

# Semisynthetic artemisinin

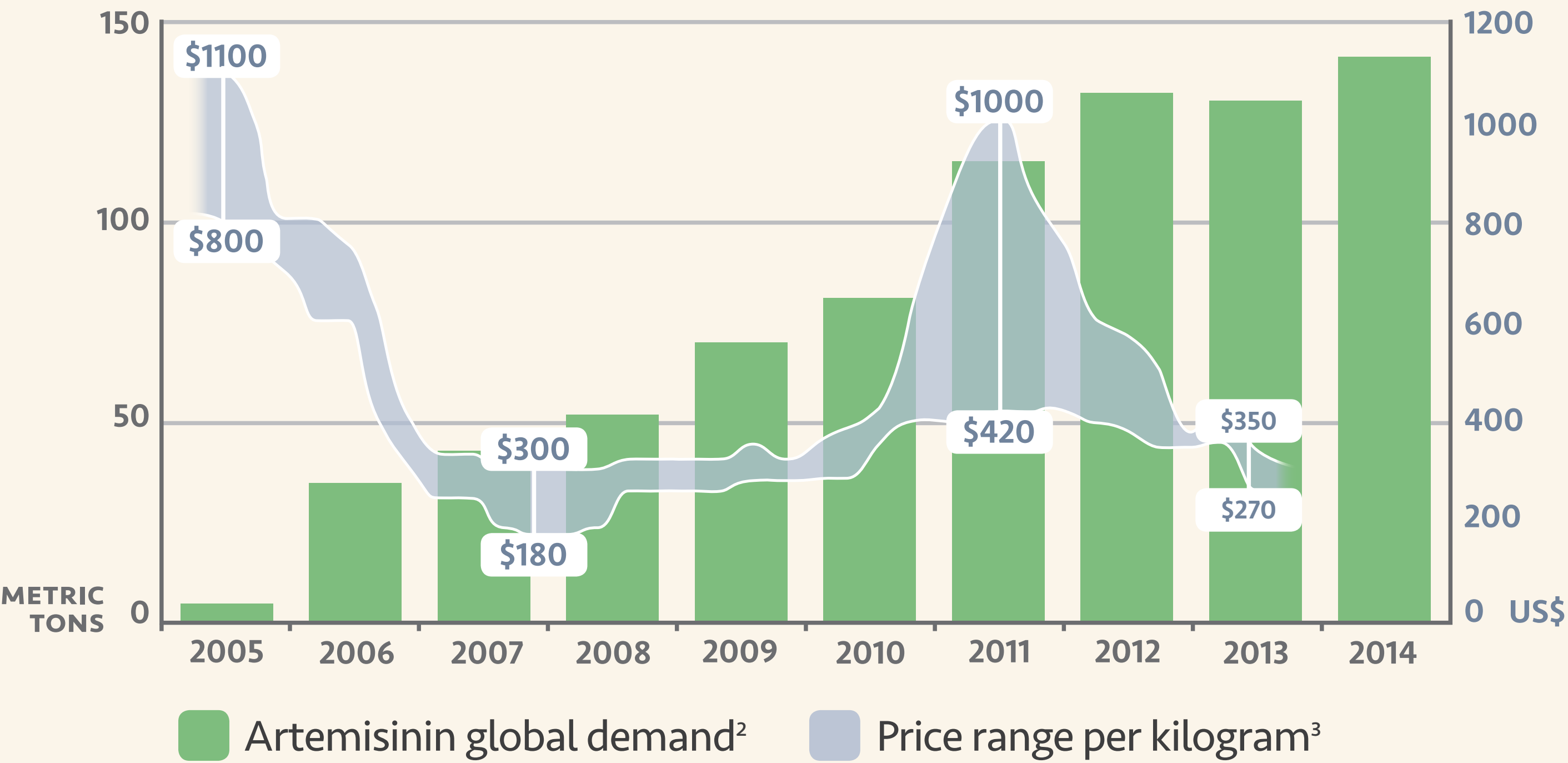
Cross-sector partnership to stabilize the antimalarial drug supply

## MALARIA

sickens more than 200,000,000 and kills more than 620,000 people each year, most of them children under five in sub-Saharan Africa. Malaria can be effectively prevented, diagnosed, and treated using a combination of available tools.

