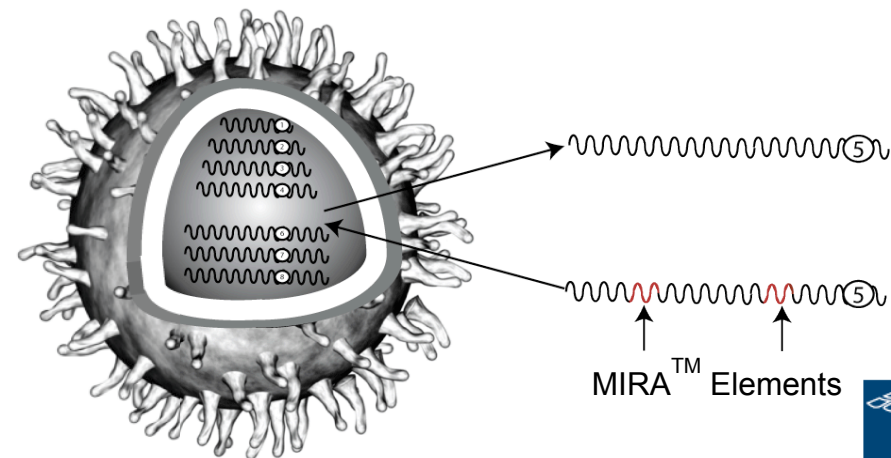
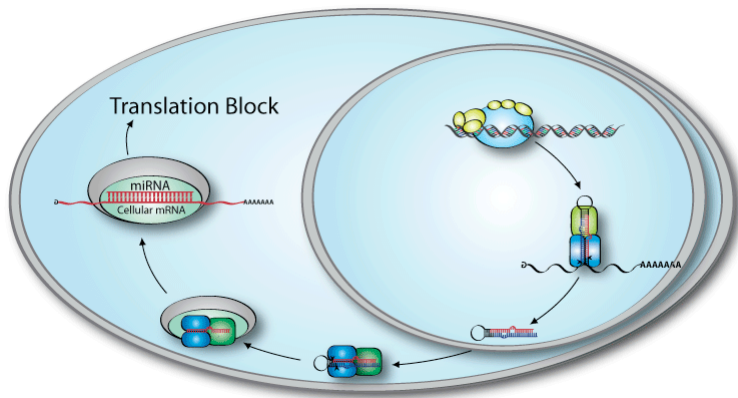
1. Inactive vaccines	Pros	Cons
 <p>37°C</p> <p>Inactivate</p> <p>Verify inactivation</p> <p>Vaccine</p>	<ul style="list-style-type: none"> •Safe 	<ul style="list-style-type: none"> •Slow •Poor response •Low Yield •Insufficient for pandemics
 <p>25°C</p> <p>Attenuated virus</p> <p>Vaccine</p>	<ul style="list-style-type: none"> •Safe •Rapid production •Good response 	<ul style="list-style-type: none"> •Low yield •Insufficient for pandemics

Can we do better?



MIRA™ (MicroRNA Attenuation) Technology

- microRNAs are naturally occurring small RNAs which regulate gene expression by binding to complementary target sequences.
- There are more than 400 different microRNAs in mammals; some of which are absent in avian species.
- MIRA utilizes incorporation of select microRNA target sequences to generate virus strains that demonstrate species-specific attenuation.



FluMira™: the next generation of LAIV

- All of the advantages of present LAIV technologies.
- Amenable to customized attenuation (copy#, species specificity).
- Easily adapted to a cell-based system.
- More cost effective than cold-adapted LAIV.
- More pandemic-ready, technology.



FluMira™ – Development Plan