The World Health Organization (WHO) recommends **artemisinin-based combination therapies (ACTs)** as the first-line treatment for infection with the most deadly form of malaria. Globally, demand for ACT treatments has increased exponentially, jumping from 11.2 million courses in 2005 to 331 million in 2012.<sup>1</sup> **Artemisinin** is the starting material for synthesis of major active pharmaceutical ingredients used in ACTs.

MARKET FOR ARTEMISININ (2005–2014)  
Fluctuating prices complicate supply planning

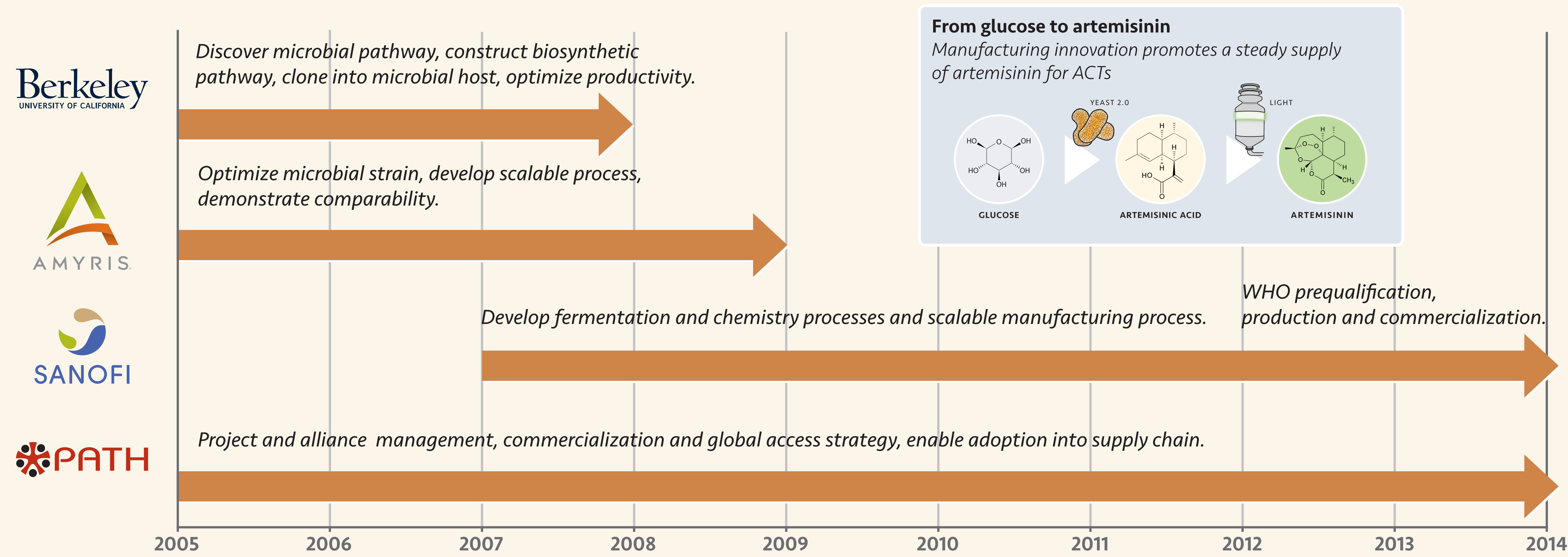


The world's supply of artemisinin, currently derived from the sweet wormwood plant, *Artemisia annua*, is volatile due to a number of factors, resulting in price volatility and periodic shortages.

## PUBLIC-PRIVATE PARTNERSHIP

helps stabilize the artemisinin supply chain and prevent future shortages.

With funding from the Bill & Melinda Gates Foundation, partners set out to develop a new pharmaceutical manufacturing process to produce commercial volumes of high quality, non-seasonal, and affordable artemisinin to supplement the plant-based supply.



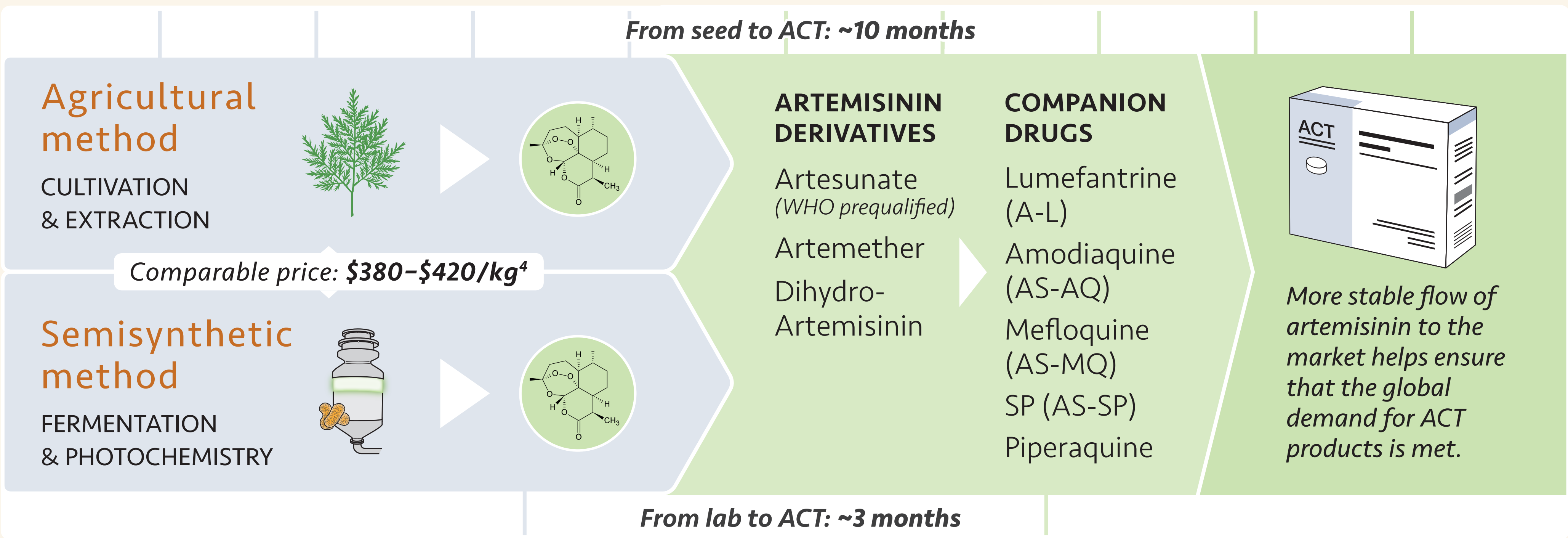
## FROM THE LAB TO THE FACTORY FLOOR

Commercial production launched at Sanofi's plant in April 2013.

**WHO prequalification** for semisynthetic artemisinin and artesunate achieved in May 2013.

**2014 production capacity** = 50–60 metric tons per year (1/3 of the global need).

**First drug manufactured** with semisynthetic artemisinin intermediate, expected to enter market in 2014.



1. World Malaria Report 2013. World Health Organization website. Available at: [http://www.who.int/malaria/publications/world\\_malaria\\_report\\_2013/en/](http://www.who.int/malaria/publications/world_malaria_report_2013/en/). Accessed April 14, 2014.

2. According to an email from Neel Lakhani, Clinton Health Access Initiative (April 2014).

3. Artemisinin imports into India. A2S2 website. Available at: <http://www.a2s2.org/market-data/artemisinin-imports-into-india.html>. Accessed April 14, 2014.

4. Current cost of semisynthetic artemisinin at \$380 to \$420/kg is comparable to the historical average cost of high quality botanical production.